



**UNIVERSITY OF  
CAMBRIDGE**

Department of Veterinary  
Medicine

**University of Cambridge  
Department of Veterinary Medicine**

**Self-Evaluation Report**

**Prepared for the joint visit of  
The Royal College of Veterinary Surgeons  
and  
The European Association of Establishments for Veterinary  
Education**

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## INTRODUCTION

The University of Cambridge Department of Veterinary Medicine (the Department) is unique amongst the UK Veterinary Schools in providing a six-year undergraduate course. In the first two preclinical years of the course (Years 1 and 2), students study for the Medical and Veterinary Sciences Tripos Part IA and Part IB, and sit both University (Tripos) examinations and veterinary qualifying examinations (2nd Vet MB examinations). In the third preclinical year (Year 3), students study a Tripos Part II in a subject of their choice, and upon successful completion of the Part II Tripos examinations are awarded a BA (Hons) degree. This is followed by the three-year clinical course (Years 4, 5 and 6), and successful completion of the examinations for the clinical course (Final Vet MB examinations) leads to the award of the degree of Bachelor of Veterinary Medicine (Vet MB).

The preclinical veterinary course in Years 1 and 2 is provided by a number of Departments in the Faculty of Biology, and clinical education in Years 4, 5 and 6 is provided by the Department of Veterinary Medicine, and both parts of the course are under the oversight of the Veterinary Education Committee. The preclinical and clinical sections of the course are complementary, and are closely managed and monitored in order to provide a co-ordinated and objective-driven veterinary education consistent with requirements for day one competences and for registration with the Royal College of Veterinary Surgeons.

The last Visitation to the Department by the Royal College of Veterinary Surgeons and EAEVE took place in 2008. Since that time, the course has been evaluated by the University's General Board by a Learning and Teaching Review in 2013.

### **Organisational changes**

The period since 2008 has continued to be one of refinement and improvement in the management, content and delivery of the course. The general organisational structure for veterinary education in the University of Cambridge and the context in which it operates (see Chapter 2) remain unchanged.

### **Significant changes since the last Visitation include:**

- the introduction of a new simplified committee structure
- recognition of the Department's initiatives to support female academic and research staff in the form of an Athena SWAN Bronze award (2013) and significant progress in taking forward an action plan arising from this with a view to submission for a Silver Award
- introduction of a programme of staff training for learning and teaching purposes
- Substantial investment in IT facilities and support within the Department since 2013
- Introduction of 40-week final year from July 2014
- Expansion of student skills learning opportunities through provision of Clinical Skills Centre

## **New regulations regarding teaching**

Significant changes to the Regulations surrounding the award of the Vet MB degree include:

- Introduction of a Medical and Veterinary Student Progress Panel to support students in difficulty and to ensure parity of treatment for students requesting additional attempts at examination
- Introduction of the (related) Fitness to Practice regulations

As a result of new requirements from RCVS, we have revised our course to remain compliant in relation to

- Extramural studies (see SER 1 Chapter 14)
- Day 1 competencies
- The introduction of Fitness to Practice requirements for students
- The requirement for disclosure of convictions, cautions or other adverse findings on an annual basis including first joining the Register (also covered later in SER1 and SER2).

## **New buildings and major items of equipment**

The Department is situated on the University's West Cambridge site, where a large-scale development of science and technology research facilities and infrastructure is underway.

The main achievements of the Department since 2008 in terms of buildings are:

- A new Student Resources Centre
- Cancer treatment extension: building new bunker for the linear accelerator
- Rebuild and refurbishment of Small Animal clinical facilities, including:
  - Marguerite Price Consulting Wing,
  - new pharmacy,
  - clinical research laboratory area,
  - new Senior Clinical Training Scholar office provision
  - two new seminar rooms
- Pauline Brown Clinical Skills Centre, embedded within Small Animal Hospital
- New build clinical pathology laboratory, integrated with clinical areas
- Refurbishment of Equine Diagnostic Unit into modern functional facilities (ongoing in 2015)
- New sheep farm and lambing facilities at University Farm at Madingley
- New dairy farm young stock and dry cow and heifer buildings at University Farm at Madingley
- Refurbishment of laboratory space for the Reader in Comparative Oncology

In addition to the above, there is an ongoing programme of refurbishment of teaching facilities in the School of the Biological Sciences, including new Pathology teaching laboratories and the refurbishment of the Department of Genetics.

The main equipment purchases since 2008 are:

- Digital subtractive angiography equipment
- MRI Grande (machine upgrade)
- Digital imaging for student teaching
- Second small animal ultrasound machine
- Digitiser in small animal theatre
- New laboratory information management system for Clinical Pathology
- Theatre autoclave
- New Linear Accelerator Facility
- Provision of CT facility via Cambridge Radiology Referrals
- Operating table in equine theatre
- Laser surgical equipment
- New endoscopic equipment
- Two ultrasound machines in farm animal for rectal examination
- Haptic devices for Clinical Skills Centre
- AU 400 chemistry analyser in Clinical Pathology
- Sysmex veterinary haematology analyser in Clinical Pathology
- Automatic slide stainer in Clinical Pathology
- Gel scanner in Clinical Pathology
- Becton Dickinson BD Accuri C6 Flow Cytometer (FACS) in Clinical Pathology

We have not included purchases of equipment used for research purposes in this list.

### **Main changes to the study programme**

Most major changes to the study programme (curriculum) require an amendment of the Regulations governing the award of the Vet MB degree, and these are dealt with above.

The constant challenge to any study programme for veterinary medicine is that of providing a curriculum that supplies the basic core knowledge and practical experience for the discipline, whilst simultaneously adapting to changing demands in the face of a continuing expansion in veterinary understanding and skills.

Since the last internal curriculum review in 2012, we have improved the delivery of teaching in

- microbiology, parasitology through streamlined courses and transfer of material to the systems and species courses (to improve contextualisation)
- animal husbandry and management through restructuring the Principles of Animal Management course (1<sup>st</sup> year) and co-ordinating it with the new Integrated Animal Management course (4<sup>th</sup> year)
- the Preparing for the Veterinary Profession course through refocusing the course

- repositioning the Clinical Pathology course from 5<sup>th</sup> year to Michaelmas Term of 4<sup>th</sup> year, to aid students on their first clinical EMS placements
- moving and refocusing introductory courses in clinical disciplines (e.g. Principles of Surgery, Principles of Anaesthesia) to Michaelmas Term of 4<sup>th</sup> year, with an integrated assessment (Principles of Clinical Practice), to aid students on their first clinical EMS placements,
- clinical practical skills through the provision of a Clinical Skills Centre
- veterinary public health through strategic appointments
- final year rotations through the introduction of a 40-week final year with smaller group sizes, increasing the ambulatory equine and farm animal practices and the introduction of a new Emergency Critical Care rotation.

The philosophy of the course is to provide a core curriculum emphasising veterinary scientific principles, and to encourage students to use and apply this knowledge to new problems and situations as they arise.

In order to achieve this, teaching is progressively problem-based from Year 1 onwards. A good foundation of knowledge acquisition is, however, recognised to be essential, and in the context of relatively short academic terms some basic knowledge has to be selectively provided directly to the student. Practical and clinical assessments are designed to test core knowledge and the ability to integrate and apply knowledge in a professional context.

We believe that variety in teaching and learning is highly desirable and staff are encouraged to develop a variety of teaching methods, making use of computer-aided learning (CAL) as appropriate, as well as directed self-learning both in the formal context of assignments and electives, and in small group teaching and clinical work. The ethos of self-learning which begins in the preclinical course thus feeds into the clinical course, and later into continuing professional development after graduation.

We appreciate that change needs to be monitored, and in some cases time needs to be taken to introduce new methods and approaches. We believe that our teaching should constantly evolve, but in a controlled and structured fashion that takes into account the need to equip students with the day one competences, and to address the developing needs of the profession in the UK.

### **Important decisions made by the management of the Department**

Recent major decisions made by the senior management of the Department include:

- Changes to the committee structure of the Department
- Introduction of a rolling Strategic Plan for the Department
- Changes to the curriculum, including:
  - Development of a Professionalism and Clinical Practice strand to run through all six years of the course and with a portfolio-style of assessments;
  - harnessing current teaching but with improved integration/co-ordination and more formal assessment of generic and practical skills;

- restructuring of Final VetMB Examinations Part I modular exams to improve blueprinting the assessment against the lecture/practical content, combining individual examinations on only a few lectures to a consolidated examination
- Subject course reviews with external members on the review panel (farm animal teaching will be the first one, then equine?)
- Continued concentration on first opinion small animal teaching at the new RSPCA clinic
- Continued concentration and expansion of first opinion equine practice
- Expansion of first opinion farm animal practice
- Leasing space for CT imaging facility
- Election of a research-active Professor of Equine and Farm Animal Science to oversee and champion these areas
- Election of a research-active Professor of Small Animal Surgery to oversee and champion this area
- The establishment of a Director of Surgery position to provide focused clinical leadership in small animal surgery
- The appointment into Principal Clinical Veterinarian post in Anaesthesia and Critical Care to provide important clinical and teaching leadership in this area, and advertisement of similar posts in Oncology and Neurology
- Continued funding of six Clinical Veterinarian posts (Farm Animal, Equine, Neurology, Diagnostic Imaging, Small Animal Surgery, Oncology), in addition to the existing post of Clinical Anaesthetist, to underpin clinical service provision and teaching in the Hospital
- Succession plan to refocus learning and teaching management responsibilities following retirement of Director of Teaching in 2013, includes introduction of new remits of Deputy Director of Teaching (examinations), Clinical Skills Centre academic lead
- Appointment of a Teaching Fellow Veterinary Public Health (VPH) in November 2014 to support the Senior Lecturer in VPH
- Appointment of a Senior Teaching Associate in Curriculum Design and Innovation to support the Department's teaching initiatives
- Greater emphasis on web communications for internal and external purposes

### **Major problems encountered by the Department**

The main problems encountered by the Department have been or are:

- difficulties in recruitment and retention of qualified veterinary surgeons owing to uncompetitive academic salaries; this is compounded by the high salaries available in private veterinary practice, and is further exacerbated by the pressure on staff to maintain clinical service (including out of hours cover), research and teaching activities. An internal Learning & Teaching Review (2013) recommended that the University's Human Resources Division work with the Department to introduce clinical market supplements and pensionable payment for out-of-hours services; meetings were initiated by the Department in October 2013 but a resolution has yet

to be delivered. The recruitment problem is particularly acute in some clinical areas and results in increased stress and workload for those in small teams. .

- succession planning for future clinical retirements has so far failed to identify funding for future need for academic clinician positions in imaging, and small animal medicine (cardiology, dermatology) and in farm animal medicine.
- maintenance of the necessary breadth in an ever-expanding veterinary curriculum to meet the requirements of day one competences;
- financial constraints as a result of the level of HEFCE funding relative to actual costs of delivering veterinary education, and lack of recognition of the Queen's Veterinary School Hospital as core facility for teaching provision
- poor quality of lecture and teaching room provision; lecture theatres in need of urgent refurbishment in order to provide up-to-date learning and teaching technologies and opportunities for interactive learning

# CHAPTER 1

## OBJECTIVES

### 1.1 Factual information and overall objectives

The Department of Veterinary Medicine at Cambridge is at the forefront of veterinary science and education and is a centre of excellence for teaching and research.

Our mission is to improve the prevention and treatment of diseases of animals by defining and applying best clinical practice, by understanding and developing the science underpinning best practice, and by providing an education programme in the veterinary sciences that is second to none and that delivers the best veterinary practitioners, academics and research scientists.

The aims and objectives for the veterinary course at Cambridge were set out in the self-assessment document provided for the Quality Assurance Agency (QAA) Subject Review visit in 1999.

The aims and objectives were drawn up by the subject review committees, which were sub-committees of the Faculty Boards of Biology and Clinical Veterinary Medicine, following widespread consultation within the Departments responsible for delivering veterinary education, and with reference to the EAEVE guidelines and the Lucke report on veterinary education prepared for the RCVS.

These aims and objectives are still valid, and they address the day one competences required by the RCVS. They are also consistent with the QAA benchmark statement for veterinary science.

A continuous monitoring of the extent to which the Department achieves its aims and objectives is carried out by way of its own quality control procedures (Chapter 5), which are described in the published Learning and Teaching Quality Update for the Department (Appendix 1).

The aims and objectives are under continuous review by the Faculty Boards of Veterinary Medicine and Biology, through the Veterinary Education Committee, the Teaching Strategy Committee, the Teaching Staff Meeting, the Medical and Veterinary Sciences Tripos Committee (MVST I Committee) and the Biological Sciences Committee of the Faculty of Biology, which are all tasked with delivering them.

The QAA requires the ongoing monitoring of teaching by means of a QAA Institutional Audit and the University's own periodic internal review of Departments. The Department conducted its own internal Teaching Review of the curriculum in 2012. An internal University Learning and Teaching Review of the Department took place in February 2013 (Appendix 2), with external membership in the review panel.

The Department will commence a series of external reviews of its individual courses (content and provision) in spring 2015.

The continued monitoring of the aims and objectives undertaken by the RCVS and EAEVE in their periodic Visitations to examine the teaching programme is regarded as highly significant.

### Aims

The Department aims to produce highly motivated and adaptable veterinary graduates, with a desire for continuing education, who are well equipped to embark on a successful career in veterinary practice, bio-medical industry or public service, or in suitable cases to study for higher degrees and to become the academic teachers and researchers of the future.

Specifically it aims:

- To provide a stimulating and challenging learning environment where teaching is informed and enhanced by research to international standards of excellence;
- To provide training in scientific principles, and experience in the evaluation and practice of research;
- To continue to attract outstanding students with an interest in veterinary science, from a variety of backgrounds, developing their potential in order to enable them to contribute fully to the cultural and intellectual base of society;
- To give these students an intellectually stimulating and diverse environment, in which they have the opportunity to develop their vocational and scientific enthusiasms and abilities to the best of their potential;
- To use appropriate and varied methods of teaching (lectures, small-group teaching, laboratory practical work, CAL, clinical practice, project work, extra mural study) and assessment (formative and summative);
- To teach effectively and rigorously, using live animals, the practical skills, techniques and knowledge that are essential to veterinary practice, together with their theoretical framework, and to build vocational instruction intensively on the scientific background provided in the preclinical veterinary course;
- To provide a range of opportunities within the course to enable students to attain day one competences;
- To remain responsive to advances in research, clinical practice and scholarship, and to the future needs of the veterinary profession.

### Objectives of the preclinical course

By the end of the first two years (MVST Part IA and IB) preclinical students should have:

- acquired a knowledge and an understanding of the basic principles and processes of the biological sciences;
- been introduced to common forms of disease and the contribution made by the biological sciences to a basic understanding of them;
- begun to develop observational and deductive skills in associating molecular and cellular events with the outcomes of disease;
- acquired basic laboratory manipulative skills and begun to develop skills in the analysis and interpretation of experimental data;

- acquired an understanding of farming systems and the management and biology of farm animals;
- acquired basic information technology skills in order to search for and to retrieve information;
- begun to develop skills in problem-based learning and in oral and written communication;
- begun to develop skills in dealing with animals;
- become enabled to progress to clinical training;
- been introduced to the spectrum of veterinary professional activity through the Preparing for the Veterinary Profession course;
- been introduced to the veterinary role in protecting Public Health;
- acquired a basic knowledge of animal husbandry.

By the end of the third year (Tripos Part II) students should have:

- an advanced understanding of the core principles and topics of their selected course and its experimental basis;
- a knowledge and an understanding of selected aspects of their chosen subject;
- experience of independent work, and have begun to develop skills in research and experimental design;
- developed skills in critical analysis of arguments and data from research papers ;
- developed skills of reasoned argument in written and oral presentation of scientific investigations and exegesis, and in the use of problem-oriented approaches to contemporary scientific issues in medicine;
- developed skills in the correlation and analysis of diverse information including that derived from electronic databases;
- begun to appreciate that learning is a continuous process.

#### Objectives for Terms 1 - 6 of the clinical course

The objectives of individual components of the clinical course are set out in the Curriculum Document, which is provided for students and staff annually. Students must achieve these objectives by passing all assessed components of the course and attending the associated practical classes.

There are 13 course examinations distributed over the first five terms of the clinical course. These assessments constitute Part I of the Final Vet MB, which must be passed in its entirety before sitting Part II of the Final Vet MB at the end of the sixth term. Part II of the Final Vet MB tests students' ability to recall and synthesise what has been learnt so far, and marks the end of the first level of the clinical course. The overall objectives can therefore be divided into two levels.

On completing the first level of the clinical course, students should have:

- a knowledge of the structure and function of healthy animals, which will allow them to recognise and understand abnormal and diseased states of body systems;
- a sympathetic understanding of the management and nutrition of domesticated animals and of their needs in health and disease;
- a competence in animal handling across a range of species
- a knowledge of the principles and practice of preventive veterinary medicine and veterinary public health;
- basic skills in clinical diagnostic problem-solving, and in formulation of treatment and prevention strategies;
- basic skills in communication;
- a knowledge of reproductive physiology and genetics sufficient to understand breeding management in large and small animals;
- an understanding of the principles underlying the pathology, pathogenesis, diagnosis, epidemiology and control of disease;
- a knowledge of the principles of surgical techniques and a basic competence in a range of surgical skills, theatre practice
- a basic knowledge and interpretation of diagnostic imaging (radiography and ultrasound), and have received a basic introduction to advanced imaging techniques, e.g. MRI, nuclear medicine;
- a basic knowledge of clinical pathology;
- a basic clinical knowledge of veterinary pharmacology, pharmacy and toxicology;
- a basic knowledge of the law and ethical codes affecting veterinary practice;
- an understanding of scientific method, and an ability to apply basic scientific knowledge, sufficient to enable them to extend their knowledge of, and utilise future developments in, veterinary science.

Objectives for Terms 7 – 9 of the clinical course

The second level of the course occupies the final year (three terms plus vacations). By the time they sit Part III of the Final Vet MB examination, students should have:

- applied their theoretical knowledge and increased their practical skills in the areas above during 6<sup>th</sup> year clinical rotations

and should also have acquired:

- the ability to draw up a list of reasoned differential diagnoses following investigation of disease;
- a knowledge of the techniques necessary to carry out under supervision common surgical procedures in domesticated animals, including anaesthesia of most species;
- the ability to devise and carry out a treatment or management plan following clinical assessment of common medical problems;
- the ability to manage common **obstetrical** problems;

- the capacity to communicate effectively with clients and with colleagues in the veterinary profession and in other disciplines;
- the ability to work well as a member of a team;
- the capacity to undertake successfully an extended study of a topic and to communicate the results verbally and in writing.

## 1.2 Comments

We consider that the objectives stated above are met in full.

We consider the following to be the main strengths of the course:

- A strong scientific basis underpinning the course
- Highly qualified and dedicated academic and support staff
- Interaction with highly motivated Senior Clinical Training Scholars
- All standard entry students take an intercalated degree
- Small group teaching and detailed clinical supervision leading to high levels of specific clinical skills
- Final year clinical rotations
- Lecture-free final year
- High level of student pastoral support in Departments and Colleges
- State-of-the-art clinical facilities
- First opinion coverage in small animal, equine and farm animal clinics
- Strong administrative support for all teaching activities

We consider the following to be weaknesses in the delivery of the course:

- Small staff numbers in some clinical areas, resulting in difficulties in providing cover for holiday, sabbatical, parental or sickness leave
- Inadequate lecture and teaching room facilities, hinders introduction of learning and teaching technologies

In relation to availability of post mortem material, we will continue to encourage owners to permit post mortem examinations of their animals and have had some success here since the last Visitation. Numbers from the RSPCA clinic and farm animal numbers are increasing. We will continue to acquire and make maximum use of pathological material from the abattoir. We will continue to explore the acquisition of post mortem material from other sources such as wildlife parks.

In relation to caseload in farm animal and equine referral areas, we will continue to maximise the teaching use of all cases passing through the Department. We are firmly of the view that the number of cases available is of secondary importance to the use made of each case. We are confident that our clinical teaching equips students with the day one competences appropriate to their first post-graduation year. Alternatives to clinical cases, such as cadaver surgery and CAL are utilised, and will be further developed. The Clinical Skills Centre will be used to deliver skills learning and teaching.

The shift in emphasis away from the use of hospitalised cases for teaching to the use of ambulatory cases has been successful, following the setting up of the equine

first opinion practice, the expansion of the existing farm animal ambulatory clinic, and the expanded use of the RSPCA clinic and the Blue Cross adoption centre.

All areas of the Department are supported by a small, but effective administrative team. However, there is no spare resource here and we are concerned about our ability to cope with any increased requirements on them, for example in relation to new QA activities, or expanded clinical activities.

### 1.3 Suggestions

The Department urgently needs investment in its didactic learning and teaching infrastructure, in particular the refurbishment of the two lecture theatres and three seminar rooms in the teaching block, in order to give scope for the introduction of learning and teaching technologies.

Since relation to small staff numbers in some clinical areas, the situation has improved over recent years thanks to new initiatives such as the appointment of clinical veterinarians to support clinical service delivery. The Department is now exploring possibilities such as the expansion and better use of Associate Lecturer provision. However, the staffing situation is likely to become critical in core disciplines (e.g. small animal medicine, dermatology, cardiology and imaging and farm animal medicine) over the next 5 years due to impending retirements. The Department will struggle to cover teaching across these areas without further academic positions.

The consideration that the Hospital is not core facility makes us financially very vulnerable to changes in University policy and we would like it to be classified as a core facility.

## CHAPTER 2

### ORGANISATION

#### 2.1 Factual information

- i) Department of Veterinary Medicine  
Madingley Road  
Cambridge CB3 0ES

Telephone: 01223 337701  
Fax: 01223 337610  
Website: [www.vet.cam.ac.uk](http://www.vet.cam.ac.uk)

Head of Department: Professor J L N Wood

Deputy Head of Department and Dean of the Veterinary School:  
Professor M E Herrtage

- ii) Faculty Board of Biology  
School of the Biological Sciences  
17 Mill Lane  
Cambridge CB2 1RX

Telephone: 01223 766899  
Fax: 01223 332355  
<http://www.bio.cam.ac.uk/sbs/facbiol/>

Director of Medical and Veterinary Education (DMVE):  
Dr D Good

- iii) The Department of Veterinary Medicine and Faculty of Biology are both constituent parts of:

The University of Cambridge  
University Offices  
The Old Schools  
Cambridge CB2 1TT

Vice-Chancellor: Professor Sir L Borysiewicz

## **Competent authorities overseeing the establishment**

The Faculty Board of Veterinary Medicine and Faculty Board of Biology are constituent parts of the School of the Biological Sciences, which is subordinate to the General Board of the Faculties of the University and ultimately to the University Council and Senate. The Faculty Board of Veterinary Medicine has a specific and authoritative role in educational and related matters, and acts as the interface between the Department and the committees of the General Board (in particular the Education Committee). The Faculty Board of Veterinary Medicine has a persuasive role in matters of resource allocation, but this function is the responsibility of the Head of Department through the School of the Biological Sciences.

The remit, structure and reporting lines of the committees in the Department are detailed in SER2 Chapter 1.

## **Responsibilities, constitution and function of the main administrative bodies in the Department**

The Department is run as a single academic unit and is the only Department in the Faculty of Veterinary Medicine.

The management of the Department rests with a Strategy and Executive Committee of senior academic staff. The Executive Committee is responsible for administrative and resource issues in the Department, and acts as a facilitator in implementing decisions on educational strategy and provision.

The Strategy and Executive Committee devolves responsibility for defined areas to the Teaching Strategy Committee, Research Strategy Committee and Hospital Strategy Committee. The Communication and Engagement Group and twice yearly meetings between the Head of Department and the Department (one of them a formal meeting of the Faculty) provide important opportunities for feedback to the Head of Department and the Strategy and Executive Committee.

As a broad overview, the veterinary course in its entirety (i.e. preclinical and clinical) is overseen by the Veterinary Education Committee. The teaching programme in the preclinical years is the responsibility of the Faculty Board of Biology, which devolves the day-to-day running of it to the MVST I Committee and the Director of Education in the Faculty of Biology. In the clinical years, the Faculty Board of Veterinary Medicine is responsible for the teaching programme, with day-to-day organisation of it being the remit of the Teaching Strategy Committee and the Director of Teaching in the Department.

The Education Committee of the General Board maintains a constant overview of the course, and approves major changes to the veterinary teaching programme and the Regulations pertaining to it.

## **Involvement of the veterinary profession and general public in the running of the Department**

The Department welcomes comments and views from the profession, and encourages practices providing vacation EMS to give constructive feedback. A

number of local practices provide input to the teaching of the course, and we welcome this interaction.

There is no direct participation by the general public in the running of the Department. The Hospital sends out client satisfaction questionnaires and the returns are reviewed periodically. Other efforts to gain public involvement are managed through the University of Cambridge Veterinary School Trust. Their work is, of course, primarily aimed at fund raising, but we hope to gain some patient-owner advice on service satisfaction from this source.

### **Rules for the appointment of elected officials of the Department**

The Head of Department and Deputy Head of Department are appointed, usually for a period of 5 years, by the University on the recommendation of the Faculty Board.

The Dean of the Veterinary School is appointed, without limit of time, by the University on the recommendation of the Faculty Board.

Members of the Strategy and Executive Committee are appointed by the Head of Department and the remit of that committee is described in SER2 Chapter 1.

All other internal appointments, e.g. committee chairs, are made by the Head of Department after consultation with the Strategy and Executive Committee and the individuals concerned.

## 2.2 Comments

### **Management of teaching**

The management of veterinary teaching in the six years of the course is complex and is not adequately covered by the information requested for the Visitation and provided above. A more detailed explanation follows.

### **Management of veterinary teaching in the preclinical years**

The Faculty Board of Biology has overall responsibility for the first three years of veterinary education, and reports to the General Board's Education Committee.

### **Management of veterinary teaching in the clinical years**

The Faculty Board of Veterinary Medicine has overall responsibility for the three years of clinical veterinary education, and reports to the Veterinary Education Committee and the General Board's Education Committee.

## 2.3 Suggestions

We are satisfied with the existing Department management structure and organisation, and with the overall mechanisms for the delivery and review of preclinical and clinical veterinary education at Cambridge.

## CHAPTER 3

### FINANCES

#### 3.1 Factual information

##### 3.1.1 General information

The mission of the University of Cambridge is to contribute to society through the pursuit of education, learning, and research at the highest international levels of excellence. The University works in conjunction with the Colleges for educational purposes (the Colleges admit students, and provide a significant amount of small group teaching to undergraduates in years 1 - 3), and also promotes close inter-relationship between teaching, scholarship, and research with strong support for individual researchers as well as research groups as one of its core values.

The funding streams within the University are varied and complex. The attached diagram attempts to show some of the primary income streams and how they flow through the various governance structures: it can be seen that a proportion of funding – including public (HEFCE) funding for teaching, research and related activities (the ‘block grant’) – is made over to the University centrally, while other sources of funding are directed to, and managed by, the Faculty/ Department of Veterinary Medicine.

Other funding received / managed by the University centrally includes the University’s own general endowment income (separate from individual endowments managed by Departments) and elements of “overheads” recovered from various sources (including some funding managed directly by Departments – see diagram: “Chest share of non-direct costs”).

Infrastructure services (buildings, planned maintenance, utilities and central services (e.g. insurance, payroll & pensions administration, human resources, central computing, central libraries) are provided as a core service across the University and are funded via a top slice from the income received by the University centrally. Remaining income is distributed to the Schools / Departments as Chest Allocation.

##### 3.1.2 Allocation of Funding

#### **A.1 Allocation of University Chest Funding**

The allocation of HEFCE funding (of which there are both teaching and research support elements) is informed by a Resource Allocation Model (RAM) at University level, and at the level of each of the six constituent Schools of the University. The University’s Planning and Resources Committee oversees the RAM.

The University’s own introduction to the RAM emphasises that the RAM should be viewed as a Resource Allocation Model and not a Resource Allocation Method. The premise of the RAM therefore is to establish the cost of an activity and the source funding which meets that cost. Given the economic complexity of a large modern

university it cannot be expected that every activity will be in financial equilibrium. Cross subsidy is to be expected, so it is therefore important to identify where this occurs. Thus, the RAM **does not set the allocation of actual cash resources**, but provides an overview of income and expenditure that is useful for strategic financial planning purposes across each School and the University as a whole. The RAM is underpinned by a number of drivers, such as student numbers, fee income, the HEFCE weighting for student units of resource, space occupancy data, and research performance as determined in the HEFCE Research Excellence Framework Exercise, which takes place every seven years (most recently in 2014).

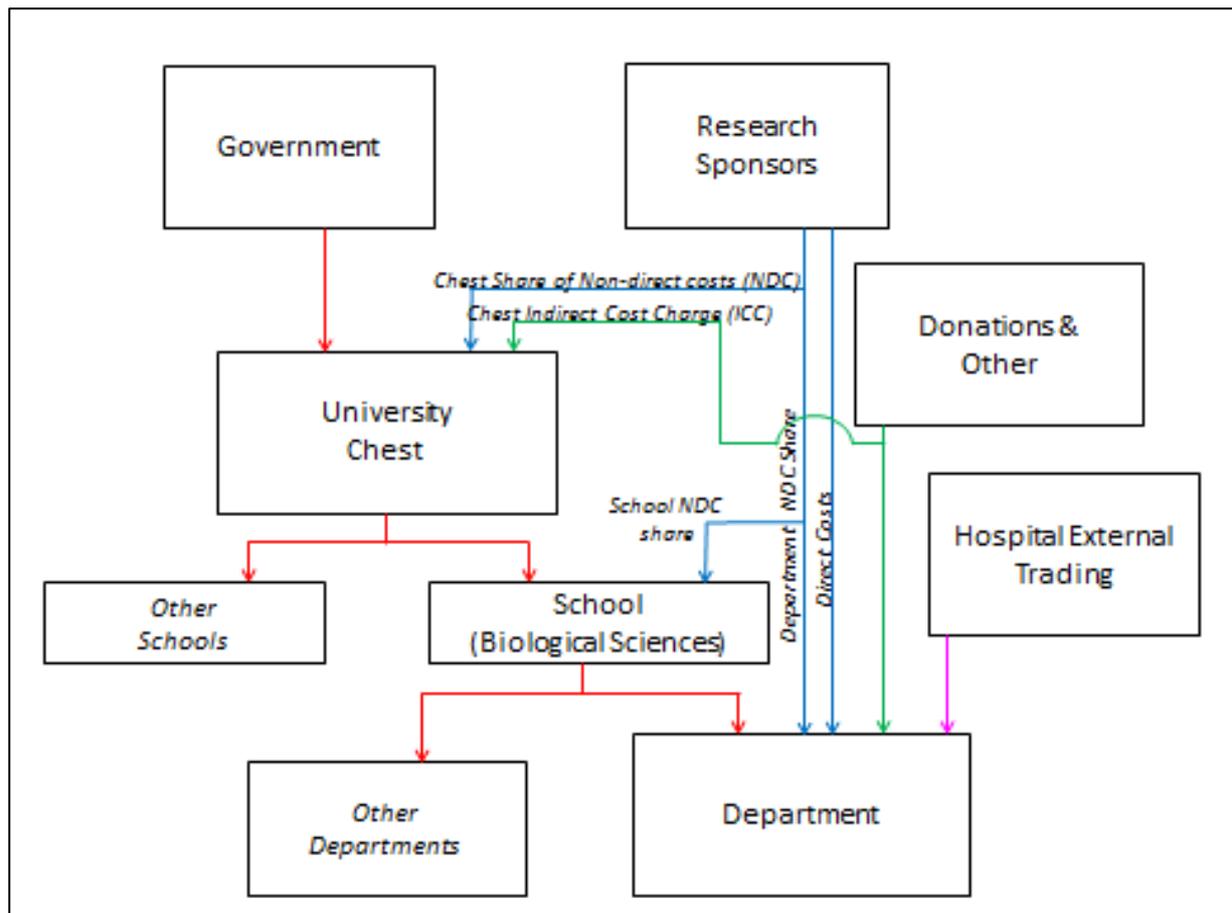


Figure 3.1. Financial flows within the University of Cambridge

The Council of the School of the Biological Sciences (CSBS) is responsible for monitoring the position of Faculties and Departments with respect to the RAM, and is also responsible for **setting the actual allocation of Chest Allocation to Faculties / Departments**.

Chest Allocations (of central funding) to Faculties / Departments take the form of local budgets for staffing, running costs, equipment, and student EMS support, and are intended to support both teaching and research.

The School of the Biological Sciences is considered “over-funded” in current iterations of the RAM (i.e. income earned is less than the costs of the School Chest Allocation and the related central costs of the School), but this has not translated into

significant cuts in budgets, although there is an awareness of the need for budgetary restraint.

## A.2 “Duality” issues

- 1) As the University has a dual teaching and research remit, members of staff are expected to have both teaching and research responsibilities (although some may be more heavily weighted in one sphere or the other). Chest funding contains elements of HEFCE funding in support of both teaching and research. There is no direct hypothecation of the different elements to specific budgets.
- 2) An important consideration is that the veterinary course is taught by a number of Departments across the School:
  - Pre-clinical years are taught primarily by biological departments, with students studying a course (MVST) in parallel with medical students
  - The clinical years are the responsibility of the Department of Veterinary Medicine
  - An intercalated year (Tripos Part II, taken as a third year) based in any biological or certain other Departments

The funding for teaching for the veterinary course (which is driven by student FTE) is therefore distributed through the RAM to the various Departments in proportion to those Departments’ contribution to the teaching activities; thus the public funding for the teaching of veterinary students is distributed in the RAM to Departments as diverse as Biochemistry, Genetics, Pharmacology, and Physiology, Development & Neuroscience as well as the Department of Veterinary Medicine.

**Table 3.1** Annual Income to the Department (£000)

Year	State (government)		Income generated by Faculty		TOTAL
	Non faculty	Direct to Faculty	Services provided	Research	
<b>2013-14</b>	3996	4750	3188	5099	17033
<b>2012-13</b>	2654	4650	2908	5470	15682
<b>2011-12</b>	2097	4848	2735	4930	14611

**Table 3.2** Annual Expenditure in the Department (£000)

Year	Pay		Non Pay			TOTAL
	Salaries	Teaching	Research	Clinical	Other	
2013-14	8714		2940	2148	1694	15496
2012-13	8797		3237	1786	1070	14889
2011-12	8711		2920	1620	1281	14532

### Notes

- Salaries = Staff Costs on grants + all Pay costs
- Research Non Pay includes only non-pay costs funded directly by grants
- Clinical Non Pay costs includes only non-pay costs running through the Vet Hospital
- All other non- pay costs - which include some elements of research support and clinical support (as well as teaching) are included in the Other non-pay category
- No costs are included for infrastructure costs (rates, utilities etc.), nor central University costs
  - Space/ infrastructure costs for Vet Med only = c £1.5m in RAM - a portion of this relates to teaching support and would be deductible from the state funding. Costs for other Departments would also apply
  - Central University Costs for Vet Med = c £1.5m in RAM - a portion of this relates to teaching support and would be deductible from the state funding. Costs for other Departments would also apply
  - College fee for Vet Med only = £881k in RAM for 2013-14 (fully deductible from state funding)

### A.3 Changes to the basis of Chest Allocations to Faculties/ Departments

Any request to vary or increase any Chest-funded activity must be considered by the SBS, and the SBS may take the academic case, and factors such as research performance, the potential for sharing of resources with other Departments, and other financial reserves into account when allocating funds for different purposes.

The continued existence of established academic positions and the re-filling of vacancies (and the career progression of those individuals in post) is based on arguments of academic need as well as the availability of financial resource, and is controlled by the SBS and subject to a further, higher authority, specifically the University's Resource Management Committee.

Were changes to teaching activities planned that would have significant impacts on (future) RAM Income, the Departments / School have the ability to bid for additional Chest resource via an annual strategic planning exercise.

#### In summary

The Chest Allocation to the Faculty/ Department of Veterinary Medicine (and other Departments contributing to the teaching of the Veterinary Course) is therefore not

simply flexed in accordance with the income “earned” to the Chest by those Departments. The budget provided each year is to cover

- The costs of the agreed cohort of academic posts – at whatever level the individuals are appointed/ promoted
- The costs of the agreed cohort of support posts
- A cash-based non-pay budget

Each Department is expected to manage the local direct costs of its teaching and research activities via the Chest funding devolved to it via the School.

#### **A.4 Other sources of funding**

Other sources of funding that contribute to supporting the veterinary course and other Faculty/ Departmental activities are:

- 1) Funding from the Veterinary Hospital which trades externally with the public. In recognition that this service heavily underpins the teaching environment for veterinary students, this income stream is delivered “untaxed” to the Department (see references to Non-direct costs/ Indirect Cost Charges below). However this income stream is variable depending on economic conditions and the local environment (competition etc.)
- 2) Funding from Research Sponsors – which is highly variable depending on the success rates of individual applicants from the Department, and is usually limited to Direct Costs only (charitable sponsors) or 80% of full Economic Cost (RCUK sponsors)
  - a) Funding for the direct costs of research is delivered directly to the Department and Principal Investigators. These funds may only be spent in accordance with the sponsors’ terms & conditions
  - b) If contributions to non-direct costs are recovered from sponsors then an element (c. 85%) is top-sliced for contribution to the University’s central costs (the “Chest share”), and a further element is top-sliced by the School (c. 4%) with the remainder available to the Department to cover local costs of research support
- 3) Fund raising for financial support/ donations is a significant contributor to the development costs of the Veterinary Hospital. Significant legacies have enabled the Hospital to undertake projects to expand and enhance their service provision and student facilities. However, this income stream is highly variable

All of the above streams are essentially under the control and responsibility of the Department.

#### **Linkage of funds to particular factors**

Only in the RAM are HEFCE funding streams allocated / modelled in accordance with student numbers and research output. While the RAM informs Chest Allocations it does not prescribe them. Sustainability of academically excellent teaching and research activities is the principal mechanism considered by the CSBS in making allocations to the School’s Faculties / Departments

## Comparison of the funding for the Department with other teaching courses

HEFCE funded students attract a standard Unit of Resource based on the banding of their course. For 2014-15, the standard Unit of Resource for home undergraduates is:

<b>Band</b>	<b>UoR (£ p.a. per FTE)</b>
<b>A</b>	£10,000
<b>B</b>	£1,500
<b>C</b>	£250
<b>D</b>	£0

Veterinary students are funded at the Band A rate.

All students also pay a £9,000 tuition fee, 50% of which is distributed to the Colleges for their contribution to student (pastoral) support and small group teaching.

## Determination of the allocation of funds within the Department

At Departmental level, the local budgets for running costs, equipment and student EMS support are managed at the discretion of the Head of Department through the Strategy and Executive Committee and the Finance Committee.

Departmental income from other sources, i.e. from clinical and diagnostic services, and any other income (e.g. donations for student prizes or Hospital purposes) is similarly managed at the discretion of the Head of Department, through the Strategy and Executive Committee or the Hospital Management Committee.

## Mechanisms for funding major equipment and its replacement

Funding is held at various levels of the University's governance structure for needs of different magnitude:

- For major items of equipment (>£1m, with at least £500k coming from School/ Faculty / Department sources) funding is held at University level, managed by the RMC, in order to avoid "lumpiness" in planning, and the need for significant accumulations of resource at lower levels. These needs are primarily research driven.
- The School administers a fund of c £1m pa that is intended to fund a selection of infrastructural equipment items (>£50k, annual competitive bidding procedure) and to contribute to the matching requirements of research sponsors (who will not fund research equipment items in full)
- Smaller items of equipment may be funded through an equipment allocation made to the Department on an annual basis (currently c. £55K per annum), or by other funds available to the Department (e.g. research overheads, donations).

### **Within the Department:**

The Strategy and Executive Committee delegates responsibility to the Research Strategy Committee for prioritising and putting forward bids to central funds for major research equipment. It delegates responsibility to the Hospital Management Committee for prioritising and putting forward bids for Hospital equipment if bids to central funds permit inclusion of clinical equipment. The Strategy and Executive top slices the annual £55K equipment allocation for purposes such as computing and health and safety needs, then requests bids from across the Department for items of small equipment. In practice, the funds are mainly used for teaching-related purposes. The Veterinary School Trust provides a regular stream of donation funding for the purchase of equipment for use in the clinics and items for use in the Clinical Skills Centre. The disbursement of these funds is managed by the Strategy and Executive Committee and Hospital Management Committee.

### **Mechanisms for funding capital expenditure (e.g. building work, major items of equipment), for building maintenance and how these decisions are taken**

- Public funding: funds for capital building projects and capital equipment needs (e.g. HEFCE Capital Research Infrastructure Funds) are held centrally in the University and are subject to bidding by Departments and Institutions through the SBS. Projects are awarded priority on the basis of need but there are insufficient funds to meet all the competing requirements. Both the Department and preclinical Departments have been allocated significant amounts of public funding since the Visitation in 2008, as documented elsewhere in this report. For example, an award of £1.5m was made to the Department to build the Student Resources Centre, completed 2011.
- Charitable and grant funding: the Department has had considerable success, through the Veterinary School Trust, in securing charitable funding for building projects during the period since the Visitation in 2008. £2.2m was raised from charitable legacies to support the refurbishment of the small animal consulting areas and Clinical Skills Centre, with a further £100K raised to equip these new areas, completed 2014.
- Self-funding: the Department self-funds or part self-funds building projects, and the University is willing to provide loans (at a competitive rate of interest) to facilitate such projects. The Hospital has provided £1m towards the new build of the Clinical Pathology laboratories, completed 2014. The Hospital invests a significant proportion of its surplus income in the purchase of new equipment and maintains a £350K emergency equipment fund to cover any major breakdown of Hospital equipment.
- All capital building projects and purchases of capital equipment are subject to the University's policies and procedures, and there is a good level of support provided by the University's Estate Management, and by its Procurement Services. The Department has full involvement at all stages.

The University's Estate Management (EM) holds a central budget for building maintenance, and has a rolling plan for improvements to the University's estate. Building maintenance is managed through the Department's Facilities Manager in negotiation with the Buildings Surveyor assigned by EM to the Department. Certain

items of building maintenance, e.g. painting, are carried out as part of the improvements plan; urgent matters e.g. collapsed drains, receive attention as they arise; special requests from the Department, e.g. surfacing of car park areas, are graded subject to annual budget constraints.

### 3.1.3 Information on extra income

#### **Retention of extra income**

The Department retains in full all trading income from the Veterinary Hospital.

The University's policy is that research grant funding is initially directed to cover the full direct costs of the research project / programme for which the funding is intended. Only where funding is recovered from research sponsors towards the non-direct costs of the research project / programme is there any requirement to give a portion to other bodies.

The majority of research grants in Veterinary Medicine are sponsored either by Charities (which do not contribute to non-direct costs) or UK Research Councils which contribute by paying 80% of Full Economic Costing (fEC). The University's Policy on Division of Research Grant Income under Full Economic Costing (fEC) states that the income will first be used to pay direct costs on the grant, and then any remaining income will be split between the Chest and the Department in the ratio 6:1.

The School has instigated a policy that requires 25% of the Department share of non-direct costs (NDC) be diverted to the School to enable further support to Chest Allocations.

Thus the Department may receive only a small percentage of the funding recovered for non-direct costs ( $1/6 = 16.7\%$ , less 25% = 12.5% of NDC recovered) but this is to reflect that the majority of the non-direct costs of research (estates costs, central/indirect costs) are not funded directly by Departments, but centrally.

The University's policy on Indirect Cost Charges states:

The indirect cost charge (ICC) is an overhead charged on pay costs met from certain non-Chest sources of funds. The charge is intended to recognise and recover part of the central and local infrastructure costs of non-Chest funded activity. The sources of funds covered by the ICC are:

- External trading
- General and Specific donations
- Departments' share of charity QR
- Departments' shares of non-direct costs (excluding pooled labour) and research overheads

The ICC was approved by the Resource Management Committee (RMC) in June 2011 and replaced the Finance Working Party (FWP) levy, which had operated since 2003.

An overhead recovery target is applied at School level based on 25% of pay costs incurred during the year.

The School has set a policy that charges ICCs at 30% on all eligible accounts. By setting the charge at a higher level, additional charges are levied to cover exempts of certain, regularly reviewed, accounts.

The Veterinary Hospital's Trading Income account is exempted from ICC charges, but Hospital and Department trading / donation account balances that are used to fund staff costs do incur an ICC (this is currently <£10k per annum). The University currently provides a subsidy to cover the ICC charges incurred, but there is a risk that if the number of staff appointments on trading or donation accounts increases, the Department will be asked to pay the ICC charges in full or to pay the ICC charges that exceed the amount of the central subsidy.

### Student Fees

All Home/ EU students pay a £9,000 per annum tuition fee. The University tuition fee levels are set by the Planning and Resources Committee subject to the agreement (Grace) of the Regent House (the University's governing body and principal electoral constituency).

In terms of distribution, fees form part of the University Chest (central) Income and are distributed to Schools in the RAM based on student numbers. Of the £9,000 fees, 50% is distributed to the Colleges (a central charge in the RAM) for their contribution to student (pastoral) support and small group teaching.

The ability to bid for additional Chest resource via the annual strategic planning exercise should additional fee income ever be planned / anticipated through increases to student numbers is described above.

The Department budget for the last two academic years (in £000) were as follows:

	2013-14			2014-15		
	Dept	Hosp	Total	Dept	Hosp	Total
<b>Stipends</b>	2,528.3	577.5	3,105.8	2,544.9	657.2	3,202.1
<b>Wages</b>	779.0	567.1	1,346.1	800.2	590.8	1,391.0
<b>Non Pay</b>	434.7	-	434.7	496.0	-	496.0
<b>Total</b>	<b>3,742.0</b>	<b>1,144.6</b>	<b>4,886.6</b>	<b>3,841.1</b>	<b>1,248.0</b>	<b>5,089.1</b>

### 3.2 Comments

The finances of the Department are adequate to sustain its educational programmes, to allow for research and to meet the educational mission of the Department. Specifically, the finances are adequate to:

- perform research-based teaching
- attract and retain highly qualified non-clinical academic staff
- reach satisfactory teaching staff/student and teaching staff/support staff ratios
- ensure provision and renewal of facilities and equipment

- ensure the hygiene and safety standards of premises used in teaching and clinical training
- secure adequate caseload, including emergency caseload, across species and services, in accordance with the most recent advances in veterinary medicine.

The finances of the Department are currently not adequate to attract and retain highly qualified academic clinicians, and we experience considerable difficulty as a result of this. The Department has been engaged in a lengthy process to secure the agreement of the University to offer clinical supplements and other improvements to financial conditions of employment.

The Department's priority for the use of increased capital funding would be to build a purpose-designed state-of-the-art Veterinary School complex, preferably situated on the University's biomedical campus.

The Department's priority for the use of increased recurrent funding would be to provide clinical supplements (market supplements or percentage uplift to salary) for clinically-active academic staff, to make pensionable payments staff for out-of-hours emergency clinical work (payment is currently non-pensionable) and to introduce a salary uplift for staff upon attaining a Diploma in a clinical discipline.

The Department benefits from being part of a successful and well-managed University, and accepts that as part of this it is bound by the University's Financial Regulations and by its financial management structures. As a result of this, the Department has little autonomy or flexibility in financial matters but this is outweighed by the benefits of membership of the collegiate University and the general willingness of the central University to discuss and negotiate where financial matters are concerned.

### 3.3 Suggestions

While retention of all service income from Hospital services provides an incentive for the Department to develop these services for the benefit of teaching and research, the Department is concerned that an overhead charge may be levied on further staff employment costs within the Hospital as the University has classified the Hospital activities as not core to the Department. We strongly disagree with this situation as we cannot provide an accredited veterinary teaching course without the Hospital.

## **CHAPTER 4**

### **CURRICULUM**

#### **4.1 Factual information**

There is no defined national curriculum for veterinary medicine in the UK, but in the early 1990s the RCVS produced a report (the Lucke Report), which suggested ways that veterinary education should develop in the future. These ideas have been developed by the QAA into a benchmark statement for veterinary science in the UK, and further refined with the introduction of day one competences by the RCVS, which have been endorsed by EAEVE. The six-year curriculum at Cambridge broadly follows a linear model with strong foundations in the scientific knowledge underpinning veterinary work preceding a clinical course. The additional year compared with other UK veterinary schools is the third year of the Cambridge course where students have the opportunity to explore an area of scientific interest in greater depth. The Learning and Teaching Review conducted by the University in 2013 judged the curriculum to be excellent and a model that other veterinary curricula should follow.

Interleaved with this linear curriculum are several vertically-integrated themes, including animal management, veterinary public health, professionalism, communication and consultation skills, evidence-based medicine. Further details are given in SER 1 Chapter 5.

Overall, the curriculum is designed to meet the RCVS Day One Competences, the EAEVE requirements and the QAA Subject Benchmark for Veterinary Science. Within the above constraints and the requirement to provide a degree course registrable with the RCVS, the Department is free to change and adapt the clinical curriculum as it believes appropriate. The processes of changing the pre-clinical course are described below and in SER 2 Chapter 2.

Veterinary education in Cambridge is divided into preclinical study, concentrating on the biological sciences, during the first three years of the course, and the study of clinical veterinary medicine during the final three years of the course. The ultimate responsibility for the organisation and delivery of teaching in Cambridge lies with the General Board and its Education Committee.

In practice, responsibility for teaching programmes is devolved to Faculty Boards of the relevant departments. For veterinary education these are the Faculty Board of Biology, which is mainly responsible for the first three years of the course, and the Faculty Board of Veterinary Medicine, which is responsible for students during the clinical years. The management structure and the manner in which decisions are taken concerning curriculum matters and course content are detailed in SER 2 Chapters 1 and 5.

Decisions on the curriculum and course content in the first two years are the responsibility of the Medical and Veterinary Sciences Tripos Part I (MVST I) Committee (and the Biological Sciences Committee within the Faculty of Biology),

which reports to the Veterinary Education Committee (and to the Faculty Board of Biology). Course management committees submit detailed proposals for their course curriculum to the MVST I Committee. The MVST I Committee monitors the success of individual courses on a yearly basis, and has a mechanism for carrying out reviews of each course on a rolling two-year programme.

In the clinical course the Teaching Strategy Committee, chaired by the Director of Teaching, makes decisions on the allocation of hours between subjects, and between theoretical and practical teaching. The most recent internal curriculum review (General Board Learning and Teaching Review, Appendix 2) took place in 2013. A number of changes were suggested as part of the Learning and Teaching Review, and these either have been or are currently in the process of being implemented. Other changes and modifications have been made to the curriculum since then; any significant addition or subtraction of material is approved by the Teaching Strategy Committee. The Director of Teaching in the Department of Veterinary Medicine has the overall day-to-day responsibility for the (clinical) curriculum and a particular role of the Director of Teaching is to keep the overall balance of the course under review, to foster integration and co-ordination between different elements of the curriculum and to raise issues with the Teaching Strategy Committee. Small changes to the curriculum can be approved by the Director of Teaching, who is responsible for taking forward larger issues to the Teaching Strategy Committee and to other committees for discussion. Further details of the Teaching Strategy Committee are given in SER 1 Chapter 1.

Much weight is put on reports of the External Examiners, and their comments are considered by the Teaching Strategy Committee which also drafts responses. These responses are then considered by the Strategy and Executive Committee, the Veterinary Education Committee and the Faculty Board of Veterinary Medicine, which make recommendations to the Teaching Strategy Committee for implementation.

#### 4.1.1 Status of subjects and types of training

The Department, through the Director of Teaching, Course Organisers and the Teaching Strategy Committee, maintain a rolling programme of review and revision of courses. The process by which this occurs is outlined in SER 2 Chapters 1 and 5.

Recent innovations to the curriculum have been:

- Introduction of a 40-week final year (6<sup>th</sup> year) with modified assessment criteria
- Revision of the induction programme to final year (now 2 weeks and using the Clinical Skills Centre)
- Increased structure to, and modification of, the electives (6<sup>th</sup> year)
- Introduction of Clinical Skills Centre (focus is mainly 4<sup>th</sup> and 5<sup>th</sup> year but applies to all years of the course)
- Integration of animal husbandry subjects into a single course, Integrated Animal Management (4<sup>th</sup> year)
- Restructuring of Principles of Animal Management course (1<sup>st</sup> year)
- Restructuring of Preparing for the Veterinary Profession course (2<sup>nd</sup> year)

- Restructuring of infectious disease teaching into a Principles of Infectious Diseases course (4<sup>th</sup> year) and migration of some information into systems and species courses, to aid integration of knowledge across subject disciplines
- Integration of basic clinical information into a Principles of Clinical Practice exam (4<sup>th</sup> year)
- Revision of the Veterinary Public Health course with increased exposure to food processing premises
- Expansion of first opinion equine and farm animal teaching and first opinion case load (6<sup>th</sup> year)

In addition, supporting farm animal teaching, the University has provided substantial resource for farm animal teaching. The University Farm has been relocated to Park Farm, Madingley, consolidating the cattle and sheep enterprises onto a single site. A number of new buildings and refurbishment accompanied the relocation, to the benefit of student education. These include:

- New, purpose-built lambing shed
- New calf housing
- New robotic milking parlour
- Computerised herd health
- Rotating cattle crush
- Student rest room (when lambing the flock)
- Refurbished seminar room

In clinical services, an on-site partnership with Cambridge Radiology Referrals developed in 2011 provides CT facilities to complement our existing radiography and MRI (and cancer therapy) services. The refurbishment of the Cancer Therapy Centre to allow instillation of the CT facilities also facilitated instillation of a new linear accelerator for cancer therapy.

To support students in developing their practical clinical skills prior to the lecture-free final year clinical rotations, the Department has funded a new Clinical Skills Centre (as part of a £3.2M development of small animal hospital facilities, a new clinical pathology laboratory and the Clinical Skills Centre), supported by a Clinical Skills Centre Co-ordinator (see SER 1 Chapter 6).

Student welfare on the West Cambridge Site is supported both by the Department (provision of a Student Resources Centre; opened 2011; £1.5M) and the University (provision of several catering outlets, sports centre and cashpoint). Students in their pre-clinical years have access to many cafés, coffee houses, etc. in central Cambridge and facilities in central Cambridge Colleges; Downing College has been most supportive in this respect with an open access to its lunchtime dining facilities to students. Further details of catering on the West Cambridge site are outlined in SER 1 Chapter 5.

#### 4.1.1.1 Status of subject – core, elective, EMS

A detailed outline of the 6-year curriculum is given in Appendix 3.

The core curriculum (detailed below) is delivered over 5 of the 6 years of the course and covers all the main subjects of pre-clinical, para-clinical and clinical disciplines.

Except for Affiliated Students (who have a previous Honours degree in a relevant biological subject), all students undertake a Part II Tripos (third year) course which they select from a wide range of choices. Most students undertake a Part II within the Natural Sciences Tripos although a small number elect to undertake another discipline such as management studies in their Part II year. The Part II course is conducted over 3 academic terms.

In their 6<sup>th</sup> year of the course, all students are required to undertake an “elective” project. Students are encouraged to devise and develop their own project with their elective supervisor; lists of suggested projects are also provided by staff. The elective period (8 weeks) is normally composed of a 5-week clinically-based research project (including write-up and oral presentation) and a 3-week seminar/practical component.

All students are required to undertake a minimum 12 weeks of pre-clinical EMS and a minimum 26 weeks of clinical EMS. Details of the EMS requirements at Cambridge, which fulfil the published RCVS criteria, are given in SER 1 Chapter 14.

All students are also required to attend the abattoir premises at School of Veterinary Science, University of Bristol, for 1 week. This week forms part of the core curriculum and ensures a consistent delivery of abattoir experience to all students. The abattoir staff are experienced educators, with specialist qualifications in Veterinary Public Health, and provide high-quality teaching in Veterinary Public Health, including key aspects of meat hygiene and food safety (see section 4.1.3).

#### 4.1.1.2 Types of training

A range of teaching methods is used throughout the curriculum: lectures, practicals (both desk-based and laboratory-based, including post-mortem room and Clinical Skills Centre), problem-based learning/scenarios, clinical scenarios, seminars, case-based learning, clinical rotations, etc. Thus, for example, the parasitology teaching includes scenario-based directed learning sessions, the neurology and equine medicine courses include case-based learning within the lecture series, animal breeding and infertility & obstetrics courses utilise the haptic device within the Clinical Skills Centre and the final year rotations all include small group seminar teaching.

##### 4.1.1.2.1 Theoretical training

Theoretical training is delivered across all 6 years of the curriculum but with a different balance of formats as the course progresses. The curriculum broadly follows a model of in-depth teaching of biological systems in the pre-clinical years together with a teaching of pathogens and host tissue/cellular responses to injury in the first two years. In Year 3, where students undertake more in-depth learning in a subject area of their choice (an opportunity to pursue more diverse interests and develop their critical thinking skills), theoretical knowledge is delivered through lectures and small group seminars. In the 4<sup>th</sup> and 5<sup>th</sup> years of the course, the application of that knowledge to animal management and to diseases of animals builds on that earlier training, with a progression from theory to practical applications and clinical practice over the 4<sup>th</sup> and 5<sup>th</sup> years.

The curriculum also includes vertically-integrated themes spanning the pre-clinical and clinical years, for example animal management, reproduction, breeding and infertility, professionalism, communication and consultation skills.

In the first two preclinical years, theoretical training is delivered through a lecture-practical format. In some subject areas, veterinary students are taught alongside medical students and/or students undertaking the Natural Sciences Tripos (NST). This reflects the cross-species and interdisciplinary nature of much basic (mammalian) biological science. In all those courses, however, there are specific elements that are veterinary-related and undertaken only by the veterinary students. This Tripos system establishes solid foundations in veterinary-related sciences and the concept of One Health by encouraging a comparative approach to medicine. A further advantage of the MVST/NST system also builds students' relationships with, and understanding of, other professionals in the biomedical sciences.

In the fourth and fifth years, theoretical training is delivered through similar formats, but also through seminars, directed learning sessions and clinical rotations.

A small amount of theoretical teaching in the lecture-free final year is provided in seminars as part of the rotations and elective periods.

#### 4.1.1.2.2 Supervised practical training

Laboratory and desk-based work is conducted throughout the first 5 years of the course using a full range of teaching methodologies. Clinical laboratory work is introduced in year 4 and continues through the whole clinical curriculum.

Non-clinical animal work is conducted from the first week of year 1 (animal husbandry, live animal anatomy) through to 4<sup>th</sup> year pathology rotations (further animal handling, and where all students perform at least 2 full necropsies with accompanying histopathology and undertake practical teaching in meat hygiene/inspection) and further in 5<sup>th</sup> and 6<sup>th</sup> year with further VPH training.

Clinical work with live animals is conducted in all three years of the clinical course through clinical rotations (4<sup>th</sup> and 5<sup>th</sup> years) and the case-based lecture-free final year. Training in practical clinical skills commences in 4<sup>th</sup> year. Thus the practical clinical training is centred on the clinical rotations in 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> years, which all students are required to complete. From October 2014, this has been supported by the new Clinical Skills Centre.

In 4<sup>th</sup> year these clinical and clinical-related rotations occupy two mornings a week throughout the Michaelmas and Lent terms, and a further morning in Easter term, with a total of 22 mornings for each student each year. In 5<sup>th</sup> year there are two mornings a week throughout the Michaelmas and Lent terms, with a total of 28 mornings for each student. In the final year, which is lecture-free, students spend 20 weeks full time in rotation work in the clinics of the QVSH (i.e. large and small animals). These rotations involve a standard 8-10 hour day with meal breaks, although students will be expected to stay on for emergency work in the evenings as required. The subjects of the rotations are listed below.

#### 4<sup>th</sup> Year:

- Communication skills
- Consultation skills
- Equine clinical studies
- Exotic animal handling and husbandry
- Farm animal clinical studies
- Laboratory animal management
- Post mortem examination
- Radiography
- RSPCA clinic
- Small animal clinical studies

#### 5th year:

- Bovine foot care
- Clinical pathology
- Communication skills
- Consultation/clinical examination skills
- Equine clinical studies
- Farm animal clinical studies
- Gynaecology
- Neurology
- Obstetrics
- Ophthalmology
- Radiography and radiology
- RSPCA Clinic
- Small animal clinical studies
- Veterinary public health

#### 6<sup>th</sup> Year:

- Anaesthesia and peri-operative medicine
- Equine studies (medicine and surgery)
- Farm animal medicine (including large animal surgery)
- Imaging
- Small animal medicine (including oncology, clinical pathology and neurology)
- Small animal orthopaedic surgery
- Small animal soft tissue surgery

From June 2014, a more formal Emergency and Critical Care rotation has been introduced and is now co-ordinated with the anaesthesia rotation. Further detailed information on the content of the individual rotations can be found in the Curriculum Document, but a few general points can be made.

The rotations are constructed in such a way that basic clinical training in 4<sup>th</sup> year is built on in subsequent years. Practical classes in 4<sup>th</sup> and 5<sup>th</sup> year introduce students to clinical examination, history taking in all species (communication skills), post mortem examination and biopsy taking, radiography, basic gynaecological examination, neurological examination and the eye. Practical classes also introduce clinical pathology as an integral part of case management.

In 6<sup>th</sup> year rotations, students take individual responsibility for case management under supervision. This involves making diagnostic and treatment plans, involvement in carrying out treatment, and communication with the owner, referring veterinary surgeon and clinician responsible for the case. The graduated, closely supervised approach builds confidence and introduces responsibility closely matched to student ability. In the 6<sup>th</sup> year there is a considerable inbuilt element of continuous assessment in the rotations. Up to June 2014 group sizes in the rotations were usually 6 or 7 although some activities took place in groups of different sizes. Since June 2014, group sizes on the small animal rotations have been 3-4 whereas group sizes on the equine and farm animal rotations remain at 6-7.

In addition to the clinical rotations there are clinical practical classes in bovine reproduction, including rectal pregnancy diagnosis. Classes in bovine rectal examination (4<sup>th</sup> year onwards) are compulsory and are optional for equine rectal examination (5<sup>th</sup> year onwards). All students now receive training on a haptic cow/horse in the Clinical Skills Centre before conducting rectal examinations of the live animal.

Students are also involved in the out-of-hours emergency activities of the QVSH through a specific rotation. Every student during their final year will spend a minimum of 14 days as part of a group of 3-4 students providing night and weekend 24-hour nursing cover in the QVSH.

Students are fully involved in the work of the farm animal and equine ambulatory (first opinion) clinics as part of the farm animal and equine rotations.

Students in 6<sup>th</sup> year participate in first opinion small animal clinics at the Cambridge RSPCA clinic, which provides access to, and practical training in, routine procedures such as neutering and dentistry. Weekly visits to the Blue Cross centre in Cambridge are also included and provide small animal population experience.

#### 4.1.2 Undergraduate curriculum followed by all students

##### 4.1.2.1 Curriculum hours

Summaries of curriculum hours per year and per subject are given in the following tables. They are based on the 2013-14 academic year.

Table 4.1 General Table of curriculum hours taken by all students

Year	Hours of training							
	Theoretical training		Self-directed learning	Supervised practical training			Other	Total
	Lectures	Seminars		Laboratory and desk-based work	Non-clinical animal work	Clinical work		
<b>First</b>	194		6 (CAL)	173	18		66*	457
<b>Second</b>	184	13	3	171			82*	453
<b>Third**</b>								
<b>Fourth</b>	325	29	6	142	28	20	2	552
<b>Fifth***</b>	215	31		42		104		392
<b>Sixth</b>			320			800		1120
<b>Total</b>	<b>918</b>	<b>73</b>	<b>335</b>	<b>528</b>	<b>46</b>	<b>924</b>	<b>150</b>	<b>2974</b>

\* In Years 1 & 2, 'other' represents College small group supervision.

\*\* Year 3 does not form part of the core veterinary course, but is the equivalent of an intercalated degree; for information, 3<sup>rd</sup> year students receive 100-120 hours of lectures, and 160 hours of practical work, and approximately 200 hours of independent study.

\*\*\* Excluding the 2-week "Induction to Final Year" – seminar and practical based.

Table 4.1.2 Yearly curriculum studies

### First Year

Subject	Hours of training					Total
	Lectures	Practical work	Supervised work (PBL/ seminars)	Non-clinical animal work	Other*	
Histology		20				20
Introduction to the Scientific Basis of Medicine	10					10
Homeostasis	54	23			20	97
Molecules in Medical Science	52	18	10		20	100
Veterinary Anatomy & Physiology	41	85		13	20	159
Principles of Animal Management	37		10	18	6	71
<b>Total</b>	<b>194</b>	<b>146</b>	<b>20</b>	<b>31</b>	<b>66</b>	<b>457</b>

\* College supervisions / tutorials

## Second Year

Subject	Hours of training					Total
	Lectures	Practical work	Supervised work (seminars)	Non-clinical animal work	Other*	
Biology of Disease	42	50			20	112
Mechanisms of Drug Action	35	51			20	106
Neurobiology & Animal Behaviour	49	26			20	95
Veterinary Reproductive Biology	24	16			16	56
Comparative Veterinary Biology	22	30			4	56
Preparing for the Veterinary Profession	12		11	3	2	28
<b>Total</b>	<b>184</b>	<b>173</b>	<b>11</b>	<b>3</b>	<b>82</b>	<b>453</b>

\* College supervisions / tutorials

## Fourth Year (2013-14)

Subject	Hours of training					Total
	Lectures	Practical work	Supervised work	Clinical work	Other	
Alimentary	25	15				40
Anaesthesia	14		6 (seminars)			20
Animal Breeding *	20	4				24
Animal Housing	8					8
Animal Welfare	12					12
Cattle	22					22
Clinical Pathology	16	12				28
Clinical Pharmacology and therapeutics	11					11
Dentistry	4					4
Equine Husbandry	7				2	9
Evidence Based Medicine	6					6
Exotic, wildlife and conservation medicine	19					19
Principles of Infectious Diseases	32	6	9			47
Nutrition	16					16
Principles of Oncology	8					8
Ophthalmology	10					10

Subject	Hours of training					
	Lectures	Practical work	Supervised work	Clinical work	Other	Total
Orthopaedic Pathology	6	3				9
Poultry	10					10
Radiography and Radiology	9					9
Respiratory	11	3				14
Small Ruminant Husbandry and Medicine	19	6				25
Principles of Surgery	5	2				7
Veterinary Public Health (VPH)	35	30	9			74
Gross Pathology		14				14
Pathology Seminars			4 seminars			4
<b>Clinical Rotations</b>						
Equine Clinical		12				12
Exotic Animal Management		4				4
Farm Animal		7				7
Post Mortem		20	1 seminar	1		22
Radiography		4				4
Small Animal Clinical		7				7
RSPCA Clinic				12		12
Consultation Skills		7				7
Laboratory Animal Management		3				3
Lambing				24*		24
<b>Total</b>	<b>325</b>	<b>159</b>	<b>29</b>	<b>37</b>	<b>2</b>	<b>552</b>

\* The 4<sup>th</sup> year cohort is responsible for lambing the University Farm flock. The year group is divided into teams and provide 24-hour cover over a 5 week period. The number of hours given here is a reasonable average

## Fifth Year (2013-14)

Subject	Hours of training					
	Lectures	Practical work	Supervised work	Clinical work	Other	Total
Cardiology	14	2				16
Cattle medicine	4	4				8
Clinical pathology	3	3			4	10
Dentistry	4	6				10
Dermatology	13	3				16
Emergency and Critical Care	8					8
Endocrinology	12	3				15
Equine medicine	18					18
Equine Orthopaedic	12					12
Equine Surgery	10				1	11
Infertility & Obstetrics	22					22
Neurology	12	9				21
Pig Medicine	13					13
Practice Management	6		5 seminars			11
Reproductive system pathology	4	2				6
Small Animal Medicine	16					16
Small Animal Orthopaedics	15	2				17
Soft Tissue Surgery	20					20
Urology	9	3				12
<b>Rotations</b>						
Equine Studies		16				16
Farm Animal		15				15
Gynaecology		8				8
Neurology		4				4
Radiography / Radiology		28				28
RSPCA				28		28
Path seminars			6 seminars (2 hr each)			12
VPH		2	14			16
Communication skills		3				3
<b>Total</b>	<b>215</b>	<b>113</b>	<b>31</b>	<b>28</b>	<b>5</b>	<b>392*</b>

\* Plus a 2-week seminar and practical-based module providing induction for the lecture-free final year

## Sixth Year Rotations

Subject	Hours of training					
	Lectures	Practical work	Supervised work	Clinical work	Other	Total
Small Animal Surgery				160		160
Small Animal Medicine				160		160
Farm Animal Medicine **				160		160
Equine studies				160		160
Anaesthesia				80		80
Radiology				80		80
Electives			320			320
<b>Total</b>			<b>320</b>	<b>800</b>		<b>1120*</b>

\* An "Emergency and Critical Care" rotation was introduced for the 2014-15 academic year (not included in the table) and is an additional 80 hours clinical work. This was previously part of Extra-Mural Studies.

\*\* The Farm Animal Medicine rotation includes a 2-hour seminar specifically on VPH.

Table 4.2a Curriculum hours in EU-listed subjects taken by each student

Subject	Hours in course					
	Lectures	Practical work	Supervised work	Clinical work	Other	Total
<b>A. Basic subjects</b>						
Anatomy (incl. histology and embryology)	68	136			44	248
Biochemistry and molecular biology	52	28			30	110
Biology (incl. cell biology) - pre entry requirements						
Biophysics - part of biochemistry and molecular biology)						
Biostatistics	10	4				14
Chemistry - pre entry requirements						
Epidemiology	10					10
Genetics - part of biochemistry and molecular biology						
Immunology	8	6				14
Microbiology	43	10	3			56
Parasitology	33	72				105
Pathological anatomy (macroscopic & microscopic)	66	100	11		20	197
Pharmacy	3					3
Pharmacology	45	39			20	104
Physiology	54	23			25	102
Physiopathology						
Scientific and technical information and documentation methods	6	14				20
Toxicology (incl. environmental pollution) - part of pharmacology						
<b>B. Animal Production</b>						
Agronomy	4	2				6
Animal behaviour (incl. behavioural disorders)	7	6				13
Animal husbandry (incl: livestock production systems)	48	22				70
Animal nutrition and feeding	22	4				26
Animal protection and welfare	8	3				11
Environmental protection	1					1
Preventive veterinary medicine (incl. health monitoring programmes)	3				10	13
Reproduction (incl. artificial breeding methods)	46	24			16	86
Rural economics					10	10

Table 4.2b Curriculum hours in EU-listed subjects taken by each student

Subject	Hours in course					
	Lectures	Practical work	Supervised work	Clinical work	Other	Total
<b>C. Clinical Subjects</b>						
Anaesthetics	16	4		80		100
Clinical examination and diagnosis and laboratory diagnostic methods		14				14
Clinical medicine	169	17		495		681
Diagnostic imaging	9	35		80		124
Obstetrics	21	5				26
Reproductive disorders						
State veterinary medicine, zoonoses, public health and forensic medicine	30					30
Surgery	64	6		252		322
Therapeutics	9					9
<b>D. Food Hygiene - for details see section 4.1.3</b>						
Certification of food production units	1	2	1			4
Food certification	1	2	1			4
Food hygiene and food quality (incl. legislation)	11	8	2			21
Food inspection, particularly food of animal origin	11	18				29
Food science and technology	3	2				5
<b>E. Professional Knowledge</b>						
Practice management	7		5			12*
Professional ethics	14					14
Veterinary certification and report writing	see notes below					
Veterinary legislation	8					8

## Notes

This is an integrated course and it is therefore difficult to allocate time in the manner required in these tables. The following should be noted:

- Teaching of practice management is introduced in the 5<sup>th</sup> year through a series of seminars; these build on the practical experiences that have been gained by students during their consultation sessions at the RSPCA clinic in 4<sup>th</sup> and 5<sup>th</sup> year and their EMS experiences (EMS has not been included in the above figures);
- State Veterinary Medicine, zoonoses public health and forensic medicine is taken to include roles of the Official Veterinarian, report writing, etc. They are

taught in lectures that specifically address those aspects (some of these lectures are provided by RCVS and DEFRA, e.g. in PfVP and VPH courses) and in lectures that include such considerations in a species/systems context. These latter include lectures within the Poultry Husbandry and Medicine course;

- Professional knowledge is taught throughout the course, beginning in the PfVP course in Year 2, and extending through into the 6<sup>th</sup> Year when students are beginning to take responsibility for individual cases;
- Veterinary certification and report writing are mainly dealt with in the 4<sup>th</sup> year VPH course (and subsequent VPH teaching in the following years) and in 6<sup>th</sup> Year when students are beginning to take responsibility for individual cases (completing horse passports is introduced in 4<sup>th</sup> year);
- Some microbiology is also taught in the systems courses in 4<sup>th</sup> year, and in 2<sup>nd</sup> year Biology of Disease (i.e. not just Principles of Infectious Diseases course in 4<sup>th</sup> year);
- Some immunology is taught in the systems courses in 4<sup>th</sup> year, and in the 2<sup>nd</sup> year Biology of Disease course;
- Pharmacy (as distinct from pharmacology and therapeutics), following a short introductory course, is distributed throughout the systems, discipline and species courses and is an integral part of 6<sup>th</sup> year;
- Cell Biology is taught in Years 1 and 2 in Homeostasis, Molecules in Medical Science, Biology of Disease, and Mechanisms of Drug Action, as an integral part of these courses;
- Scientific and technical information and documentation methods are integrated throughout the course, but there is a short introductory course, Introduction to the Scientific Basis of Medicine, in Year 1. This is also a particular feature of the Part II Tripos courses in Year 3. This is continued with the Evidence Based Medicine course in 4<sup>th</sup> year and the 6<sup>th</sup> year elective project;
- Physiopathology has no separate course but is an integral part of many others particularly Biology of Disease in Year 2, and the systems courses;
- Agronomy is dealt with in a lecture in the Principles of Animal Management course in Year 1 and also in Year 4 Integrated Animal Management. It is also part of the understanding to be gained from the preclinical EMS experience;
- Environmental protection is covered in the Principles of Animal Management (1<sup>st</sup> year) and Integrated Animal Management (4<sup>th</sup> year) courses and in the Veterinary Public Health course (4<sup>th</sup> year), and as part of other courses where toxicology and pharmacology are considered;
- Rural economics is not taught as separate lectures but is integrated into teaching in farm animal species. It is introduced in the Year 1 Principles of Animal Management course and then dealt with in many courses dealing with farm animal issues where experiences in preclinical EMS are discussed. Rural economics is further considered in the 6<sup>th</sup> year Farm Animal rotation;
- Obstetrics and reproductive disorders are taught as a single course (5<sup>th</sup> year), preceded by courses in Veterinary Reproductive Biology (2<sup>nd</sup> year), Animal Breeding (4<sup>th</sup> year) and Pathology of the Reproductive System (5<sup>th</sup> year);
- Therapeutics is integrated into all relevant teaching, so appears in systems courses, discipline courses and species courses, following the Mechanisms of

Drug Action (2<sup>nd</sup> year) and Principles of Clinical Pharmacology (4<sup>th</sup> year) courses;

- Veterinary legislation is mainly covered in the parts of the course where it applies and can be discussed in context; three other sessions are delivered by the RCVS Registrar during the 4<sup>th</sup> and 5<sup>th</sup> years;
- Veterinary certification is mainly covered in the Integrated Animal Management course (equine certification), the Veterinary Public Health course and in final year rotations.
- Toxicology is considered within a number of courses including species and systems with additional seminars in 5<sup>th</sup> year; aspects of toxicology are also considered in the Mechanisms of Drug Action course (2<sup>nd</sup> year).

Table 4.3. Curriculum hours in EU-listed subjects offered and to be taken as electives

Elective Topic	Hours in course					Total
	Seminars	Practical work	Supervised work	Clinical work	Other	
Anaesthesia	4		120	196		320
Small animal medicine / oncology / neurology	10	90	120	100		320
Small animal orthopaedics	2	5	120	193		320
Soft tissue surgery	9	12	120	179		320
Diagnostic pathology		200	120			320
Clinical pathology		200	120			320
Farm animal population medicine	30	25	160	75	30	320
Equine studies	20		120	180		320
Ophthalmology		50	120	150		320
Exotic Animals	12	188	120			320
Individual electives*						

\* Individual electives vary but will include the elements above but normally without lectures, although some students join the seminars from other electives. This category will include those students undertaking a research-based elective.

Details of student-selected studies such as the Part II (3<sup>rd</sup> year) and final year elective are given below. A summary of curriculum hours for the final year elective is given in Table 4.4.

Table 4.4 Curriculum hours in other subjects taken by every student

Subject	Hours in course					Total
	Lectures	Practical work	Supervised work	Clinical work	Other	
6th Year electives			320			320

## **Elective subjects:**

### **Pre-clinical course**

Year 3 (or Tripos Part II) is effectively an intercalated degree year. Students can elect to study a single subject chosen from the Natural Sciences, or from another Tripos. Some students choose to undertake a Part II in Management Studies or another discipline. There are many subjects available and a “Part II Fair” is held in Lent Term of 2<sup>nd</sup> year to advertise the range of courses available. Students are then asked to list their top three preferences in ranked order. Normally, the student is accepted on their first or second choice. (A range of this literature will be provided in the Visitation base room.)

Alternatively, students may opt to take Part II Biological and Biomedical Sciences. This involves selecting major and minor subjects from a prescribed list, and also producing a dissertation. Further information will be available in the base room.

In both cases, successful completion of the relevant examinations results in the award of the BA (Hons.) degree.

### **Clinical course**

During Year 6, eight weeks are devoted to an elective study. This enables students to study a subject of their choice in greater depth than is possible during the core course. A variety of subjects is offered by members of staff within the Department (see list below) but students are also free to arrange their own programme of elective study, provided that it is approved by the Director of Teaching.

The format of individual electives varies, and usually includes a mixture of formal tuition/seminars, practical clinical work, private study and project work. All electives require a written dissertation of 3,000 words, which is assessed together with a 15-minute oral presentation of the elective topic. A certificate of diligent attendance is also required from the elective supervisor.

#### 4.1.3 Further information on the curriculum

### **A. Basic subjects**

Formal instruction in the subjects in Years 1-3 is supported by supervisions organised by a Director of Studies at each student’s college.

The supervision system comprises small group teaching (in groups of 3 - 4) given weekly during term time in each main subject that the student is currently studying; these sessions require students to discuss and think about course material and to write essays, which permits them to reflect on and to synthesise information from the formal courses.

Study skills and IT skills develop through lectures and practicals, and also through the College supervision system, in which the students are encouraged to develop their own study methods, and through the use of the web for accessing libraries and

other sources of information. Communication and verbal skills are also acquired through College supervisions. They are further developed in small group teaching in 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> year courses. Many of these courses now have requirements for students to make presentations to their peers on subjects in which they have been engaged, in problem-based learning (PBL) sessions, journal sessions, research projects, etc.

Team working skills are developed in PBL sessions in 1<sup>st</sup> and 2<sup>nd</sup> year, in dissection groups in anatomy and in other small group teaching sessions (including College supervisions).

## **B. Animal production**

The teaching of animal production is delivered in the Principles of Animal Management (PAM) course in 1<sup>st</sup> year and the Integrated Animal Management (IAM) course in 4<sup>th</sup> year, together with further teaching in species courses in 4<sup>th</sup> and 5<sup>th</sup> year.

**Agronomy:** grassland management is introduced in the PAM course (1 lecture, 1 practical) and continued in the 4<sup>th</sup> year Integrated Animal Management course. This teaching is developed further in the farm animal and equine 6<sup>th</sup> year rotations.

**Animal husbandry (including livestock production systems):** an integrated PAM course is now part of the 1<sup>st</sup> year course (28 lectures, 8 animal handling practicals, 5 computer-assisted learning (CAL) units). The theoretical instruction is complemented by visits to the College of West Anglia for practical instruction in animal handling. These subjects are taken up again in the Integrated Animal Management course in 4<sup>th</sup> year and other general and species-specific teaching in the 4<sup>th</sup> and 5<sup>th</sup> year courses, when a variety of species is considered, including poultry and exotics in addition to the domestic species. Preclinical EMS is intended to consolidate students' understanding and practical skills in animal husbandry, as is their supervision of the lambing flock at the University Farm in 4<sup>th</sup> year.

**Animal nutrition and feeding:** an introductory course in nutrition is part of the PAM course (4 lectures, college supervisions, 1 practical and a series of CAL programmes on nutrition). Further nutrition teaching is given in the 4<sup>th</sup> year (16 lectures). From 2014-15, this has been incorporated into an Integrated Animal Management course.

**Animal behaviour:** the PAM (1<sup>st</sup> year) course introduces evolutionary development of behavioural patterns and the expressions of behaviour by a range of domesticated species. The scientific/neurobiological basis of behaviour is delivered as part of the 2<sup>nd</sup> year course Neurobiology and Animal Behaviour, and includes information on behavioural disorders and therapeutics – linking with teaching on the MODA course (2<sup>nd</sup> year) and forming foundations for clinical teaching in 4<sup>th</sup> year.

**Animal protection and welfare:** animal welfare is central to all our veterinary teaching and is considered part of almost every course. Specific teaching includes lectures in the 1<sup>st</sup> year PAM course, and in the 4<sup>th</sup> year Integrated Animal Management course (9 lectures, and 3 seminars).

**Environmental protection:** teaching covering environmental protection is given in parts of lectures in the 1<sup>st</sup> year PAM course, and where appropriate in the Integrated

Animal Management and Veterinary Public Health (VPH) courses in the 4<sup>th</sup> year. Legal aspects are also covered in the Veterinary Public Health course.

Preventive veterinary medicine (including health monitoring programmes): preventive medicine is taught as part of the species-specific medicine courses (2 specific cattle lectures, 1 specific sheep lecture, and parts of numerous others), farm animal rotations, the evidence-based medicine course, and in the 6<sup>th</sup> Year rotations (5 hours of seminar teaching, various online materials on CamTools, on-farm herd health investigations and reporting).

Reproduction (including artificial breeding methods): reproduction is introduced in the 1<sup>st</sup> year PAM course and in the 2<sup>nd</sup> year VRB course (24 lectures, 16 hours of practicals). Clinical teaching continues in the 4<sup>th</sup> year (Animal Breeding course: 19 lectures and 8 practicals, including rectalling classes) and 5<sup>th</sup> year in the Infertility and Obstetrics course (21 lectures; rotations, including rectalling classes), and forms a substantial part of the equine and farm animal final year rotations with 9 seminars and clinical work.

Rural economics: agricultural economics is covered in two lectures given in the PAM course. Economic considerations are also introduced into the IAM course and the farm animal final year rotation.

### **C. Clinical subjects**

The core curriculum in the 4<sup>th</sup> and 5<sup>th</sup> years is based on separate but related courses, some of which have a body systems basis, and some a discipline or a species basis. The courses are arranged in two dovetailing wedges of predominantly paraclinical and predominantly clinical teaching. Paraclinical and husbandry teaching predominates early in the 4<sup>th</sup> year, but gradually diminishes as the more clinical wedge of courses, which begins early in the 4<sup>th</sup> year, expands in the first two terms of the 5<sup>th</sup> year. This structure provides an overlapping and integrated progression from paraclinical to clinical training.

Integration of clinical teaching with basic science and paraclinical teaching is provided wherever possible and appropriate to encourage students to consider the clinical course as a whole rather than as separate paraclinical and clinical entities. Since 2012, this has been facilitated by restructuring the Biology of Infectious Diseases of Animals and Parasitology courses (together 75 lectures, 12 parasitology practicals) to a Principles of Infectious Diseases course (35 lectures, 5 practicals, 3 directed learning sessions), with other BIDD/Parasitology material becoming incorporated into systems or species courses. Further modification of this course occurred in 2014-15 to become a course of 36 lectures with 5 practicals and 3 directed learning sessions. Integration of basic, paraclinical and clinical teaching is also supported by 20% of 4<sup>th</sup> and 5<sup>th</sup> year devoted to small group teaching (rotations) and peer-teaching in 5<sup>th</sup> year (medicine demonstrations delivered by 6<sup>th</sup> year students).

Fourth and 5<sup>th</sup> year students rotate through a number of different disciplines in groups, normally of 6 or 8. These rotations provide an introduction to practical clinical work, complement the 4<sup>th</sup> and 5<sup>th</sup> year lecture courses, and prepare the students for EMS, which begins after the first term of the 4<sup>th</sup> year. 4<sup>th</sup> and 5<sup>th</sup> year rotations also provide a grounding for the final-year clinical work in the QVSH.

The 4<sup>th</sup> year rotations provide a wide variety of learning experiences: animal handling, lambing, basic clinical examination, radiography, necropsy work, communications skills, and basic clinical examination at the local RSPCA clinic. In the 5<sup>th</sup> year, this is expanded to include further work at the local RSPCA clinic, practical gynaecology and obstetrics, clinical pathology, and laboratory animal work. There are also classes on clinical examination, further communication skills, cattle foot-care, neurology, equine orthopaedics, radiology and radiography. Some rotation periods are devoted to self-directed learning. Drop-in sessions in the new Clinical Skills Centre were made available in November 2014, both within and outwith the timetabled rotation periods. The aim is that the Centre will provide enhanced opportunities for students to consolidate and improve skills learned during practical and rotation classes.

The 6<sup>th</sup> year rotations involve practical clinical work in a number of disciplines in the QVSH and in the equine and farm animal first opinion practices; students take personal responsibility for individual cases.

The final year was restructured as a series of rotations extending over 40 weeks, starting June 2014. This replaced the previous system where students conducted their rotations over 20 weeks (two, ten-week terms). This has resulted in improved student contact in the small animal clinic with smaller rotation groups spread over more of the academic year, maximising the teaching opportunities of the all-year-round caseload. This has also allowed introduction of an out-of-hours patient care rotation in place of the previous arrangements (which formed part of EMS). The equine and farm animal rotations have been retained in the academic term times but each is now split into two components, ambulatory first opinion practice and referral hospital cases (equine) and ambulatory farm animal practice and herd health/VPH (farm animal).

Thus the final year of the clinical course is devoted to clinical training in the QVSH and certain associated institutions. This period is essentially lecture-free, but small-group teaching sessions and seminars are provided within the clinical rotations. Students take individual responsibility for case management and client relations within a supervised and supportive environment, as part of rotation groups, normally of 6 or 12 in farm animal and equine rotations, groups of 3-4 in the small animal disciplines.

Rotations provide an opportunity for students to discuss issues with members of staff in small groups and individually. They also develop problem-solving and communication skills. As an example of how innovations are introduced into clinical rotations, the anaesthesia rotation is described below:

During the final year induction period (which is delivered after the VetMB Final Examinations Part II and before final year rotations start), the students are given an outline of the key theoretical points of the rotation, e.g.: risks of anaesthesia, the importance of pre-operative assessment and monitoring in risk management and decision-making. They also have practical sessions in anaesthetic machine set-up, choice and use of breathing systems and intravenous catheterisation.

The rotation period is of two, one-week rotations separated by a number of weeks (to allow reflection and consolidation of practical skills via the Clinical Skills Centre). As a new departure introduced in 2014, the students are given a pocket-sized

Handbook of Clinical Anaesthesia. This covers pre-anaesthetic assessment, risks and anticipated problems (a “crisis manual”), various checklists and an anaesthesia-related formulary, and is a novel introduction to the Cambridge final year rotations. The handbook has a QR code, allowing students to download it onto their personal hand-held device and have it with them at all times.

In the first rotation week, the students are given a brief orientation session on the first morning and then are given preoperative assessment sheets and asked to examine a patient in a structured fashion. On the basis of this examination they are asked to devise an anaesthetic plan, which is then discussed with the anaesthetist they will be working with on the case. At the end of the anaesthetic period the student formulates an immediate recovery plan to facilitate transfer of the patient to recovery and back to the wards. This format continues throughout the whole rotation with the students working generally on a one to one basis with an anaesthetist. Feedback is offered to the student after every case (in a “what went well, what could be improved, what the student needs to read up on” format) and further feedback is given during the rotation if the overall performance of the student is below what is expected. At the end of each day, depending on the caseload, one member of staff brings the whole group together for a seminar session, often combined with the out-of-hours rotation students. Topics covered include cardiopulmonary resuscitation, fluid therapy, breathing systems. Cases are also discussed if there is a particularly good example. At the end of the week the students give a 10-minute presentation of a case they have anaesthetised during the week, as a formative exercise, with feedback.

The second rotation week is of a similar format as week 1 but the staff expect the students to increase the degree of responsibility they take for each case. The aim is for each student to conduct approximately 10 anaesthetics during their placement, to include feline, canine, large animal and rabbit cases, and to anaesthetise (unaided) and monitor a dog undergoing a dental procedure. At the end of the rotation the students prepare another 10-minute presentation on a topic of their choice, which is formally assessed and marked.

The anaesthesia rotation is now linked with a new, separate emergency critical care / out-of-hours rotation, again of two, 1-week blocks, organised by Board-certified anaesthetists. Collectively, this provides the students with two, two-week rotations in anaesthesia/critical care, doubling the previous provision.

Also during the 6<sup>th</sup> year, 8 weeks are devoted to an elective study of their choice (see section on elective subjects, above).

Clinical EMS exposes students to the practical, ethical, financial, managerial and inter-personal aspects of professional practice, building on the seminars provided on these matters in 4<sup>th</sup> and 5<sup>th</sup> years.

Students learn through a range of activities including lectures, practical laboratory work, assignments, practical work in rotations, small-group teaching, seminars, experiential learning, electives and EMS, supplemented by self-learning and CAL, and presentations that are posted on CamTools. Lectures are normally extensively illustrated and supported by handouts indicating aims and objectives, core material and material for further study. Laboratory practicals have a variety of formats including demonstrations, problem-solving exercises and report writing, and involve

both paraclinical and clinical teaching staff where appropriate. An interactive teaching approach is encouraged.

Online resources are used as a support for veterinary teaching. Examples of these include:

- WikiVet, an innovative on-line encyclopaedia of veterinary subjects, modelled on the Wikipedia concept and initially based on pathology, which is available to all students. (<http://www.wikivet.net/>):
- The online veterinary anatomy museum (OVAM; [www.onlineveterinaryanatomy.net](http://www.onlineveterinaryanatomy.net)), a collection of anatomy resources based at RVC and organised into categories according to the species, system and region covered; original high resolution images of the museum's assets and source files for audio-visual are available to partner organisations;

The pre-clinical course materials at Cambridge also remain available to clinical students via the student-created Landscape document, available via CamTools and Moodle.

#### **D. Veterinary Public Health (including Food Hygiene)**

The World Health Organisation (WHO) defines Veterinary Public Health as "the sum of all contributions to the physical, mental and social well-being of humans through an understanding and application of veterinary science". This definition encompasses all activities carried out by veterinarians with all animal species and human interactions in the context of the environment in which they live and share. Therefore each veterinarian, arguably, one way or another, contributes to VPH. However, this section focuses on VPH in the context of meat hygiene/quality and food safety.

The Veterinary Public Health (VPH) course at the Department of Veterinary Medicine, University of Cambridge aims to provide a functional understanding of the ways in which veterinary skills, knowledge, and resources contribute to the protection and improvement of human health. Emphasis is also placed on bringing together the teaching from other relevant disciplines including animal health and husbandry, medicine, pathology, microbiology, parasitology, and epidemiology. VPH teaching is therefore integrated within many other subjects leading to achievement of the required RCVS Day One Competences. The Final VetMB Part III Examinations include a specific section on VPH that must be passed for the student to be allowed to graduate.

Within the overall curriculum, identifiable VPH teaching starts in a year one with further teaching in year 2 with the core course delivered in 4<sup>th</sup> year. The core teaching includes a compulsory 1-day visit to red and white meat abattoirs, a cutting plant and a meat preparation and meat product premises during the Lent term followed by a 1-week compulsory red meat abattoir placement at the end of Easter term.

Further smaller group seminars with interactive teaching are carried out during the 5<sup>th</sup> and 6<sup>th</sup> year and include further meat inspection/hygiene practicals. Further to this, arrangements have been made to take students from 2015-16 to family owned

farm, red meat abattoir, cutting plant with a retail unit that includes in-house processing to meat preparations and meat products.

### Teaching staff

The VPH course is taught mainly by two University full-time staff, supported by a number of visiting lecturers from the UK Central Competent Authorities and an Associate Lecturer. During the visits to external plants (above), Official Veterinarians and Meat Hygiene Inspectors also provide local teaching support. Full-time VPH lecturers at Langford, Bristol, carry out the compulsory 1-week abattoir training.

A summary of the VPH teaching for each student (in hours) is given in the following table.

Year of study	Lectures	Supervised / self-directed work	Practicals
1 <sup>st</sup> year	1 (in PAM course)	0	0
2 <sup>nd</sup> year	5 (PfVP course): 3 from Dept. staff 2 from external (APHA) lecturers	Supervised (PfVP course) <b>2 hr</b> – “Meet the client session” e.g. either slaughterhouse operator, policy or some other VPHA clients	3 (PfVP course) Post mortem room
3 <sup>rd</sup> year	0	0	0
4 <sup>th</sup> year	35: Majority delivered by Dept. staff. Some provided by external lecturers	Supervised – 4 group discussions at Langford placement Self-directed – 5	30 3x7 – Langford 1x3 – Cambridge 1x6 – Commercial plant (red& white)
5 <sup>th</sup> year	0	Supervised – 4 Small group rotation Self-directed – 10	2
6 <sup>th</sup> year	0	0	<b>2</b> (interactive practical seminar )
TOTALS	41	25 – SUPERVISED (seminars) and SELF DIRECTED (preparing essays/ post mortem reports)	<b>37 – PRACTICALS</b>
TOTAL VPH (TITLED) TEACHING HOURS = 103 Excludes other aspects of relevant VPH teaching carried out during specific farm/companion animal lectures and rotations (not titled as VPH), e.g. on zoonoses (food producing/small animal), epidemiology, pathology, microbiology etc.			

A short description of the delivery of VPH teaching is as follows:

**Year 1** (delivered and counted in PAM): Introductory lecture on VPH (national and global players) including zoonoses and Health and Safety.

**Year 2** (delivered and counted in PfVP):

- **Lectures:** Further lectures on VPH, food hygiene, State Veterinary Medicine, relevant Competent Authorities including Veterinary Agencies, surveillance. International control
- **Practical:** ½ day practical in the post-mortem room, introducing abattoir pathology (wet specimens), group work and problem solving.
- **Supervised:** “meet the clients” seminar, e.g.: slaughterhouse worker, policy maker.

**Year 4** (core VPH course of 35 Lectures):

- **Lectures:** Non-comprehensive list of the examples are: human-animal-environment interactions, global, national and international VPH players, all type of zoonoses, e.g.: occupational, food borne, small, large animal etc., veterinary legislation on public health (including food safety), animal health and welfare (farm, transport, slaughter), notifiable diseases, emerging diseases, surveillance, residues, certification, slaughterhouse / food production hygiene, food technology, spoilage, OV Tasks (Inspection & Auditing), Other Products of Animal Origin (OPOAO)e.g.: eggs, cheese, honey, fish, etc.
- **Supervised/self-directed work:** Seminar discussions and reports writing as part of the Langford Abattoir Practical Course
- **Practical teaching:**
  - **In-abattoir practical teaching: large group** introductory 1 day (red & white meat slaughterhouse, cutting plant, meat preparation and meat product premises) during VPH core course followed by:
  - **In-abattoir practical teaching; small group** 1 week arranged with Bristol Veterinary School Langford Abattoir. Alternatively, in special circumstances 3 weeks practice with a veterinarian who provides OV duties and regularly attends an abattoir will be accepted with adequate documentation. Students are required to produce written reports (3,000 words) on this practical experience (an essay and a report pathology specimen). See below for further details.
  - **Post mortem room:** Meat hygiene and inspection practical: ½ day, group-based exposure to abattoir pathology (wet specimens), inspection, problem solving and presentation

**Year 5**

- **Supervised/Self-directed learning:** preparation of material for VPH rotation (problem based learning and group presentation). Includes complex VPH scenarios to work individually (and in groups) in Michaelmas Term and individual work on a specific complex issue in Lent and Easter Terms. Students are assessed on written and verbal skills.
- **Practical teaching:** Abattoir pathology (wet specimens) in the post mortem room, meat hygiene and inspection.

## **Year 6**

- **Supervised:** Problem-based real-life interactive seminars delivered as part of Farm Animal Studies rotations. Focusing on problem solving, judgements, decision-making and the impact and justifications for animal, public health and welfare. Communication skills.

### **Teaching material availability**

Teaching material consists of lecture handouts given at the time of lectures and it is available at the CamTools website. The students have available links to relevant up-to-date Meat Industry Guides and the Manual for Official Controls, which include guides and veterinary legislation, etc. A number of relevant reference books/guidance is available from the Departmental library.

### **SPECIFIC INFORMATION ON THE PRACTICAL TRAINING OF VETERINARY PUBLIC HEALTH (INCLUDING FOOD HYGIENE)**

#### **One-week compulsory abattoir placement**

Strong links are maintained with the Veterinary School at Bristol (Langford) which has an approved red meat slaughterhouse, a cutting plant and meat preparation facilities. Cambridge students, in small groups (up to 5 students), spend a 1-week compulsory placement at Langford premises.

This arrangement was developed in 2011 following difficulties encountered by students in obtaining abattoir and resulted in a change in practical teaching of abattoir practice. Students spend one week at the abattoir at Langford, University of Bristol, where they receive structured training. This is conducted in the summer vacation between 4<sup>th</sup> and 5<sup>th</sup> years and is a compulsory part of the course. Attendance is recorded and three pieces of written work (1 essay and 2 reports on abattoir specimens) are formally assessed.

The teaching starts early Tuesday morning and lasts until Friday, when each student is given the two assignments to complete as written reports. One assignment is of two reports on post mortem pathology specimens observed during the week, and the other assignment is an essay on a broader VPH subject. The students submit their reports to Bristol lecturers for marking on a pass/fail basis within 4 days of the placement. Those students who fail the assignments must repeat them following remedial work in the post mortem room at Cambridge with Departmental teaching staff, to learn and discuss the issues until they achieve and demonstrate a satisfactory level of knowledge.

Langford abattoir is approved to slaughter all red meat species (cattle/sheep/pigs/sometimes goats). During the week's placement the students are actively involved in relevant theoretical and practical veterinary tasks. This includes ante/post mortem inspection tasks, auditing, Animal-by-Products (ABP) (identification, separation, categorisation, staining), health marking, slaughter processing hygiene and structure assessments. Uniquely, each student is given an opportunity to use the captive bolt pistol on bovine heads detached (or exceptionally on pig heads). Some groups may also be involved/observe making meat preparations, e.g.: sausage making.

## **Other arrangements in place with industry in East Anglia**

The Department has also strong links with local abattoirs in East Anglia, to mutual benefit. For example the Department undertakes ad hoc provision of investigative pathology and advice in response to abattoir requests, and this has raised our standing and value to them. In return, we receive teaching access, fresh teaching and research material and material for case studies (hygiene, meat quality, pathology, welfare issues).

Due to the commercial realities in the recent years there have been some difficulties in finding local abattoirs and food processing facilities that are willing to take relatively large numbers of students on visits. Not all food premises have facilities to permit on-site teaching of large numbers of students.

Nevertheless, arrangements have been made for 4<sup>th</sup> year students to visit the following approved food premises during their core VPH teaching, starting 2014-15:

- C&K Meats, Eye (70 miles): approved red meat slaughterhouse, cutting plant, meat preparation and meat product premises.
- 2 Sisters, Flixton (90 miles): approved poultry slaughterhouse and cutting plant.

Arrangements have also been made to conduct small group “Integrated farm to fork” teaching, planned for 2015/16 for 6<sup>th</sup> year students. The following place is willing to take students and provides such an opportunity:

- C Humphreys & Sons, Chelmsford (50 miles): a family-owned farm, red meat abattoir (cattle/sheep/pigs), cutting plant with a retail unit selling all Products of Animal Origin (POAO) e.g. cheese, honey etc. The butcher shop also makes meat preparations and meat products. The abattoir has become a regular pathology specimen supplier.

## **Online materials**

All teaching material is available for review on the Moodle (PAM, PfVP) or CamTools (clinical teaching) websites. Additional material on CamTools includes:

- Revision quiz on meat hygiene;
- Revision quiz on wildlife associated zoonoses;
- Information, including sample examination papers, on preparing for the Part I and Part III examinations in VPH.

Multiple copies of the updated CD-ROM of the Meat Hygiene Service Official Manual of Controls and the Meat Industry Guide are available from the Departmental library.

## **E. Professional knowledge**

Although the first part of the course at Cambridge has a strong scientific emphasis, in the first two years it is considered important that students understand that they are preparing for a vocational career.

A course for veterinary students called Preparing for the Veterinary Profession is an integral part of the pre-clinical curriculum. This course is delivered in the 2<sup>nd</sup> year

(MVST Part IB) but strands such as communication skills and professional ethics run through to the 4<sup>th</sup> and 5<sup>th</sup> year to provide continuity between preclinical and clinical years. The course aims to enable veterinary students to understand the wider role of the veterinary profession in society, to have an introduction to the alternatives to veterinary practice as a career and to discuss the ethical, professional and social responsibilities of the profession. Active discussion and debate are encouraged and the course covers such areas as: veterinary history; alternatives to practice (research, Government agencies and the pharmaceutical industries); veterinary ethics, regulation and compensation; the human-animal bond (building on consideration of animal ethics and welfare that have been introduced in the Principles of Animal Management course in 1<sup>st</sup> year (MVST Part IA)); public health, food safety, zoonoses and government agencies, and communication and management skills. Professional ethics are further considered at the end of 5<sup>th</sup> year in seminars provided by RCVS, as students begin to prepare for their lecture-free final year.

On entry to the clinical course students are given advice about their professional responsibilities in a two-day induction programme. Professional knowledge is then an integral part of the course: it is a particular feature of EMS preparation, of the course introducing 5<sup>th</sup> year students to the lecture-free final year, and of student experience in working in the clinics of the QVSH.

Gaining insight into practice management is a stated objective of EMS. It is addressed during specific Practice Management Seminars' in 5<sup>th</sup> year and when students visit the RSPCA clinic during their rotations. Students are encouraged to attend the SPVS conference for final year veterinary students on practice issues.

As with many other topics, veterinary certification and report writing are integrated into the rest of the curriculum. For example, equine passports and certification of horses for soundness is dealt with in the equine courses, and food certification in the Food Hygiene course. Report writing permeates the whole of the clinical course from post-mortem reports in the 4<sup>th</sup> year to written discharge instructions for owners and letters to practitioners regarding referred cases in the 6<sup>th</sup> year. These reports are monitored by academic staff, and advice and tuition is given individually.

Veterinary legislation is generally taught as part of the subject to which it applies, as legislation means little to veterinary students unless presented in context. It features largely in the VPH course and also in Clinical Pharmacology teaching.

### **Compulsory attendance by students**

When students sign the Veterinary Students Register (initially in 1<sup>st</sup> year and again in 4<sup>th</sup> year) they undertake to apply themselves satisfactorily to their studies and they are informed that regular attendance at all teaching sessions is expected. Attendance at preclinical practical sessions is monitored, and failure to attend is notified to the individual student's College. Attendance at all clinical rotations in the 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> years is compulsory. Attendance is verified by the requirement for a signature in the student's 'black book' from the member of teaching staff running the rotation. There are published guidelines regarding absence through sickness and requirements for remedial action or repetition of rotations.

This information is also provided to students through timetabled induction sessions and through the Veterinary Student Handbook (pre-clinical course) and Curriculum Documents (clinical course).

#### 4.1.4 Obligatory extra-mural work

Details of the compulsory period spent at the Langford abattoir, Bristol are given in section 4.1.3.

Obligatory extramural work that students must undertake as part of their course complies with the RCVS Guidance on Extra-Mural Studies and can be summarised as:

<b>Nature of work</b>	<b>Minimum period</b>	<b>Year of the course in which work is carried out</b>
Preclinical EMS	12 weeks	1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup>
Clinical EMS	26 weeks	4 <sup>th</sup> , 5 <sup>th</sup> and 6 <sup>th</sup>

- Twelve weeks of work on farms or other animal management related establishments approved by the tutorial office, Veterinary School Clinical Supervisor (VSCS) and pre-clinical EMS co-ordinator;
- At least 10 weeks to be spent in the British Isles on establishments working with horses, cattle, sheep, pigs and dog/cats. Minimum period of 2 weeks with of these main species. It is also recommended that the sheep experience includes a period of lambing;
- The remaining 2 weeks can be spent on further farm work or in a kennels or catteries; zoo or wildlife parks in the UK; poultry farms; laboratory animal facilities or farms overseas.
- Pre-clinical EMS must be performed after matriculation and after a compulsory introductory health and safety instruction and completion of an Animal Management and Husbandry Online Placement Tool;
- Pre-clinical EMS to be completed before entry to the 4<sup>th</sup> year.

Students have an introductory lecture on pre-clinical EMS as part of the 'Principles of Animal Management Course' and are supplied with a booklet 'A guide to Extramural Studies for Preclinical Veterinary Students'.

These elements ensure that pre-clinical EMS achieves its goals of providing students with practical experience of animal management, husbandry and handling of farm animals while retaining a reasonable degree of flexibility for gaining experience with the practical management of other non-farm species.

Since the last visitation, the Department's Tutorial Office has taken over the administration of preclinical EMS, organising a database of placements and sending necessary paperwork and information to establishments in advance of student placements.

The Tutorial Office maintains a database of around 350 preclinical EMS placements that have been approved and which fulfil our required health and safety and insurance conditions. Any new placement suggested by the students is contacted

prior to the placement and sent paperwork explaining these and the aims and objectives of preclinical EMS. The placement then sends back their details and if they have given their permission for their contact information to be given to all students, they are then added to the preclinical EMS database.

Students are required to complete a risk assessment form for any preclinical EMS placements abroad or any placements in zoos or safari parks within the UK. This is discussed with their Veterinary School Clinical Supervisor (VSCS) who provides feedback and approval before submission to the Tutorial Office.

Since the last Visitation in 2008, the VSCS system has been extended to include preclinical as well as clinical EMS. Each student is assigned a Veterinary School Clinical Supervisor (VSCS) from the beginning of the first year, who meets with the student individually 3 times a year to discuss EMS. Attendance at these meetings is required to be certified and students are required to show evidence of attendance at these meetings before progression to the fourth year. The VSCS is responsible for guiding their students' EMS throughout all 6 years of the course, thus providing continuity. The VSCS advises on the requirements of the EMS regulations, suitable placements, and placements abroad. EMS assessments are forwarded to the student's VSCS for feedback to the student should any remedial action be required. VSCSs also provide an electronic report to Colleges (through CamCORS) on each student's progress with EMS, so that support mechanisms in Colleges are kept fully informed. They also oversee student welfare and academic progress in the clinic years. VSCSs are required to be MRCVS and members of the Department of Veterinary Medicine.

Students have to obtain a signed certificate from each placement. The cohorts due to graduate in 2019 and 2020 are also trialling the new RCVS online Student Experience Log for their preclinical placements. Students also have to complete a single sheet summary of around 500 words using the format detailed in the booklet for each pre-clinical placement attended. All reports must be submitted to the student's VSCS for assessment and feedback at the regular timetabled VSCS meetings and subsequently to the Tutorial Office, which maintains a record for each student. From October 2014, 1<sup>st</sup> year students must complete the new Edinburgh-hosted "Animal Management and Husbandry Online Placement Tool" before doing their first placement, available via a link on the student pages of the Department's website ([www.vet.cam.ac.uk/inform/ems/emsd](http://www.vet.cam.ac.uk/inform/ems/emsd); Raven password required).

Clinical EMS may not begin before the Michaelmas Term of the 4<sup>th</sup> year. The basic 26 weeks clinical EMS requirement must be completed before entry to the Final Veterinary Examinations Part III. Clinical EMS requirements have been revised since the last visitation in 2008 to take in to account the recommendations of the RCVS Policy and Guidance issued in 2009. The aim is to make EMS as flexible as possible while still ensuring that students gain sufficient experience of the main veterinary species and UK practice.

The stipulations for clinical EMS made by the Department are:

- Students must complete the "EMS Driving Licence" before undertaking any clinical EMS (available via the Department's website)
- The first 6 weeks of clinical EMS should be in 3 blocks of 2 weeks each of first opinion UK practice in a variety of species ('preparatory EMS'). It is

hoped that at least one of these practices may become a 'base practice' to which students return during the clinical course.

- The remaining 20 weeks can be spent in a variety of veterinary practices and activities in the UK and abroad. In order to ensure day 1 competences, students are asked to spend at least 4 weeks in predominantly farm animal practice (including 2 weeks of cattle); 4 weeks in predominantly small animal practice and 4 weeks in equine practice.
- Students can include one week at an APHA (formerly AHVLA) regional laboratory. This is no longer compulsory but is strongly recommended particularly for students interested in a career in large animal practice.
- Abattoir work is no longer part of obligatory EMS because a week at Bristol is now part of intramural teaching. However, students are encouraged to consider further weeks at an abattoir or with the State Veterinary Service as part of EMS.
- Conference attendance at certain stipulated conferences can count for up to 5 days of EMS, provided the student can provide evidence of attending lectures.
- No more than 4 weeks EMS at this veterinary school (which includes elective work) can be counted.
- Students can include no more than 6 weeks abroad in the minimum 26 weeks total.

Assessment of EMS is by means of certificates of attendance and by feedback forms (a) from the EMS teacher reporting upon the student and (b) from the student reporting on each EMS experience.

The VSCS and EMS Co-ordinator are informed of any negative feedback from practices of students and take appropriate action, which usually involves discussion of the problems encountered with the student. The EMS Co-ordinator will usually also contact the practice.

Records of each individual student's EMS are retained by the Academic Support Officer and the student concerned, and are reviewed by the Veterinary School Clinical Supervisors (VSCS) at their termly meeting with each student. Individual students record their practical experiences in their Clinical Checklist ('black book') and this is then used as a guide to planning further EMS and reviewing their progress in relation to attaining day one competences. The years of 2016 and of 2017 are trialling the new RCVS on-line student experience log alongside their 'black books'.

Further details of compulsory extra-mural studies are detailed in SER 1 Chapter 14.

#### 4.1.5 Specific information on the practical training in food hygiene/Public Health

Specific information relating to VPH teaching in the curriculum, and on distances to abattoirs has been given in section 4.1.3 (above).

## 4.1.6 Ratios

### 4.1.6.1 General indicators types of training

	Indicator (Ratios)	Denominator
R6:	Theoretical training (A+B+C) $\frac{1273}{1329} = \frac{1}{1.04}$	: 1.04
R7:	Supervised practical training (D+E+F) Clinical work (F) $\frac{924}{404} = \frac{1}{0.44}$	: 0.44
R8:	Self directed learning (C) $\frac{476}{2974} = \frac{1}{6.25}$	: 6.25
	Teaching load (A+B+C+D+E+F+G)	

### 4.1.6.2 Special indicators of training in food hygiene/public health

	Indicator (Ratios)	Denominator
R9:	Total no. curriculum-hours Food hygiene/Public Health $\frac{103}{2974} = \frac{1}{28.87}$	: 28.87
R10:	Total no. hours vet. Curriculum Total no. curriculum-hours Food hygiene/Public Health $\frac{\text{Hours obligatory extramural work in Veterinary inspection}}{\text{Total no. curriculum-hours Food hygiene/Public Health}} = \frac{\text{Hours obligatory extramural work in Veterinary inspection}}{\text{Total no. curriculum-hours Food hygiene/Public Health}}$	: see notes

#### Notes on ratios

R6: The figure of 1.04 is above the RCVS established range of 0.51-.036, indicating that the curriculum is a practical-rich course. The 3<sup>rd</sup> year (Part II), College

supervisions and the lecture-free final year (supervised practical training) have not been included in calculations but increase the practical component of the curriculum.

R7: The figure of 0.44 is below the RCVS established range of 1.88-2.21 (i.e. “better” than the established range), reflecting the high level of practical training (e.g. lecture-free final year but also the 4<sup>th</sup> and 5<sup>th</sup> year clinical rotations) in the curriculum.

R8: The figure of 6.25 is within the RCVS established range of 0.51-7.87.

R9: The RCVS does not have an established range of denominators.

R10: There is no obligatory extramural work in veterinary inspection in the Cambridge curriculum as it has been incorporated into the core course (1-week placement at the abattoir at the Veterinary School in Bristol plus visits to more local slaughterhouses), as detailed in section 4.1.3. Students are encouraged to gain further experience during their Extra-Mural Studies but that is not compulsory. There is no established range of denominators for R10.

## 4.2 Comments

The Department is content with the ratios R6-R10.

The stated aim of the curriculum is to prepare students to undertake any branch of the profession and to be able to undertake continuing professional development in their chosen speciality. We believe that the curriculum achieves its stated aim.

The curriculum is structured to address the aims and objectives described in SER 1 Chapter 2 and in SER 2 Chapter 1. It is continuously reviewed by the Teaching Strategy Committee and Veterinary Education Committee with input from all staff via the Teaching Group Meeting Group, students through the Student Consultative Committee, external examiners, external review bodies such as the RCVS, internal University Teaching and Learning Review, and taking account of changing conditions in the profession as a whole.

Recent major developments include the introduction of a 40-week final year with smaller group sizes in the small animal rotations, expanded clinical rotation preparation week at the end of 5<sup>th</sup> year; the restructuring of the final year electives; introduction of a Medical and Veterinary Student Progress Panel and restructuring of Fitness to Practise monitoring.

Local conditions affect the course in a number of ways. East Anglia is not an area with large numbers of dairy cattle. However, due to a highly successful programme of recruiting new clients, the number of farm animal clients has increased substantially over the past 2 years to over 80 clients. In addition, the University Farm has, as one of its stated objectives, the provision of clinical teaching material for the Department, in particular through its 200 cow dairy unit. In addition to this valuable resource, making best use of all cattle teaching material local to Cambridge has been achieved by providing much of the cattle teaching through ambulatory rather than hospitalised cases. This has substantially improved and broadened intramural exposure of students to first-opinion cases in cattle, sheep, goats, pigs and alpacas (including the “hobby farmer”) while retaining larger herds that act as a focus for teaching of herd health. In this way, farm animal teaching at Cambridge is

relevant to the types of cases new graduates in mixed/farm animal practice commonly experience, together with an understanding of how to devise and implement herd/flock health schemes.

There is intense competition in East Anglia for equine clients, particularly in the competition/racing sectors. The Cambridge Equine Hospital has continued to focus on provision of a first opinion ambulatory service, with internal referral. The practice has grown substantially over the last 5 years, also providing access to the types of case generally seen by recent graduates in practice in the UK.

Further details of the Cambridge Equine Hospital and Cambridge Farm Animal Veterinary Services are given in SER 1 Chapter 7.

The final year was restructured as a series of rotations extending over 40 weeks, starting June 2014. This replaced the previous system where students conducted their rotations over 20 weeks (two, ten-week terms). This has resulted in improved student contact in the small animal clinic with smaller rotation groups spread over more of the academic year, maximising the teaching opportunities of the all-year-round caseload. This has also allowed introduction of an out-of-hours patient care rotation in place of the previous arrangements (which formed part of EMS). The equine and farm animal rotations have been retained in the academic term times but each is now split into two components, ambulatory first opinion practice and referral hospital cases (equine) and ambulatory farm animal practice and herd health/VPH (farm animal).

A new Clinical Skills Centre became available in October 2014. This will facilitate a greater range of training and practise in practical clinical skills earlier in the clinical course (4<sup>th</sup> and 5<sup>th</sup> year) allowing students to gain greater confidence before they enter final year and on EMS. An academic member of staff has been appointed as Clinical Skills Centre Coordinator and a veterinary nurse-qualified facilitator will also be appointed to support the Centre's role in student education.

A Professional and Clinical Skills course will be introduced by the 2016-17 academic year. This will consolidate and integrate the current teaching in professional ethics, communication skills, professionalism, business/practice management and practical skills. The course will extend through all 6 years of the course, using innovative methods of assessment within a cumulative portfolio.

Appointment of a new Teaching Fellow in Veterinary Public Health was made in September 2014. This will lead to redevelopment of the VPH course with increased visits to abattoirs and food processing plants, and increased submissions of abattoir material for pathology teaching at the vet school. This strategic appointment has strengthened the teaching of VPH and has led to developments in the VPH course, with improved integration of teaching across year groups.

A further strategic appointment, of a Senior Teaching Associate – Curriculum & Innovation, started in October 2014. This is a key appointment in developing the veterinary course and assessment methodologies; this Teaching Officer chairs the Teaching Strategy Committee's working party on developing the Professional and Clinical Skills course.

Stronger links between the Department and those departments providing teaching in the MVST Tripos, and with the Clinical School, have been developed by the Director of Teaching in the past year. These have facilitated improvements in the PAM and NAB courses through: migration of subject material to more appropriate locations in the curriculum and strengthening the teaching in behavioural neuroscience; greater representation of veterinary-qualified staff in BOD (pathology) practicals, development of veterinary-related scenarios for small group teaching in MODA and MIMS courses; refocusing of the PfVP course into three clear themes; and future collaborative teaching of themes relating to professionalism and professional ethics.

#### 4.3 Suggestions

We have no suggestions

## CHAPTER 5

### TEACHING, QUALITY AND EVALUATION

#### 5.1 Factual information

##### 5.1.1 The teaching programme

The preclinical course occupies the first three years. Years 1 and 2 (Parts IA and IB) largely comprise core teaching while Year 3 (Part II) is the equivalent of an intercalated degree year and is taken by all veterinary students except those with a previous degree in a biological science (affiliated students). Years 4-6 comprise the clinical course.

A summary of the 6-year course is given in Appendix 3.

The preclinical course is overseen by the Medical and Veterinary Sciences Tripos Part I (MVST I) Committee on behalf of the Faculty Board of Biology. The Director of Education in the School of Biological Sciences chairs the MVST I Committee and sits on the Faculty Boards of Biology and Veterinary Medicine. Co-ordination between the two parts of the course is the remit of the Veterinary Education Committee (VEC), which draws members from all of the above committees and Faculty Boards.

#### **Coordination of the preclinical curriculum**

The coordination of the activities of the individual Departments and Colleges involved in the first three years of the course is the responsibility of the Director of Education in the School of Biological Sciences. This is achieved through the MVST I Committee which is the body responsible for overseeing teaching in the MVST. The committee is chaired by the Director of Education in the School of Biological Sciences and includes individual course organisers as members. Thus, in terms of veterinary education, the Director of Education and the MVST I Committee are responsible for:

- the development and implementation of the decisions of the MVST I Committee and the Faculty Board of Biology about all aspects of medical and veterinary education;
- liaison with the Dean/Deputy Head of Department and the Director of Teaching in the Department of Veterinary Medicine in co-ordinating veterinary education;
- liaison with College bodies such as the Senior Tutors' Committee, and the committee of Directors of Studies in Veterinary Medicine.

Within the Faculty of Biology, each Department has a Teaching Committee (normally chaired by that Department's Deputy Head of Department for Teaching, or equivalent) whose membership includes staff involved in the day-to-day running of the course. The Veterinary Clinical Anatomist or the Department of Veterinary Medicine's Director of Teaching is a member of most of these course committees and both are members of the MVST I Committee. Departmental committees report to the MVST I Committee that exercises, through its inter-departmental course panels,

a management function in reviewing the curriculum and assessment for the entire course.

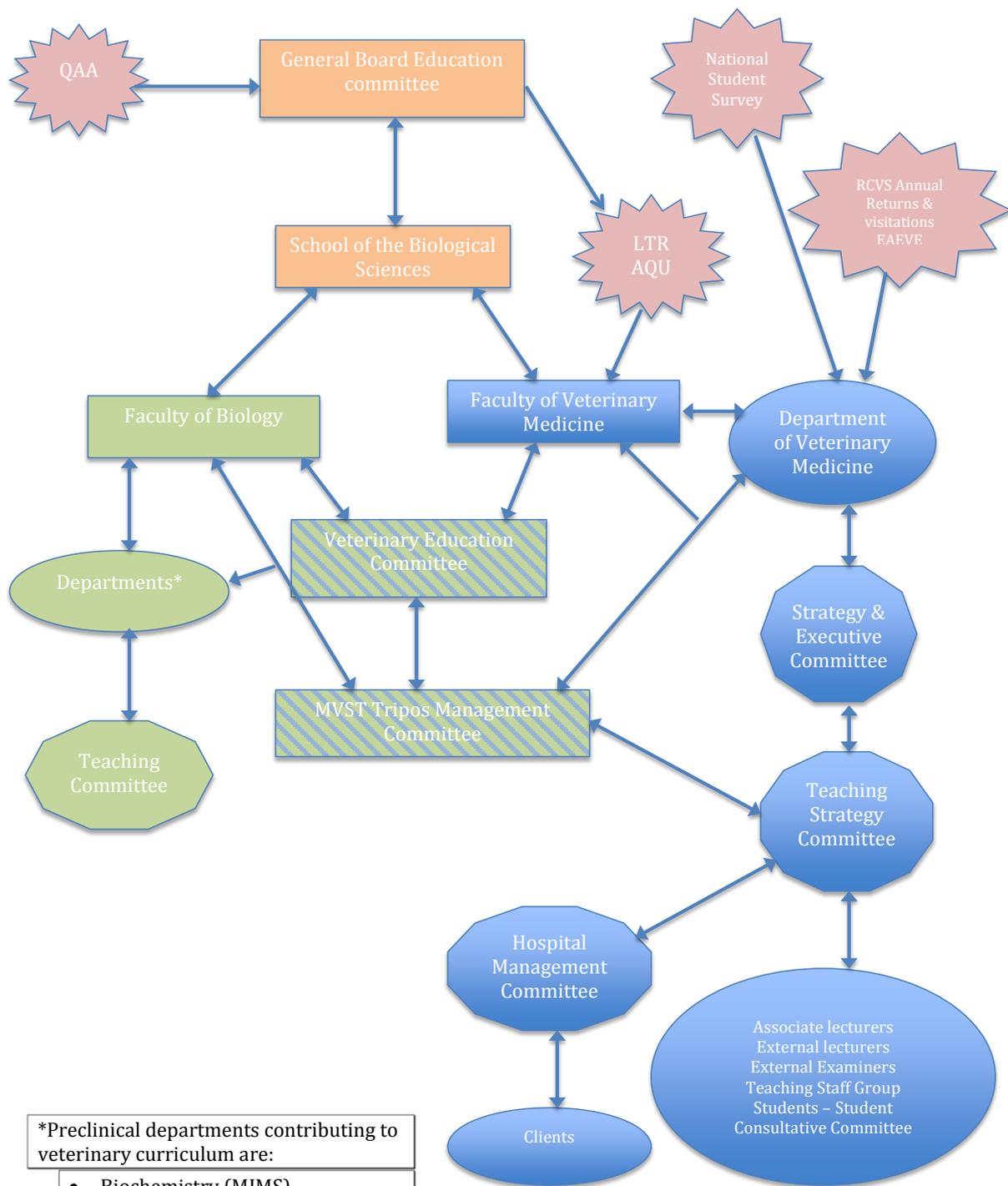
Departmental Committees in the Faculty of Biology and the MVST I Committee all include student members.

### **Coordination of the clinical curriculum**

The Director of Teaching in the Department is responsible for the oversight and management of the clinical curriculum, on behalf of the Faculty Board of Veterinary Medicine and the Head of Department. The Director of Teaching also chairs the Teaching Strategy Committee, which is responsible for clinical education strategy within the Department, and sits on the VEC and Faculty Board of Veterinary Medicine. Changes to the curriculum may be made annually, and are notified to all staff and students in the updated version of the Curriculum Document at the beginning of the Michaelmas Term. Course organisers and individual lecturers may propose changes in individual course content. Further impetus for change may come from the Teaching Strategy Committee itself when it considers student questionnaires and comments from course organisers and from external examiners. To regulate this, and to assist in identifying the need for change, a meeting of all teaching staff (the Teaching Staff Group) is held each term with the Director of Teaching.

Major curriculum changes, and changes to overall educational policy, are considered by the VEC, and changes involving amendment of the examination structure must be submitted to the Faculty Board of Veterinary Medicine, and from there to the University's Education Committee for approval.

Further details of how these committees interact to agree and approve content of the curriculum and to ensure quality of delivery and assessment are given in SER 2. A summary of the interactions is given in the flow diagram below:



**\*Preclinical departments contributing to veterinary curriculum are:**

- Biochemistry (MIMS)
- Pathology (BOD)
- Pharmacology (MODA)
- Physiology, Development & Neuroscience (CVB, HOM, NAB, VAP, VRB)

## **Preclinical Pedagogical Philosophy**

There is a strong commitment to providing veterinary students with a firm basis of scientific knowledge for their clinical studies, and to building on this with the development of communication skills, and other skills and attributes required for good veterinary practice.

In Years 1-3 (MVST / Second VetMB in years 1 & 2, and usually a Natural Sciences Tripos Part II subject in year 3), a variety of teaching methods is employed, including conventional lecture and practical formats, computer packages, problem-based learning, and small group teaching (typically a seminar followed by a reporting session). Year 3 places particular emphasis on self-directed learning through research projects and/or dissertations.

Throughout the first two years, the College supervision arrangement operates as a small group teaching system, which is highly effective in reinforcing and complementing the formal lecture and practical teaching provided by the Departments. Students learn to participate in supervisions and to develop their verbal skills (through discussion), written skills (by writing essays) and analytical skills (calculations, data handling and interpretation) relevant to practical-based work.

Other examples of the use of non-didactic teaching methods include the Molecules in Medical Sciences (MIMS) course in Year 1 and the Biology of Disease (BoD) course in Year 2, which have problem based learning in the practical courses, in which students are split into teams and given aspects of a problem to investigate.

During the course of the 3<sup>rd</sup> year, students will carry out either a laboratory-based research project or a research dissertation, both of which require them to develop practical skills, organisational skills, and independent study skills, together with critical skills such as journal review, data analysis and presentation.

There is formal self-directed learning via computer-assisted learning (CAL) packages for several courses including Veterinary Anatomy and Physiology, Principles of Animal Management and Preparing for the Veterinary Profession courses.

An online Maths for Veterinary Students course is available to support those students who did not sit Maths at A2 level.

The PAM and PfVP courses run through Years 1 and 2, and are the beginning of the vocational teaching and learning which continues throughout the course. PfVP addresses specific vocational issues for veterinary students, including communication in a veterinary professional context. Communication skills training continues in the clinical course in rotations in Years 4, 5 and 6.

The acquisition of communication skills has always been a strength of the veterinary course at Cambridge. The small group College supervision system that is dominant in Years 1 and 2 requires students to develop the skills of oral and written communication under close supervision.

Course handbooks and lecture handouts are distributed for all courses during the first three years. In the 3<sup>rd</sup> year, students are expected to study independently and to

read material from source literature, including research articles from primary journals, as part of their selected area of specialist study.

Course handbooks and lecture slides/handouts are also available to students on the University's Virtual Learning Environment (VLE), Moodle, together with CAL packages and other learning materials (access is individually password protected).

The Faculty of Biology also provides a Veterinary Handbook for veterinary students; this is also available on Moodle, linked from individual course sites.

A "Landscape Document" giving an overview of the Part I and Part II courses undertaken by veterinary students and how material on these courses inter-relates ("signposting") was generated by students in summer 2013 through funding from School of Biology and CARET, includes the lecture slides and handouts, and is available to veterinary students in years 1-6. Students are reminded of this resource at the induction sessions to 4<sup>th</sup> and 6<sup>th</sup> year; it is also available through the Faculty of Biology ([www.biology.cam.ac.uk/undergrads/mvst/raven/student-perspective/view](http://www.biology.cam.ac.uk/undergrads/mvst/raven/student-perspective/view)).

## **Clinical Pedagogical Philosophy**

In the clinical course students learn through a range of activities including lectures, practical laboratory work, assignments, practical and clinical work in rotations, small-group teaching, seminars, experiential learning, electives and EMS, supplemented by self-learning and CAL. The Department is committed to high quality small group teaching as the basis and particular attribute of the clinical course.

Lectures are extensively illustrated and supported by handouts indicating aims and objectives, core material and material for further study.

PowerPoint presentation is now the accepted way of delivering formal lectures, with illustrative material forming an integral part of the presentation.

There is a Departmental policy of making all didactic and illustrative material available to students on CamTools (this will move to Moodle in summer 2015) for further study and revision.

Laboratory practicals have a variety of formats including demonstrations, problem solving exercises and report writing, and involve both paraclinical and clinical teaching staff where appropriate. An interactive teaching approach is encouraged. Written information for the practicals is provided to students. Subject seminars and directed-learning sessions complement the practical teaching in some courses in 4<sup>th</sup> and 5<sup>th</sup> year and are an integral aspect of the lecture-free final year.

Communication skills are taught in a specific veterinary context in the clinical course where presentations to peer groups of varying size is common, and communication with owners and other veterinary professionals is an integral part of the final year clinical work which builds on the experience gained at the local RSPCA clinic in the 4<sup>th</sup> and 5<sup>th</sup> year.

The 4<sup>th</sup> year rotations provide a wide variety of learning experiences: observation of veterinary practice, animal handling, basic clinical examination, communication skills,

laboratory animal medicine, radiography and necropsy work, and work at the local RSPCA clinic. Fourth year students are responsible for lambing the University's flock.

In the 5<sup>th</sup> year, experience is expanded to include further work at the RSPCA clinic, practical gynaecology and obstetrics, clinical pathology and laboratory animal work. There are classes on clinical examination, cattle foot-care, rectal examination, pregnancy diagnosis of cattle and horses, neurology, equine surgery, radiography, and further communication skills.

Lectures and seminars on practice management and business skills are delivered to 5<sup>th</sup> year students by a veterinary-qualified Partner of Bridges Ventures LLP.

The 6<sup>th</sup> year rotations involve practical clinical work in a number of disciplines in the QVSH and in the equine and farm animal first opinion practice; students take personal responsibility for individual cases. These rotations provide an opportunity for students to discuss issues with members of staff in small groups and individually. Continuous assessment of students occurs during all final year rotations. Practical clinical skills and a number of generic skills are assessed in a formalised way within a working context which is more efficient, objective and fairer than during final end of year exams. Marks generated during continuous assessment contribute to the marks for the Final Vet MB examination Part III. Any student failing continuous assessment of a rotation is required to retake and pass the rotation assessment before proceeding to the Final Vet MB examination Part III.

EMS exposes students to the practical, ethical, financial, managerial and inter-personal aspects of professional practice. Students, in consultation with their VSCS, are encouraged to study in a variety of practices, and to spend up to six weeks in EMS placements of their choosing (e.g. Animal and Plant Health Agency, pharmaceutical companies), in addition to clinical practice. There are stipulated durations of EMS placements to ensure appropriate levels of EMS experience in particular animal species. These stipulations are indicated in the Guide to Extra-Mural Studies provided to all students in hard copy and also available online through the Current Student Information pages on the Department's intranet site. Many students spend time abroad, or in research or other specialist institutions. In all these environments, teaching is by extra-mural teachers engaged in their usual professional activities.

### **General Learning Objectives for the curriculum**

Each component course of the curriculum, including preclinical courses run by different Departments and those run by the Department of Veterinary Medicine have learning objectives specific to each course. All Departments have a strong commitment to delivering scientific education in biomedical and veterinary sciences at the highest level, together with equipping students with the generic, transferable, practical and professional skills required of modern veterinary graduates. The overarching learning objectives and educational aims of the VetMB course are detailed in SER 2, Chapter 1.

## **Partner Institutions**

The RSPCA Clinic is used for all clinical students in the 4<sup>th</sup> and 5<sup>th</sup> Year Rotations and for 6<sup>th</sup> Year small animal medicine rotation on Saturdays. Students visit the Blue Cross adoption centre in Cambridge as part of their 6<sup>th</sup> Year small animal medicine rotation. These partners provide cases for students to develop and practise their dentistry and neutering surgical skills.

The College of West Anglia, Milton, provides the practical component of the 1<sup>st</sup> Year Principles of Animal Management course. It also hosts a 4<sup>th</sup> Year exotics rotation for all students, and provides access to their pig herd for 5<sup>th</sup> Year clinical methods teaching.

In the 5<sup>th</sup> Year, equine studies rotation students visit World Horse Welfare for further clinical experience.

Premises visited in connection with the Food Hygiene course are detailed in SER 1 Chapter 4.

### 5.1.2 The teaching environment

#### **Academic Staff Development Facilities**

The University's Staff Development Unit organises a comprehensive programme of courses for academic staff on aspects of teaching, research and administration that are common to several disciplines. Teaching staff are encouraged to attend sessions provided by the University's Academic Staff Development programme, some of which are designed to meet the specific needs of newly appointed staff, whilst others aim to assist current staff to develop their full potential in teaching. They include courses in teaching, assessment and management skills, and are aimed at helping new staff to build up their expertise and teaching portfolio.

Each Department contributing to the MVST / Second VetMB programme, and the Department, appoints a University Staff Development Liaison Officer as a local source of information on the programmes.

Within the Department of Veterinary Medicine, annual Staff Training Days have been implemented since 2010 and consider topics of particular/current interest. Further details of these are provided in SER 2, Chapter 4.

#### **Reward of teaching excellence**

The University has a Senior Academic Promotion scheme. Promotion to University Senior Lecturer level requires an excellence in teaching as well as in research and administration. Recent changes to the promotion scheme added far greater emphasis to teaching contribution. Supporting evidence in this scheme includes peer review, student questionnaires and examples of teaching innovation and good practice. Promotion to University Reader or University Professor also requires excellence in teaching although there is greater overall emphasis on research for progression to these offices. The promotion schemes, together with the staff

development programme, constitute a substantial incentive for individuals to strive for excellence.

Further details are provided in SER2, Chapter 3.

## **Appraisal**

Teaching staff (at Lecturer or Senior Lecturer level) are appraised under a University programme every two years. Further details can be found at: <http://www.admin.cam.ac.uk/offices/hr/policy/appraisal/>

## **Measures taken to improve teaching quality in the preclinical course**

The course has a clear management structure, and mechanisms for obtaining and acting on student feedback. There is provision for reviewing course content, not just at the level of the individual courses by the management committees, but also in relation to the other courses that make up the first two years of veterinary education, through the operations of the MVST I Committee and the Veterinary Education Committee.

Review includes:

- student feedback from student representatives on Departmental Teaching Committees and MVST I Committee (all meet termly) and through annual questionnaires;
- student feedback directly from student liaison groups;
- scrutiny of internal and external examiners reports;
- self-assessment from lecturers and course organisers of the impact of their teaching, including discussions at Departmental Teaching Committees;
- feedback from College Directors of Studies and Supervisors;
- monitoring the effectiveness of the teaching through analysis of the results of student examinations and ongoing assessments;
- peer review of newly appointed lecturers.

All feedback is considered by course management groups and the MVST I Committee, and used to inform the process of reviewing and refining the individual courses and the curriculum in general.

## **Measures taken to improve teaching quality in the clinical course**

Review includes several aspects:

The responsibility of Course Organisers includes peer review of lectures, where each member of staff's lecturing is observed by a colleague, is conducted at least once every two years, and feedback is provided. A report of each assessment is passed to the Director of Teaching for action if necessary. The Director of Teaching may discuss with the lecturer concerned the ways in which performance may be

enhanced, e.g. by attending Personal and Professional Development courses provided by the University on teaching technique.

Student feedback on individual lecturers is not discussed in meetings of the Student Consultation Committee; student representatives are encouraged to forward comments to the Director of Teaching who then discusses the feedback with individual lecturers (and Course Organiser and/or Head of Department if appropriate) as required.

Student feedback on 6<sup>th</sup> year rotations is provided through a reflective form and comments from students at the end of each rotation, in addition to rotation questionnaires.

Student questionnaires are approved by the Teaching Strategy Committee and circulated electronically by the Academic Support Officer, in order to gather information on the performance of each lecturer and the overall impact of each course. Completed questionnaires are returned at the end of each course to the Academic Support Officer, who forwards copies to the course organiser and to the Director of Teaching (who may raise with the Teaching Strategy Committee or Teaching Staff Meeting any items requiring action). The results of the questionnaires and the action taken are transmitted to students through their representatives on the Student Consultative Committee.

Lecturers are responsible for enhancement of the content of individual lectures, both in response to feedback and in response to advances in the field of knowledge. Lecturers are required to notify the course organiser of enhancements to their course, for inclusion in the Curriculum Document. Course organisers and individual lecturers may propose changes in individual course content. To regulate this and assist in identifying the need for change, a meeting of the Teaching Staff Meeting is held each term.

The Teaching Strategy Committee and the Teaching Staff Group consider items from student questionnaires and course organisers' reports in order to identify areas where changes in course content are needed within the context of the whole curriculum. Course organisers implement decisions from the Teaching Strategy Committee and Teaching Staff Meeting and discuss any problems with the Director of Teaching at their termly meetings.

Where External Examiners' comments relate to areas of the curriculum in which students have not performed well, or where aspects of particular courses are deemed inadequate, these are also considered by course organisers, the Director of Teaching and the Teaching Strategy Committee.

From 2010, annual Training Days were instituted to cover matters of teaching and assessment. Attendance is monitored and summaries of each training session are provided via CamTools. Staff are encouraged to attend other training courses within the University; there is no specific veterinary post-graduate qualification in teaching within the University of Cambridge at the present time.

Further information is given in SER2, Chapter 4.

### 5.1.3 The examination system

The University's overall assessment policy is determined by the Education Committee of the General Board, and local arrangements are the responsibility of the Faculty Boards. The University's policy is that the systems of assessment used should be appropriate to the subject material, should test not only factual knowledge but also understanding, should be comprehensive and transparent, and should be capable of being monitored for effectiveness.

#### **Preclinical examinations (MVST / Second VetMB)**

Each examination is set and marked by a body of examiners and the results are scrutinised by an External Examiner. Examinations for 2<sup>nd</sup> VetMB only are delivered at the end of Lent Term in 1<sup>st</sup> and 2<sup>nd</sup> year. (These examinations are ISBM, PAM and PfVP.) The second half of the Easter Term is set aside for examinations that contribute to both MVST and 2<sup>nd</sup> VetMB in the first two years.

During their first three years, students are exposed to a variety of assessment protocols. The first two years of the course have substantial examination components, which involve the use of multiple-choice questions (MCQs), and short-answer questions. Data-handling and interpretive questions are used for practical examinations. Workbooks and dissertations are also used in the assessment of the 2<sup>nd</sup> Vet MB qualification. These measures also determine about 50 % of a student's Tripos mark, the remainder being made up by essay-type questions, which are designed to test students' ability to integrate their knowledge and to synthesise concepts and arguments.

In the 3<sup>rd</sup> year, students doing a single subject Part II will generally carry out a literature project or a laboratory project which together may account for 20-30 % of their total mark, depending on the subject. Students doing the Natural Sciences Tripos (BBS) Part II are required to produce a dissertation/laboratory project report on an approved subject.

Assessment criteria are published on the Faculty Board of Biology website. Grade boundaries are established by the Senior Examiners (essentially the Chairs of Examination Boards for each subject), following University guidelines, using linear scaling and Hofstee methods. External Examiners validate the results of examinations throughout the first three years.

All students are permitted two attempts at the examination for each 2<sup>nd</sup> Vet MB subject under the Regulations. If, under exceptional circumstances, a student fails at the second attempt, a case may be made to the Faculty Board of Veterinary Medicine, which has the discretion to allow a further attempt at the examination. The Regulations specify that, except with special permission granted in exceptional circumstances, the second attempt at any 2<sup>nd</sup> Vet MB examination must be not later than 5 months after the first attempt. Students must obtain a pass in all the 2<sup>nd</sup> Vet MB subjects and possess an Honours degree before beginning clinical study (4<sup>th</sup> year).

Students whose academic progress is unsatisfactory (e.g. requests for an exceptional third attempt at a 2<sup>nd</sup> VetMB examination) are considered by the Medical and Veterinary Student Progress Panel (MVSPP), with explanatory information from the student's College and supporting medical evidence where appropriate. The purpose of the MVSPP is to act as a source of advice for Colleges and Faculty Boards and to ensure even-handedness of consideration of individual student cases across Colleges, years and medical vs veterinary students. Details of the MVSPP are described at [www.admin.cam.ac.uk/univ/so/2014/chapter02-section28.html](http://www.admin.cam.ac.uk/univ/so/2014/chapter02-section28.html) (also see SER2, Chapter 2).

### **Clinical examinations (Final Vet MB)**

The examination system is seen as an integrated programme to ensure steady work patterns and regular opportunities for students to assess their progress. The Final Vet MB Part II and Part III examinations assess total knowledge acquisition and understanding at those particular stages of the course;

The Final Veterinary Examination Part I consists of a series of 13 course examinations, consisting of short MCQ papers (some of which are practical-based) following the end of each course. They are spread throughout Years 4 and 5, and constitute the Final Vet MB Part I. The examined courses are systems- or discipline-based. Their aim is to ensure assimilation of knowledge in an on-going manner in support of the systems-based courses and practical, case-based scenarios. The number of individual modular examinations in the final VetMB Examination Part I is currently being modified, with improved blueprinting against the curriculum and by combining small exams into a single assessment. Students must have passed all the components of the Part I examinations to allow them to sit the Part II examination. Students are allowed three attempts at each component of the Part I examination after which they must apply to the Faculty Board for any further attempt.

The Final Vet MB Examination Part II: This examination is taken at the end of the third term of 5<sup>th</sup> year. It consists of 2 written papers, each of 2 hours duration with compulsory essay and short-answer questions, and a practical paper of 2 hours of short-answer questions based on specific specimens, histopathology slides, clinical pathology data or radiographs (for examination details see information in base room). The aim of this examination is to allow students to demonstrate in-depth and integrated knowledge. This is seen as a 'gateway' examination to ensure that students are ready and prepared to enter the 6<sup>th</sup> year. Students are allowed two attempts at each component of the Part II examination after which they must apply to the Faculty Board for any further attempt.

The Final Vet MB Examination Part III is taken at the beginning of the third term of 6<sup>th</sup> year. Continuous assessment during the 6<sup>th</sup> year rotations contributes 1/3 of the overall Part III examination mark. The 'black book', which includes several practical skills, must be completed and signed by appropriate staff before a student can sit the Part III exams. The written examination consists of 3 written examinations of 3 hours each (small animal medicine, equine medicine, farm animal medicine) and one 2 hour examination (Veterinary Public Health). Viva voce (oral) examinations are held in all 4 areas, each student receiving two 20-minute vivas for small animal, equine and farm animal areas and one 20-minute viva for VPH. Two examiners are present in each and External Examiners may observe or participate in the viva voce

examinations, allowing QA through personal observation in addition to their analysis of assessment of written work. There is a pass / fail viva system for borderline pass/fail candidates and a viva for borderline merit candidates. Candidates must pass all four components; there is no virement of marks between the four examined subjects. A pass in the 6<sup>th</sup> year elective is a prerequisite for the award of the VetMB degree. Subsequent assessment of the elective component is by submission of a 3,000 word dissertation of research projects or 2,000 words for case-based projects (these dissertations are blind double marked; marking/grading criteria are published to staff and students), a 15 minute oral presentation (marked by two staff members, with published descriptors and marking criteria), and presentation of a certificate of diligent attendance.

### **Examination methods**

Several assessment formats are used throughout the clinical course, including written papers, multiple choice questions, short answer questions, practical examinations, oral examinations, continuous clinical assessment (including demonstration of a wide range of practical and interpretive skills), submitted written work, and oral presentations related to 4<sup>th</sup> Year assignments and 6<sup>th</sup> Year electives.

### **Examination policy and procedures**

The Faculty Board of Veterinary Medicine determines examination policy for the clinical course. Examination procedures are laid out in *Statutes and Ordinances*, and modified by local Form and Conduct notices providing students with detailed information regarding the format of assessments. These Form and Conduct Notices must be published in The Reporter at least one full academic term in advance. External Examiners from other Veterinary Schools or other elements of the profession have access to information on the course content, scrutinise all examinations before the students sit the relevant exam and review the results of each exam.

### **Attempts at the examinations**

Three attempts at a Final Vet MB Part I and Part III examination and two attempts at the Part II examination are normally allowed automatically. Resit examinations are allowed for individual components of the Part I or Part III examinations; the Part II examination must be re-sat *in toto*. In special circumstances, the Faculty Board of Veterinary Medicine has the discretion to allow further attempts.

### **Eligibility to sit the examinations**

In the clinical course a student must pass all components of the Final Vet MB Part I before entry to Final Vet MB Part II. The Final Vet MB Part II must be passed before entry to the 6<sup>th</sup> year of the course and Final Vet MB Part III. The minimum EMS requirements must have been satisfied before students can sit the Part III examination. The clinical course must normally be completed within eight years (92 months) of matriculation.

#### 5.1.4 Evaluation of teaching and learning

##### **Pre-clinical Quality Management (see also SER2, Chapter 2)**

Arrangements for soliciting feedback and course review are partly Departmental and partly Institutional. Individual courses solicit feedback from the students, but there is an overall review process, which is the responsibility of bodies such as the MVST I Committee and the Veterinary Education Committee (VEC).

Student feedback is obtained through questionnaires and directly from student representatives on course management committees. Feedback is also obtained from students indirectly through College supervisors and Directors of Studies. Feedback is also obtained from College Directors of Studies and College Supervisors directly.

Lecturers and course organisers provide a self-assessment of the impact of their teaching.

The Veterinary Clinical Anatomist or the Department of Veterinary Medicine's Director of Teaching are members of the Teaching Committees of most of the pre-clinical courses and both are members of the MVST I Committee and VEC, and can act to provide advice on relevant areas of teaching to veterinary students in individual subjects and also act as a communication link to staff teaching the clinical courses.

Results of the feedback are used in the review and revision of course components. The reports are considered by course management groups, the MVST I Committee and the Veterinary Education Committee, and used to inform the process of reviewing and refining the individual courses and the curriculum in general.

##### **Clinical Quality Management**

Quality management of the clinical curriculum is the responsibility of the Director of Teaching, on behalf of the Faculty Board of Veterinary Medicine and the Head of Department. The Department submits an annual Quality Assurance Statement to the University and forms part of the overall basis for the quality assurance procedures within the Department.

The Student Consultative Committee meets twice each term, and its membership consists of representatives from each student year and members of teaching staff. The meeting is chaired by the Deputy Head of Department (Dean of the Veterinary School). There is a student representative for each of 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> year and a further two students, elected by their fellow students as members of the Faculty Board and Veterinary Education Committee, also attend. Open meetings for each year's students from the clinical course are held periodically by the Director of Teaching, who also receives comments on the course from students at any time. Students who wish to remain anonymous may use a Student Concern Policy. The Director of Teaching may take any issues raised by students to the Teaching Strategy Committee or the Teaching Staff Meeting for further discussion or implementation.

Student questionnaires are approved by the Teaching Strategy Committee and circulated electronically by the Academic Support Officer in order to gather

information on the performance of each lecturer and the overall impact of each course. Completed questionnaires are returned at the end of each course to the Academic Support Officer, who forwards copies to the course organiser and to the Director of Teaching (who raises with the Teaching Group or Teaching Strategy Committee those cases requiring action). The results of the questionnaires and the action taken are transmitted to students through their representatives on the Student Consultative Committee.

Each course in the curriculum is managed by a course organiser. The structure of courses is described in the Curriculum Document, which is distributed to staff and available for students on CamTools. The course organiser makes an assessment of the course on its completion each year, taking into account the student questionnaire responses, examination results and enhancements notified by individual lecturers, and is responsible for the annual review of the entry in the Curriculum Document to ensure that it continues to describe the aims, objectives and structure of the course accurately. The roles of course organisers are listed in the Teaching Guide which is updated annually.

Examiners and External Examiners are nominated by the Faculty Board and appointed by the General Board. The Tutorial Office provides a briefing pack to the External Examiner on the teaching and assessment performed in the relevant part of the course. External Examiners are required to submit a report to the Vice-Chancellor. A response to the External Examiners' reports is compiled by the Deputy Director of Teaching, in liaison with Chairs of Examination Boards. The Teaching Strategy Committee considers the responses before forwarding them to the Strategy and Executive Committee that then reviews these responses and addresses each point in these reports, in case there are organisational or resource implications. A report is then made to the Faculty Board of Veterinary Medicine, which must satisfy the General Board's Education Committee that any points raised have been or will be addressed. Matters concerning quality assurance, teaching, and course content are passed to the Director of Teaching for action.

Student reports on EMS placements are seen by the EMS Coordinator, the Director of Teaching, and VSCSs. The EMS Coordinator or Director of Teaching contacts the placement provider if necessary and may review and discuss the feedback with the individual student, to identify any remedial measures that may be required.

#### 5.1.5 Student welfare

##### **Student welfare provision throughout the University and College system**

The University, preclinical Departments, Department of Veterinary Medicine and the Colleges offer a wide range of resources to support and guide students. This pastoral network may be accessed at different points depending on the nature of the student's requirements. All veterinary students, whether preclinical or clinical, belong to a College and have a Director of Studies and a Tutor within their College, available for academic and pastoral support respectively, plus other support such as the College Nurse and their Veterinary School Clinical Supervisor (VSCS; see below). The overall responsibility for student welfare within a College lies with the Senior Tutor.

Several members of staff in the Veterinary School act as College Directors of Studies and/or College Tutors. All students may approach their individual College Tutor for advice on financial support, which may be available from a College's own resources or a variety of other funds. Colleges also provide and co-ordinate housing of students and, although a proportion of students live in other accommodation, the majority are housed in their College or in College-owned accommodation at least during the first three years. The Colleges provide catering services and communal kitchens, which students can use to self-cater.

The University and Colleges offer a wide range of opportunities for cultural and social interaction and recreation, through College and University societies, and the intermixing of students in all disciplines. Both the University and the Colleges provide sports and cultural facilities, and the diverse and vibrant extra-curricular activities of the University are organised largely through College and University societies.

All students are members of College Common Rooms (Junior Common Room, Middle Common Room depending on College and year of study) that also provide a range of support, social and other facilities, organised by the students themselves.

Veterinary students are entitled to use the wide variety of specialist support services provided by the University's central authorities, such as the Accommodation Service, Occupational Health Service and Expedition Medical Support Service, Disability Resource Centre, Language Laboratory, University Information Services, University Library, Counselling Service, University Careers Service, and College Student Unions. Cambridge University Students Union and the Graduate Union offer a variety of services, and students in the clinical years are eligible for membership of the University Centre.

All the provision outlined above is available at all times, if required.

However, since clinical veterinary students work mainly within the Department during the clinical course, support here is of prime importance. The Department delivers introductory lectures to students on the subject of creating a personal support structure as a preparation for their entry to veterinary practice. While pastoral support is primarily a role of College, the Department has a nominated Pastoral Support Officer who can also act as a conduit for advice and support, together with a student's VSCS (see below). Notwithstanding all the University and College support systems, some students choose to access support via their VSCS or the Department's Pastoral Support Officer.

### **Preclinical student welfare**

Support is based in Departments, and on the College supervision and tutorial system. This gives a high degree of close contact with individual students, and is geared to provide formative assessment of progress and to detect at an early stage those students who are having difficulties either academically or in their personal life, and to provide help and guidance for such students to overcome their difficulties. Colleges can arrange extra tuition targeted to meet the specific needs of the individual student, and have access to University support services, such as the Student Counselling Service.

Academic feedback is given through the supervision system by supervisors and Directors of Studies. Supervisors submit electronic reports through the Cambridge Colleges' On-line Reporting System (CamCORS), detailing students' attitude and progress, which the Director of Studies will discuss in a formal meeting with each student at the end of each term. Directors of Studies organize formative exams in the main subject areas at regular intervals and review the outcomes of these with students. Students in their preclinical years also meet their VSCS at least twice a year; VSCSs record these meetings and students' EMS progress via the CamCORS system. Also, students usually meet with their Director of Studies and College Tutor twice a term, or more frequently if required.

### **Clinical student welfare within the Department**

#### **Veterinary School Clinical Supervisor (VSCS)**

Each clinical student, on entry into the Department, is assigned a VSCS, who is responsible for guiding and monitoring their progress. This VSCS is usually the same staff member who has provided advice and overview of the student's pre-clinical EMS. The VSCS is a MRCVS and a member of staff in the Department. Each student meets with their VSCS each term in a timetabled slot, and their 'black book' is signed to confirm that the meeting has taken place. The Academic Support Officer circulates examination marks to VSCSs, and sends students individually a copy of their own marks. These are accompanied by an instruction to see their VSCS if they have failed an examination, and advice to see their VSCS if their performance was borderline. The VSCS may either give advice, decide that no further action is required, or refer the student to the Department's Pastoral Support Officer, to his or her College Director of Studies or College Tutor, or to another source of support such as the University's Counselling Service, as appropriate. The VSCS is also responsible for advising on EMS, for instance on the requirements of the EMS regulations, suitable placements, and placements abroad. EMS assessments are forwarded to the student's VSCS for feedback to the student should any remedial action be required. VSCSs also provide an electronic report to Colleges (through CamCORS) on each student's progress with EMS, so that support mechanisms in Colleges are kept fully informed.

Other regular meetings are held on an annual or biannual basis to aid communication between the Department and Colleges. These include:

- meeting of all VSCSs, convened by the EMS Co-ordinator
- meetings of Directors of Study of preclinical studies
- meeting held by Clinical Dean in the School of Clinical Medicine and Director of Teaching in Department of Veterinary Medicine to which all College Tutors and Directors of Study are invited

Matters of concern arising from those meetings are then communicated to Department, Faculty or School committees, as appropriate.

The EMS Co-ordinator has several functions including acting as the senior VSCS and providing, where necessary, liaison between VSCSs, and chairing an annual meeting of VSCSs. S/he deals with student difficulties, academic or pastoral, which

are referred by a VSCSs. Students may decide to seek advice from him/her directly rather than from their VSCS, and the EMS Co-ordinator is available to provide support for clinical students making appeals to the Faculty Board. S/he provides advice to students on an individual basis about EMS in the circumstances above and routinely sees all EMS assessment reports in case they raise general or organisational issues, supported in this role by the Academic Support Officer and the Senior Secretary (Academic Support).

The Academic Support Officer is often the first port of call for students for information, though handling all day-to-day administration concerning the clinical veterinary course. The Officer provides administrative and secretarial support for examiners and the EMS Co-ordinator, administers travel and maintenance grants for EMS, maintains the database of EMS practices, and assists the Director of Teaching in preparing the timetable. The Officer also sends examination marks to Directors of Study, alerting them to failure or borderline performance, and alerts VSCSs to examination failures or borderline pass marks.

Students wishing to discuss personal circumstances in a confidential and supportive manner may also approach the Department's Pastoral Support Officer. The Pastoral Support Officer may then, with the student's agreement, liaise with other staff, the student's College or other University or external support services to help the student resolve or manage the particular issues affecting their mental health/well-being and academic performance.

Students whose academic progress or behaviour patterns are of particular concern may be referred to the University's Medical and Veterinary Student Progress Panel. The aim of this panel is to review such students and advise on additional support or considerations that those students may require. The Director of Teaching and another veterinary-qualified academic member of the Department represent the Department on that Panel, whose members also include the Clinical Dean and Director of Medical Education, the Director of the Graduate Medical Course, the Associate Dean for Medical Student Welfare, the Director of Education in the Faculty of Biology, representatives from the Senior Tutors' Committee, and administrative staff of the Faculty Board of Biology, Clinical Medicine and Veterinary Medicine. This joint committee ensures that matters of progress and support for medical and veterinary students are considered on a similar basis.

### **Other Available Assistance**

The Departmental librarian and support staff concerned with teaching often provide first-line advice and help to students on matters within their competence.

The Department has three active veterinary student societies, the Cambridge University Veterinary Society, the Cambridge University Veterinary Zoological Society and the Cambridge Farm Animal Veterinary Society, which provide supplementary learning experiences and social support.

Catering facilities are available within the Department through vending machines and a mobile catering van, near the Department at the West Café, in the University Computer Laboratory and through further catering vans, and a full range of catering facilities is also available in the adjacent Department of Physics. A new University Sports Centre on the West Cambridge site opened in 2014 and includes a further

catering facility. Nevertheless, catering provision on the West Cambridge site needs to be at a price students can afford on a daily basis. Students have access to kettles, fridges and microwave ovens in their Student Resources Centre.

## **Careers guidance**

Students are encouraged to attend an annual three-day seminar of the Society of Practising Veterinary Surgeons. Several students have attended the Leadership Programme at Cornell University. Advertisements for research training opportunities, junior clinical training posts in Veterinary Schools, and assistantships in practice within the UK and abroad, are circulated to students via email and are posted on the website. Many first jobs are identified through advertisements in the Veterinary Record. Students may seek specific advice, usually on an initial entry into practice, from their VSCS and advice on specialised interests and opportunities from the academic staff member most closely allied to that area. Many clinical veterinary students thus have little need of advice from the University Careers Service, but this is available to provide information for any career path. The University Careers Service also provides advice to students on preparing their Curriculum Vitae and on interview techniques. Students will also be able to attend the joint careers fair at the Royal Veterinary College (2015).

## **Overview**

The support systems available to clinical veterinary students overlap in many ways. Students have recourse to several different sources for academic, pastoral and general advice, and this ensures that it is readily available when needed, and provided by individuals who are best placed to support the individual student.

## 5.2 Comments

### **Quality of the teaching programme**

We believe that the teaching programme is of an excellent standard, and well suited to the needs of our graduates in their future employment. The Department reviews each course on a regular basis and has restructured courses and examinations in recent years. The University conducts internal reviews of all the Departmental teaching every seven years with members of the review panel drawn from across the University, Cambridge University Student Union and an external member (see SER2, Chapter 5). The recent University Learning and Teaching Review of the Department (2013) 'was impressed with the standards of all the courses managed by the Department' and that "the (science-based) curriculum design was a model for other veterinary schools". It concluded that 'the standards of the courses are all entirely satisfactory. The quality of the teaching is at the highest level: the teaching environment is extremely positive and endorsed by staff and students'.

Notwithstanding these reports on the quality of the course, the Department made a strategic appointment in October 2014 of a specialist in curriculum design and innovation to drive further educational initiatives.

The Teaching Strategy Committee actively pursues a policy of development and improvement of the curriculum and teaching methods. We believe this ensures that

we remain responsive to the needs of the profession, whilst maintaining a balanced and forward-looking teaching programme.

There are robust mechanisms in place for monitoring student and staff feedback and for acting on this. An advantage of the small size of the Department is that members of staff are in regular close contact with students, so informal feedback is readily available in addition to the formal mechanisms.

The University Central Authorities issue a guide to quality assurance and enhancement for Faculties and Departments. The Department has its own Learning and Teaching Quality Update (Appendix 1), which is reviewed and updated annually and approved by the General Board's Education Committee.

The last QAA subject review specific to the Department of Veterinary Medicine was in 1999 and recognised the quality culture within the Department and the robust and effective mechanisms in place for evaluation of its teaching. The QAA Institutional Audit of 2014 did not raise any significant issue directly concerning the Department only but gave recommendations for the University as a whole, which are being implemented. The University Learning and Teaching Review (2013), which drew attention in its report to "The quality of teaching is at the highest level, the teaching environment is extremely positive and is endorsed by staff and students", "the very strong sense of community which was evident among both clinical and graduate students, and the seriousness with which teaching was so evidently taken throughout the Department. Students felt supported by the Department as well as the colleges" and that "...the 'Cambridge model' for veterinary education clearly worked very well and provided a valuable contribution to the landscape of veterinary education in the UK. In addition, it is clearly an education valued by the students". The Department remains committed to the provision of an education of the highest standard.

### **External Examiners**

External Examiners provide valuable quality control and moderation of individual courses and the teaching programme as a whole. External Examiners are provided with draft examination papers for comment; their suggested amendments to examination papers are normally included in the final paper and they are sent a reply indicating how their comments have been considered. External Examiners also check the standards and consistency of marking of short answer and essay papers. After the examination, the External Examiner provides a report on both the content and process of the examination, and the comparability of standards with other UK veterinary schools. The External Examiners' reports are considered in detail by the Executive Committee and by the Faculty Board, and comments and action points from the Department are then sent to the University's Education Committee. The action points are passed to the Director of Teaching for implementation.

### **Participation of students in design and monitoring of courses**

Student input into the design, development and monitoring of courses is welcome. The formal vehicle for expression of student views is the Student Consultative Committee, which also feeds back proposals for consultation and decision by the other Departmental committees. Students play an active part in the monitoring and

development of the course. Their ideas are always fully considered and acted upon where appropriate and feasible. Our external lecturers, several of whom are veterinary practitioners, also feedback on our curriculum and their input is considered by the Director of Teaching, course organisers and the Teaching Strategy Committee when planning curriculum development.

### **General comments**

The examination system is efficient, fair and adequate to provide both cumulative and summative assessment, a view broadly endorsed by a succession of External Examiners. Past proposals to modify the examination system resulted in the student view that the system of VetMB Final Examinations Parts I - III served ideally both to stimulate active learning and to provide a fair and accurate assessment of performance. We are, however, responsive to the External Examiners' comments on the system, and each year review their reports and provide a resulting action plan to the General Board's Education Committee. A portfolio-type of assessment, particularly for skills and attributes not easily assessed in MCQ, short-answer or essay formats, is planned for introduction in 2015. We have also created a working group to look at the opportunities for learning and assessment of the professional skills of students throughout the curriculum.

The Department continues to disseminate good practice within the Department, and to encourage staff to make use of other sources of teaching innovation, for example the Learning and Teaching Support Network, and University initiatives such as the setting up of a Database of Ideas and Examples.

Formal training in education is not a compulsory requirement for teaching staff although all are encouraged to attend training modules offered by the University.

The Director of Teaching is currently in discussion with staff at the School of Clinical Medicine and the University's Institute of Continuing Education to develop a course accredited by Higher Education Academy that would be open to all members of staff. This course would focus on relevant educational theory and its application to medical and veterinary education.

### **5.3 Suggestions**

The Department recognises that while its quality assurance (QA) processes for teaching have served well in the past, they should be more formalised. A Teaching Quality Sub-group will be established as part of that process. This is discussed further in SER2. We are concerned about the administrative burden that this may require.

## CHAPTER 6

### FACILITIES AND EQUIPMENT

#### 6.1 Factual information

##### 6.1.1 Premises in general

The physical and human resources that underpin the veterinary course reflect its division into preclinical and clinical education. The preclinical course is delivered in well-equipped lecture theatres and laboratories in the Departments responsible for preclinical teaching; these are located within the University's New Museums, Sidgwick and Downing Sites in the centre of Cambridge.

The resources available to students also reflect the University's collegiate structure: for example, the Colleges provide their own student computing and library facilities. The University provides facilities over and above those provided by Departments and Colleges, such as access to the University Library, which as a copyright library receives a copy of every text published in the UK.

The Department is based on a single site in West Cambridge, around two miles from the preclinical Departments, and comprises 16 separate buildings. All of these buildings have been modified and refurbished over the years to meet the changing educational and scientific needs of the Department. The facilities are constantly upgraded, under a systematic rolling programme of maintenance funded by the University. There are areas of deficiency; refurbishment of Lecture Theatre 1 was identified as a priority in the 2013 Learning and Teaching Review and Lecture Theatre 2 has become very tatty. Other areas are in need of renovation but the majority of facilities are in excellent condition e.g. the Department funded a £2.3M expansion of hospital facilities and the development of a Clinical Skills Centre in 2014.

The main building of the Department incorporates the Queen's Veterinary School Hospital. Research laboratories are housed within the main building and in separate, recently renovated laboratory buildings around the site. Most of the teaching facilities necessary for the education of veterinary students are located on site, with the exception of Cambridge University Farm which is located approximately 3 miles from the Department; the College of West Anglia at Milton, 4 miles from the Department; the RSPCA first opinion clinic and Blue Cross, which are located respectively 4 miles and 3 miles from the Department; and abattoir and food hygiene facilities, which are provided through commercial companies on a number of sites.

The post-mortem facilities provide dedicated large and small animal necropsy rooms with viewing facilities, perfusion room, photography room, sterilisation room and laundry. There is an adjacent pathology cut up room with safety cabinets and specimen storage facilities. The post-mortem suite is accessed through changing and shower facilities, and has a technician's office with separate changing facilities. The building has computer links to the Departmental pathology database, with equipment for digital photograph capture and storage.

Over the last seven years, the Department has continued the programme of extensive building and refurbishment that was initiated in the early 1990s, in order to provide and house specialist research, Hospital and teaching facilities and equipment. Since the 2008 RCVS/EAEVE Visitation, the then ongoing building programme – an extension to the Cancer Therapy Unit to house a new linear accelerator and CT machine (the latter providing a clinical service in partnership with Cambridge Radiology Referrals) and provision of a Category III containment facility for a research group (facilities that have subsequently been extended through purchase of a Beckman FACSARIA) have both been completed. The building and refurbishment programme has continued with: a Student Resources Centre (2011); a Clinical Skills Centre, new clinical pathology laboratories, new consulting rooms, pharmacy, clinical research laboratory (all 2014); refurbishment of the Equine Diagnostic Unit and Hickman Equine Surgery Building (due for completion 2015); further upgrading of a Category 3 research laboratory to include a FACS facility (2013-2015); refurbishment of existing underused buildings to provide further facilities for orthopaedic research (currently being planned and due for completion 2015); refurbishment and consolidation of administration offices to better support the Department's activities (2012-2015) and creation of new meeting/seminar rooms (2014-2015).

In response to the recommendation of the RCVS Visitation in 2008, the University funded a £1.5M project to build a Student Resources Centre. This was completed in 2011 and provides clean and dirty changing areas with individual lockers, toilet and shower facilities on the ground floor, and a social area, kitchen facilities, a quiet work area and further toilet facilities on the first floor.

#### 6.1.2 Premises used for clinics and hospitalisation

The small animal facilities of the QVSH provide custom-built wards for dogs and cats with associated examination, preparation and teaching areas, and a fully equipped intensive care unit for critically ill and injured animals. A new small animal theatre suite provides five theatres, anaesthetic induction bays, a radiology suite and two minor procedures rooms. The recent major refurbishment provided 9 new consulting rooms and a new pharmacy.

The Cancer Therapy Unit, extended in 2008, accommodates a new linear accelerator to provide radiation therapy for small animals and horses.

Diagnostic facilities include recently refurbished X-ray suites and colour-flow Doppler ultrasound machines, small animal MRI, nuclear medicine unit, video endoscopy, thermography and fluoroscopy. A commercial partnership with Cambridge Radiology Referrals, developed in 2011, provides CT facilities within the Department.

The newly built clinical pathology laboratory offers all routine chemistries, haematology, cytology and flow cytometry, and includes a microbiology and parasitology laboratory and a PCR room. In the histology laboratory, facilities are available for routine histology, immunocytochemistry and the production of frozen sections.

The large animal facilities include a state-of-the-art surgical suite and a recently refurbished equine diagnostic unit with three examination halls. A new equine

intensive care unit is currently being provided. The farm animal facilities were upgraded into purpose built accommodation.

Most of the equipment in the small animal clinical facilities is funded directly from income generated from clinical services or otherwise financed by the Veterinary School Trust. However, the relatively small equine operation is unable to generate sufficient income to fund state of the art diagnostic and surgical equipment.

Table 6.2.1 Places available for hospitalisation



### 6.1.3 Premises for animals

The Department owns 11 horses and 3 cows used for teaching purposes, which are housed in a purpose-built facility with adjacent grazing. There are 2 greyhounds maintained for the teaching of topographical anatomy and housed on site. The Cambridge University Farm, incorporating a dairy unit and sheep facilities, with its purpose-built teaching facilities, is 3 miles away, and provides access to normal cattle and a breeding sheep flock.

Teaching of animal husbandry, production animal health and handling of production animals is taught on-site at the Department, on the University Farm, and at the College of West Anglia at Milton.

#### 6.1.4 Premises used for theoretical, practical and supervised teaching

##### Table 6.2 Premises used for clinical work and student training

Number of laboratories for clinical pathology work by students	1
Post-Mortem facilities (one building with two separate areas for teaching)	1
Teaching laboratory	1
Clinical Skills Centre (with 2 rooms for teaching plus consultation room for communications skills)	1
Total number of places in teaching laboratory:	65

##### Table 6.3 Premises for lecturing

Number of rooms for lecturing	2
Number of places per room	
Lecture Theatre 1	116
Lecture Theatre 2	85

##### Table 6.4 Premises for group work

Number of rooms for group work by students*	7
Number of places per room:	
Senior Common Room	23
Seminar Room 2	25
Seminar Room 3	25
Video Conference Room	20
Dr Lee Multimedia Teaching Laboratory	35
Peter Jackson Building seminar room	16
Equine Diagnostic Unit seminar room	16
Hammond Building Seminar Room	15

\* The Small Animal Wing will provide two large rooms that will be used for small group teaching of final year students

#### Table 6.5 Premises for practical work

Number of laboratories for practical work by students	1
Number of places per laboratory:	
Total number of places in laboratories:	65
Post-Mortem facilities and viewing areas	2
Clinical Skills Centre:	1
Number of places per room in Clinical Skills Centre	
Main laboratory	40
Radiography / Haptic Device room	10
Teaching Consultation Room	10

#### 6.1.5 Diagnostic laboratories and clinical support services

A well-equipped clinical pathology laboratory provides a full range of routine haematological and biochemical tests, urine analysis, flow cytometry, parasitological, microbiological and cytological services. This laboratory was relocated in December 2014. The new facilities include a PCR lab and an out-of-hours laboratory for use by Final Year students during their out-of-hours rotation duties.

The histopathology laboratory provides routine histopathology, immunohistochemistry and the production of frozen sections for routine staining and specialised staining.

#### 6.1.6 Slaughterhouse facilities

The Department does not maintain its own slaughterhouse facilities. Students attend the abattoir at Department of Veterinary Science, University of Bristol Veterinary as a compulsory component of their Veterinary Public Health course. Students also visit conveniently located slaughterhouse and processing premises in East Anglia as part of the Veterinary Public Health course.

#### 6.1.7 Foodstuff processing unit

The Department does not maintain a foodstuff processing unit. Students visit such premises, which are co-located to slaughterhouses, as a compulsory component of their Veterinary Public Health course.

### 6.1.8 Waste management

Licensed external waste contractors collect clinical, biological and pharmaceutical waste twice weekly and cadavers requiring individual cremation once weekly. General mixed waste (cadavers not requiring individual cremation, materials from Veterinary Public Health practicals, etc.) are collected by arrangement when necessary.

### 6.1.9 Future changes

The Department's clinical and anatomical pathology services provide diagnostic services for animals held by the University's Biological Services facilities. A proposal for the Department's diagnostic facilities to provide laboratory animal health screening services for the University is currently under discussion.

In the longer term, the Large Animal Unit will be decommissioned and that area of the veterinary school site redeveloped.

## 6.2 Comments

The Department maintains a constant programme of upgrading its clinical facilities, for the benefit of staff, clients, their animals and students.

The Department continues to strive to maintain a rolling refurbishment programme either through its own resource allocation or through the University's Estates Management. In addition, The Cambridge Veterinary School Trust supports refurbishment of clinical and teaching rooms. Nevertheless, several areas of the estate are outdated and in need of replacement.

A number of teaching rooms are in need of refurbishment, particularly the two lecture theatres. Refurbishment of Lecture Theatre 1 was identified as a priority in the Learning and Teaching Review, 2013 and the Department wishes to refurbish Lecture Theatre 2 at the same time. Three seminar rooms in the Teaching Block need refurbishment.

Two new seminar rooms were generated by reorganisation of the Small Animal Wing. The Dr Lee Multimedia Teaching Laboratory is a valuable resource but is underused at present. It does, however, provide a valuable resource that would facilitate our future plans for on-line assessments. Upgrading of the computers currently in that Room is part of the rolling programme of computer replacement in the Department.

The Department will maintain the links with Bristol Veterinary School and the food industry in East Anglia, to maintain and improve VPH teaching

As noted in SER1 Chapter 5, student welfare on the West Cambridge Site is supported both by the Department (provision of a Student Resources Centre; opened 2011; £1.5M) and the University. On the West Cambridge site, there is a limited number of cafes, and mobile catering services are available for limited times of certain days of the week. There is also a sports centre and cashpoint on the West Cambridge site. However, the range and capacity of catering provision on the West

Cambridge site was the subject of a University survey in 2014 and recognised as insufficient. Students in their pre-clinical years have access to many cafés, coffee houses, etc. in central Cambridge but many of these are not affordable by students on a daily basis; a similar situation exists on the West Cambridge site. While some students have ready access to their College facilities in central Cambridge Colleges, not all students are members of these colleges; Downing College has been most supportive in this respect with an open access to its lunchtime dining facilities to students. Nevertheless, student-orientated catering (and other) facilities should be improved both on the West Cambridge site and in the vicinity of the central science campus (Downing Site).

### 6.3 Suggestions

There is an urgent need for the Department's two lecture theatres to be refurbished, along with the three seminar rooms in the teaching block.

Both the CEH and CFAVS have expanded their client base in the past 2 years and it is important to continue to provide a high-quality service to clients while delivering excellent teaching and learning experiences. Teaching and research would benefit from searchable computerised medical records.

In large animal areas, several key items of diagnostic equipment are outdated and need to be replaced by more modern equipment.

## CHAPTER 7

### ANIMALS AND TEACHING MATERIAL OF ANIMAL ORIGIN

#### 7.1 Factual information

##### 7.1.1 Anatomy

The main teaching of anatomy occurs in Years 1 and 2 of the curriculum through the following courses: Veterinary Anatomy and Physiology (VAP; Year 1), Neurobiology and Animal Behaviour (neuroanatomy part of NAB; Year 2), Veterinary Reproductive Biology (anatomy of reproductive tracts; VRB; Year 2) and Comparative Vertebrate Biology (birds, reptiles, amphibia, fish; CVB, Year 2).

Each year, approximately 25 embalmed dogs are acquired; students dissect these during Years 1 and 2. Freshly euthanased animals for immediate autopsy each year include: 1 pig, 4 horses, 10 ruminants, 20 rabbits, 40 domestic fowl, 40 trout. Students dissect most other species in groups of 4; sheep are dissected in groups of 8, and ponies in groups of approximately 18.

In addition, fresh abattoir, market and knacker material is obtained at intervals and includes: fresh tongues, simple stomachs, ruminant stomachs, intestines, hearts, lungs, kidneys, horse distal limbs, horse heads, male and female reproductive organs, thymus, mammary glands, and placentas, according to availability.

Three classes that involve living animals are provided for all students. The species provided include: (1) lizards, snakes and chelonians, (2) various domestic bird species, and (3) rodents, lagomorphs and ferrets.

In addition, students visit the Department of Veterinary Medicine in small groups on four occasions to palpate Department-owned horses, cattle and dogs for surface anatomy classes.

The veterinary anatomy museum is well stocked with a wide range of preserved specimens and labelled bone. Students may hire and take back to their College a bone set (dog bones) at the start of Year 1, and a dog skull at the start of Year 2. Eighteen sets of limb bones are used in two formal classes; similar numbers of dog and horse skulls in skull and teeth classes; vertebrae for demonstrations in a spine class. Various other museum materials including dried specimens and museum pots are used to complement the remaining classes.

Table 7.1 Material used in practical anatomical training

	Dog		Ruminant		Equine		Other	
	2013-2014	2012-2013	2013-2014	2012-2013	2013-2014	2012-2013	2013-2014	2012-2013
Live animals	2	2	2	2	10	9	30*	30*
Cadavers	25	25	10	10	4	4	101	101
Specimens	see notes to table							
Other: bones radiographs	see notes to table							
Computer assisted learning								

## Notes

- See above (7.1.1) regarding use of additional fresh specimens.
- Live animals (others): the numbers of animals available are 5-10 birds per year, 5-10 reptiles per year and 10-20 rodents per year. These pet animals are provided by staff and colleagues. Aspects of surface anatomy may be covered in animal handling sessions in the Principles of Animal Management course and animal handling rotations also.
- The Veterinary Anatomy museum/library has a complete skeleton for every major domestic species, including chickens, plus a mounted half-skeleton. It has a further mounted whole skeleton of dog and goat. The museum/library has at least one fore- and hind-limb for each species (and approx. 20 for dogs) plus more than two disarticulated bone sets for each major species and more than 10 skulls for each species. In addition there are skeletons of fish, frogs, lizards, chelonians and some waterfowl plus many miscellaneous bone specimens, especially skulls, of a wide variety of vertebrates, especially mammals (including rodents, insectivores, cetaceans, pinnipeds and primates). The nearby zoology museum in the Department of Zoology also provides access to an enormous collection of further specimens. Further skeletons and bone specimens are available in the Department of Veterinary Medicine.
- The Veterinary Anatomy museum also houses approximately 100 preserved, encased specimens ("pots"), 100 prosected specimens and 50 ligament preparations. It also maintains a catalogue of over 330 radiographs or MRI plates.

### 7.1.2 Pathology

The Department has a modern, secure post-mortem room with two halls, walk-in cold rooms and freezers, hoist, bandsaws, safety hood and a full range of equipment and instruments. There are also separate rooms for specimen preparation. The post-mortem building also houses the trimming room for histopathology and storage areas for preserved specimens (for use in teaching), together with changing and showering facilities.

The histopathology laboratories – processing room, cutting room and storage areas – are housed in a separate building and are fully equipped with modern equipment for processing, embedding, cutting and staining (H&E and immunohistochemistry) tissues and sections. A multi-headed microscope linked to a monitor aids discussion of individual slides. There are two other single-headed microscopes linked to 3-chip cameras and monitors for teaching purposes.

The new (2014) clinical pathology laboratories are located close to the small animal consulting rooms and wards and provide automated clinical biochemistry and haematology, together with cytology, immunocytology and flow cytometry facilities, diagnostic parasitology and microbiology and a PCR room. There is a separate out-of-hours laboratory. A multi-headed microscope aids case discussions.

Table 7.2 Number of necropsies over the past 3 years

Species	Number of necropsies			Average
	2014	2013	2012	
Food producing animals:				} 45
cattle	19	19	21	
small ruminants	27	22	23	
pigs	3	1	0	
other farm animals	0	1	0	
Equine	11	21	2	11
Poultry	0	1	2	} 1
Rabbits	0	0	0	
Companion animals/exotic				} 158
dogs	79	84	81	
cats	32	32	39	
other*	36	48	43	

\* other = pet rabbits, pet avian species, pet reptiles, animals from local zoological collections

**Additional post-mortem material for teaching:** Abattoir material including porcine, bovine and ovine visceral material, is collected several times a year for use in practical pathology and Veterinary Public Health teaching in the 4<sup>th</sup> and 5<sup>th</sup> years. Uteri from farm species are collected from abattoirs and are used in gynaecology rotation practical classes. Equine heads, legs and bovine feet are bought in and used in dentistry, nerve blocking and foot trimming classes respectively.

Animal cadavers are also provided/donated for teaching. These are not subjected to a full necropsy but are used in a number of different ways for surgical dissections and other clinical exercises (dentistry, cadaver surgery, obstetrics, soft tissue surgery, symposia). As examples, in 2012-13 the numbers used were: Horses: 20 + 4 used for equine anatomy teaching (preclinical students); Bovines: 13; Dogs: 37 + 30 heads only for the canine dentistry practical; Cats: 13; Others: 1. In 2013-14, animals used for these purposes were: Horses 9 + 20 heads used for dental practicals; Bovines: 10; Dogs: 45 + 30 heads only for the canine dentistry practical; Cats: 1; rabbits: 20; Others 50).

### 7.1.3 Animal Production

Production animals available for teaching purposes are predominantly located on the University Farm, where there are the following animals available for teaching:

- Dairy Cows: 200
- Dairy young stock: 150
- Breeding Ewes: 205 with followers
- Breeding Rams: 7
- Vasectomised Rams: 7

Recent restructuring of the University Farm has enabled all cattle and sheep specifically maintained for the provision of teaching for the Department of Veterinary Medicine to be located on one site at Park Farm, Madingley.

In addition, the following livestock located on client farms were utilised for final year rotations (2013-14):

- Dairy cows: 240
- Dairy young stock: 100
- Beef cattle: 2500 (suckler cows and finishers plus 35 bulls)
- Sheep: 2640 ewes and 35 rams
- Goats: 65
- Pigs: 56 (including 5 boars)
- Poultry: 200 (ducks, geese, chickens and turkeys)

During the course of 2013-early 2014, the number of clients served by the Farm Animal Ambulatory practice increased to 55 clients and numbers of clients has increased further in autumn 2014 to over 80 clients, including one with a 300+ poultry flock.

The College of West Anglia, located at the northern boundary of Cambridge, also provides access to animals utilised for teaching purposes in 1<sup>st</sup> year (Principles of Animal Management course) and 4<sup>th</sup> year (rotation in exotic animals) as follows:

- Breeding pigs: 7 sows and 1 boar
- Growing pigs: c.50
- Poultry: c. 30 chickens; 35 turkeys; 15 ducks
- Camelids: 3 llamas and 2 alpacas.
- Goats: 7
- Rabbits: 32
- Cats: 7
- Dogs: c. 15 -20
- Birds: 22 budgies, 30 finches, 9 cockatiels, 11 quail, 3 canaries, 3 kakariki parrots, 2 lovebirds
- Small mammals: 22 guinea pigs, 16 chinchillas, 8 hamsters, 10 degus, 16 gerbils, 18 mice, 16 rats, 16 ferrets

- Reptiles: 9 snakes; 19 lizards; 15 tortoises, terrapins and turtles
- Amphibia: c. 8 frogs and salamanders
- Fish: c. 50 tropical and coldwater aquarium fish
- Invertebrates: c. 130 cockroaches, land snails and millipedes

#### 7.1.4 Food hygiene/Public Health

All farm animals available for clinical teaching are also available for the practical teaching of students in veterinary public health.

Details of availability of products of animal origin for the practical teaching of students in food hygiene, inspection and technology are given in SER 1 Chapter 4.

#### 7.1.5 Consultations and patient flow services

##### 7.1.5.1 Consultation

The clinics of the Queen's Veterinary School Hospital are open 52 weeks of the year. Routine consultations are held Mon-Fri, 08.45-17.15, and emergency consultations are taken outside these hours during week days and at weekends.

The Small Animal Hospital offers a comprehensive referral service for cats and dogs with expertise in all areas of soft tissue surgery, oncological surgery, orthopaedics, ophthalmology, cardiology, gastroenterology, endocrinology, dermatology, haematology, neurology, cancer chemotherapy and radiotherapy.

It seeks to provide the highest quality of clinical care and service to clients and to the veterinary profession and offers referral and advice in:

- Anaesthesia and intensive care
- Orthopaedics
- Soft Tissue Surgery
- Internal Medicine
- Diagnostic imaging, radiography, ultrasound, CT, MRI, scintigraphy
- Dermatology
- Oncology
- Neurology
- Ophthalmology
- Behaviour
- BVA/KC Hip/elbow and eye schemes
- Laboratory services – clinical and anatomic pathology including microbiology and parasitology

Details of the equine (equine medicine, surgery including first opinion and referral services, and reproduction and perinatal medicine) and farm animal services (farm animal medicine, surgery, fertility and herd health) are given below, and at [www.qvsh.co.uk](http://www.qvsh.co.uk).

The Department also provides veterinary services to the RSPCA clinic (first opinion clinic for clients that meet certain means-tested qualifying criteria) in Cambridge and

The opening hours for the RSPCA clinic are:

Tuesday, Thursday, and Saturday: 09.00-10.30, open clinic.

Wednesday: 09.00-10.30, vaccination, microchipping, neutering pre-checks and post-operative stitch removal only.

A 24/7 emergency service is also available for registered clients.

The Department also provides 24/7 veterinary services for the Blue Cross re-homing centre (for cats and rabbits) in Cambridge. Their opening hours are: 10.00-16.00, seven days per week.

Veterinary surgeons providing the clinical services, including farm animal and equine clinical services, and their Diplomate status (at 1<sup>st</sup> December 2014) are given in Appendix 4.

Both Senior and Junior Clinical Training Scholars also support provision of clinical services. Currently there are 14 SCTSs (all in small animal hospital) and 11 JCTSs (9 small animal, 2 equine and 2 farm animal). The small animal and equine hospitals, farm animal practice, and the anatomic and clinical pathology laboratories, also employ qualified veterinary nurses and specialist technicians.

### 7.1.5.2 Patient flow

Table 7.3 Number of cases: a) received for consultation, and b) hospitalised in the Faculty clinics, in the past 3 years

Species	Number of cases						Average cases seen		
	2014		2013		2012				
	a	b	a	b	a	b			
Food producing animals									
Bovine	8711	26	10716	23	33 <sup>\$</sup>	7	} 12002 <sup>\$\$</sup>		
Ovine, caprine	1879	64	2627	79	42 <sup>\$</sup>	15			
Porcine	30	7	21	3	0	0			
Other farm animals*	5	7	1	1	0	0			
Poultry	14	7	2	0	0	0	} 8		
Rabbits									
Equine	3219	153	2270	90	2146	62	2545		
Companion animals/exotics	Canine	4439	}	4442	}	4638	}	} 7256	
		Feline	2610	2328	2493	2396	2707		2412
			Other**	123	}	160	}		156

\* Other farm animals: alpaca

\*\* Other companion animals/exotics: rabbits (majority), rodents, reptiles

<sup>\$</sup> Excludes animals seen by ambulatory practice; data not available (new accounting systems introduced for 2013)

<sup>\$\$</sup> Average of 2013 and 2014

### Notes

1. Defined as number of animals hospitalised as opposed to number of days.
2. Hospitalisation in the small animal ward is recorded by patient not species, the approximate ratio of dogs: cats is 90% dogs: 10 % cats, occasionally other pets, e.g. rabbits or rats may be accommodated in the small animal ward.

### 7.1.6 Vehicles for animal transport

The Department owns two minibuses, each of which is fitted with a tow bar, and one trailer for livestock. It has a further 2-seater van for use in the ambulatory service.

Animals transferred from the RSPCA clinic to QVSH for referral are normally brought the veterinary school by the owners. Animals transported from the University Farm to the Department's farm animal clinical facilities are brought to the veterinary school using the Farm's vehicles.

### 7.1.7 On-call emergency service

The small animal, equine and farm animal services all provide a 24/7 on-call emergency service (as per RCVS Accreditation; see SER 2 Chapter 6) (and see below). The small animal services also provide an emergency/out-of-hours service for RSPCA clients and a 24/7 emergency service for the Blue Cross clinic.

### 7.1.8 On-farm teaching and outside patient care

The University Farm Dairy Unit has purpose-built teaching facilities. It currently milks 230 cows, and all calves are reared (replacements or fattening). A total of 660 cattle are currently managed by the farm, and there is also a sheep flock of 220 ewes. Other farm animal experience is provided by the Farm Animal ambulatory clinic (part of Cambridge Farm Animal Veterinary Services, the Department's farm animal clinical services). CFAVS performs approx. 350 visits annually attending to about 500 cases (and 2,300 fertility cases) per year, with a growing client base.

On occasion, farm animals are transported to the veterinary school for specialist treatment/care. These numbers are included in the tables above.

#### 7.1.8.1 Ambulatory (mobile) clinic

There is a mobile clinic for both farm animals and equines.

The hours of operation for both are 08.45 to 17.15 Mon - Fri, and 24/7 out of hours.

#### Farm Animal Practice

One minibus, with a seating capacity of 17, and two multi-purpose vehicles (MPVs), one with a capacity of 7 and the other with a capacity of 8, are available for transporting students on visits to the various farm premises, both to the University Farm and to external clients. These vehicles are used to transport staff and students to visit animals on a consultancy basis for second opinion work on occasions.

Emergency visits are made, as required, by the veterinary surgeon on the on-call rota.

Table 7.4 Number of cases seen by the Ambulatory (mobile) clinics in the past 3 years

Species	Number of patients			Average
	2014	2013	2012**	
Food-producing animals				)
cattle	8711	10716		)
small ruminants	1897	2627		)
pigs	30	21		)
other farm animals*	16	3		)
Poultry (no of flocks)	10	7		)
Rabbits (no of production units)	0	0	0	)
Equine	2631	1994	1951	
Other (cattle fertility)	2684	2400		

\* other farm animals: poultry, alpacas

#### 7.1.8.2 Other on farm services and outside teaching

The Department provides first opinion ambulatory veterinary services for equines and farm animal species.

The Cambridge Equine Hospital (CEH) comprises a first opinion practice and equine referral hospital, offering a complete veterinary service. Two veterinary surgeons are dedicated to working in the first opinion practice, in conjunction with interns and hospital-based specialists and provide full ambulatory services to clients whose horses are stabled within a 40 mile radius of the hospital. The first opinion practice offers a comprehensive and diverse range of services including routine healthcare, vaccination, annual health checks, worming, passports and micro-chipping, pre-purchase examination, lameness evaluation, dental care and many more treatments, including surgery and reproductive services; it also provides 'vet on call' services for local shows or pony club events. All students spend at least 2 weeks with the first opinion equine practice in their 6<sup>th</sup> year equine rotation.

The Equine Referral Hospital is an RCVS-accredited Equine Veterinary Hospital, fully equipped with surgical facilities. It offers innovative treatments for horses referred from vets all over the UK for advanced internal medicine, orthopaedic or elective surgical investigations and a 24-hour emergency referral service for cases requiring immediate specialist medical or surgical care. Many cases are internal referrals from the ambulatory first opinion practice. The equine hospital has 24 stables, dedicated isolation facilities, five treatment rooms with stocks and two surgical suites. All students spend at least 2 weeks in the equine hospital in their 6<sup>th</sup> year equine rotation.

The Department's Cambridge Farm Animal Veterinary Services (CFAVS) delivers the highest level of veterinary services to farms throughout Cambridgeshire and neighbouring counties through a team of dedicated farm animal vets. This ambulatory service is supported by a range of specialist expertise based at the Queen's Veterinary School Hospital and Cambridge Equine Hospital, providing a greater range of diagnostic, surgical and medical care. There is also a farm animal clinic based at the West Cambridge site which is available to CFAVS's ambulatory clients.

The service is delivered by a dedicated team of three Farm Animal Clinicians based within CFAVS, two Junior Clinical Training Scholars (interns) and a dedicated Farm Animal Technician who is a Diploma holder in cattle footcare and is experienced with handling, movement and restraint of all species. Services offered by CFAVS include: emergency care provision, advice on management of small scale farming operations and pet farm animal care and management, advice on strategic use of vaccines and wormers. Students spend two weeks with the ambulatory practice.

The students also spend a further 2 weeks on herd health/disease prevention aspects of farm animal practice, including: routine herd fertility visits using ultrasound scanners, routine flock health visits including flock preparation for lambing, bull and ram fertility testing, mastitis, milk quality and cell count advice and investigations, lameness prevention and investigation, provision of herd health plans for farms to comply with the requirements of Farm Assurance Schemes, advice on preventive medicine and disease control programmes and participation in recognised, accredited Health Schemes, metabolic profiling, young stock and heifer rearing programmes, and use of Interherd software to provide comprehensive analysis of health and fertility data and integration of information with NMR milk recording data. Students visit client's farms to conduct herd health assessments.

#### 7.1.9 Other information

Notable additional outside sources of material for clinical training purposes include the RSPCA clinic and the Blue Cross re-homing centre in Cambridge, and the College of West Anglia (CoWA) centre in Milton, Cambridge. The Department provides veterinary services to the RSPCA and Blue Cross, as outlined above.

All cases presented to QVSH are referral cases. First opinion cases are seen by the equine and farm animal ambulatory clinics and at the RSPCA and Blue Cross. Details of the opening hours and numbers of cases seen in these clinics are given above. The Department employs a veterinary surgeon to manage the RSPCA clinics; this individual is supported by all other staff in the small animal medicine team plus SCTSs.

### 7.1.10 Ratios

Table 7.5 Animals available for clinical training (in the clinics of the Faculty or seen through the ambulatory clinic) as ratio to the number of students in last full year of clinical training.

	Indicator (Ratios)		Denominator	
R11:	no. of students graduating annually	71	1	: 1.56
	no. of food-producing animals seen at the Faculty	111	1.56	
R12:	no. of students graduating annually	71	1	: 9.58
	no. of individual food-animal consultations outside the Faculty	680	9.58	
R13:	no. of students graduating annually	71	1	: 0.70
	no. of herd health visits	50	0.70	
R14:	no. of students graduating annually	71	1	: 5.66
	no. of equine cases	402	5.66	
R15:	no. of students graduating annually	71	1	: 1.84
	no. of poultry/rabbit cases	131	1.84	
R16:	no. of students graduating annually	71	1	: 101.01
	no. of companion animals seen at Faculty	7172	101.01	
R17:	no. of students graduating annually		1	: see notes
	Poultry (flocks)/rabbits (production units) seen			

Table 7.6 Animals available for necropsy

	Indicator (Ratios)		Denominator
R18:	no. of students graduating annually	71	1
	_____ = _____ = _____		: 0.85
	no. of necropsies food producing animals + equines	60	0.85
R19:	no. of students graduating annually	71	1
	_____ = _____ = _____		: 0.08
	no. of poultry/rabbits	6	0.08
R20:	no. of students graduating annually	71	1
	_____ = _____ = _____		: 2.07
	necropsies companion animals	147	2.07

**Notes on ratios**

R11: The figure of 1.49 is outside the RCVS established range of 2.47-1.73. This reflects the balance of cases seen by the students – most food-producing animals are seen by students on the farm of origin, either at the University Farm or on other farms during the ambulatory practice part of the final year Farm Animal Rotation (see also R12). It should be noted that the number of students graduating in 2013 (the basis of the ratio figures here) was larger than usual. Between 2008-2013, the mean number of students graduating per year was 59.3. Using that group size, the R11 figure would be 1.80, within the RCVS established range.

R12: The figure of 9.58 is well above the RCVS established range of 2.56-1.02 and reflects the high number of animals seen in the ambulatory Farm Animal Practice.

R13: The figure of 0.70 is above the RCVS established range of 0.20-0.09. In the final year farm animal rotation, each student goes to farms, on their own, to conduct one of a number of types of herd health assessment: fertility routine visits, mastitis and milk quality routine visits, lameness assessment routine visits, herd nutritional assessments. The student must submit a report on each visit; these reports form part of the rotation assessment. Each student conducts at least 3 routine fertility visits and one each of mastitis and lameness assessment per ambulatory element of the final year rotation.

R14: The figure of 5.66 is above the RCVS established range of 1.72-0.92 and reflects the structure of the Cambridge Equine Hospital and its ambulatory service. In the last year, 402 cases were seen at the referral hospital.

R15: The figure of 1.84 is above the RCVS established range of 0.58-0.37. This reflects the nature of some farms serviced by the Farm Animal Practice where small-medium flocks of chickens, turkeys, geese, and ducks are kept. Students therefore see the “backyard”-type flocks on their farm animal rotation.

R16: The figure of 101.01 is well above the RCVS established range (48.74-37.94) and reflects the numbers of animals presented to the QVSH in the Department, the RSPCA clinic and the Blue Cross. The RSPCA and Blue Cross clinics are run by the Department.

R17: The nature of the large-scale commercial poultry industry in UK is not conducive to student learning. Also, such units have high biosecurity levels that are not suitable for visits by student year groups. In UK, the proportion of the profession in specialist poultry practice is very low; practising veterinarians are more likely to attend the “backyard” type of small flock. In the ambulatory practice element of the final year farm animal rotation, students go to farms that have such flocks (there are over 10 of these in the clientele of the Farm Animal Practice) and gain a much more hands-on experience. An Associate Lecturer in the Department is a partner in a local specialist poultry practice and those students with a particular interest in poultry can (and have) spent time with that practice on EMS.

R18: The figure of 0.85 is above the RCVS established range (0.75-0.46)

R19: The figure of 0.08 is below the RCVS established range (0.26-0.12) but does not include poultry cadavers used in VPH teaching. Students examine such poultry cadavers on at least 4 occasions during their course (three times in the Department and once at Bristol abattoir) with multiple cadavers available on each occasion. Students will also examine poultry at ante-mortem inspection and condemned carcasses in their visits to poultry slaughterhouses (from Lent Term 2015).

R20: The figure of 2.24 is above the RCVS established range (1.26-0.89). Students conduct at least 2 post-mortem examinations during their 4<sup>th</sup> year pathology rotation and participate in other post-mortem examinations during final year rotations.

#### 7.1.1.11 Other species

The Department does not provide services relating to farmed fish or food producing species other than ruminants and pigs. Specialist poultry veterinary practices and fish experts in the Cambridge area act as external lecturers and provide EMS opportunities for Cambridge students.

## 7.2 Comments

We are largely content with the ratios above. Overall, they reflect a large clinical caseload and small year cohorts.

The Department considers that the relative percentage of first opinion and referral cases seen by students is appropriate and provides an excellent range and number of cases for the student cohort size (further experience is gained during extra-mural studies, some of which is compulsory first opinion practice in dogs/cats, equines and farm animals).

The number of farm animal clients has increased to over 80 in the past two years, providing excellent caseload level for student teaching, together with herds for health management teaching. The equine ambulatory practice has also expanded its client base during this time.

The Department's pathology staff continue to establish relationships with organisations that provide a regular supply of teaching materials across different species.

A suite of new consulting rooms, pharmacy, clinical research laboratory and small animal surgical facilities was opened in October 2014 (see SER 1, Chapter 6). Refurbishment of equine clinical facilities and farm animal facilities was also commenced in 2014.

The clinical pathology diagnostic laboratories, including an out-of-hours laboratory, were relocated in November-December 2014 to a more central position within the small animal hospital.

Obtaining access for whole year groups to large commercial poultry units remains a problem. The Department has an Associate Lecturer in poultry practice who is liaising with the VPH staff to explore possible solutions. VPH teaching has expanded in 2014-15 to incorporate visits to local slaughterhouses and meat processing plants, including white meat plants. This will allow a more integrated approach and insights into the role of veterinarians at different stages of commercial poultry production "from farm to fork".

In the small animal hospital, staffing remains a key area of concern in teaching and clinical services. In several clinical disciplines, expertise is 1-person deep. The Department is conducting a forward planning exercise to consider how to replace staff due to retire in the next few years and to strengthen vulnerable areas. It is important that the Department is provided with sufficient resource to employ staff of sufficient experience and seniority.

Both the CEH and CFAVS have expanded their client base in the past 2 years and it is important to continue to provide a high-quality service to clients while delivering excellent teaching and learning experiences. These services would benefit from searchable computerised medical records. Staffing is a critical issue in delivering both ambulatory and referral services and further staffing resource is needed.

The vehicles for both CEH and CFAVS – practice vehicles and student minibuses/MPVs are ageing and in need of replacement. Several key items of diagnostic equipment are outdated and need to be replaced by more modern equipment.

Computerised medical records should be provided in the equine and farm animal areas

Replacement vehicles in equine and farm animal areas should be resourced to ensure access to animals for clinical and teaching purposes.

The Department has published codes of practice for use of animals for teaching purposes and these are reviewed periodically by its Ethics and Welfare Committee (there are separate statements for dogs, horses, cattle and sheep and include frequency of rectal examination of cattle and sheep). These codes of practice are published on the Department's intranet. Post-mortem examinations are conducted only with the written informed consent of owners; the consent includes the use of cadavers for teaching (education) and clinical research purposes. The Departmental policy is that all research projects that involve the use of live animals, and that are

not covered by the Animals (Scientific Procedures) Act, 1986, including final year student elective projects and Clinical Training Scholar projects (see Chapter 12), must be approved by the Department's Ethics and Welfare Committee

### 7.3 Suggestions

We will continue our endeavours to increase the amounts of necropsy material available for teaching and to improve the efficiency of how this is used.

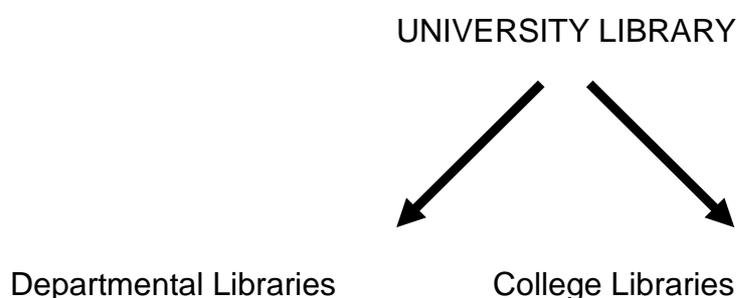
## CHAPTER 8

### LIBRARY AND LEARNING RESOURCES

#### 8.1 Factual information

##### 8.1.1 Library and other Information Technology services

The structure of the libraries within the University of Cambridge is that both Departmental and College libraries are managed under a central organisation as follows:



Funding for College libraries comes from University and College sources; funding for Departmental libraries is via University resource allocations.

#### **Library access for veterinary students**

The veterinary library is situated in the main building of the Department and is the primary source of veterinary information within Cambridge.

#### **Subsidiary libraries**

Veterinary students have access to the main University Library, which holds a limited source of veterinary information. Access to College libraries is restricted, and only members of a given College can gain access to that College's library. Students also have access to other University libraries, e.g. the Central Science Library, University Library (UL) and the Library at the School of Clinical Medicine.

#### **Library management**

The Departmental library is run by a full-time Librarian with Chartered Librarian status, who makes decisions about its day-to-day running. Any decisions requiring discussion are taken in consultation with the Academic Library Advisor, and longer-term issues of policy and resources are referred to the Library Committee, which meets twice a year.

## **Budget and costs**

The Secretary of the Department sets the annual budget, which is then subdivided into four areas of expenditure:

- Periodicals
- Books including e-books purchased through the UL
- Binding
- Sundries

The overall expenditure for the Departmental library in the last three years was:

- 2011/2012 - £52,036
- 2012/2013 - £52,036
- 2013/2014 - £52,036

The annual budget is always spent. A large proportion of the budget is spent on provision of e-journals, provided via the University Library.

## **Opening hours**

The library has 85 reading places. Members of the Department have access 24 hours a day, 7 days a week. Loans out-of-hours are possible 24/7. Non-members are admitted only by prior arrangement with the Librarian and Head of Department.

## **Accessions**

The library subscribes annually to 29 periodical titles, but many more titles are available electronically via the University Library's electronic journals database, towards which the Department contributes £ 39,000 per annum. These are available free of charge to students.

There were 115 book accessions for the academic year 2012-2013 and 121 hard copies plus 9 e-book licences (total 130) in 2013-14. The number of loans has decreased slightly since before then due to the availability of e-books direct from the Newton catalogue in the UL. The University's spend on provision of e-books has increased and there continues to be an increase in the veterinary and veterinary-related subject field.

## **Loans**

The number of loans made to students for the academic year 2013-2014 was 1,235, a similar number to the previous year.

The access to information within the University is dynamic and moves at a great pace. Student expectations on being able to access data is high on their list of priorities and they have a complete understanding of modern technology. Most of them will either have a smart phone, iPad or Kindle to enable them instant access and the University is moving to provide comprehensive access along these lines

With this in mind much of the electronic information required is collected and disseminated centrally by the University library. The Departmental library is part of the libraries@cambridge network and shares the centralised catalogue holding

information on electronic journals and book availability. There is now greater numbers of both books and journals available as electronic downloads. This has an effect on the number of titles the Departmental library holds and on library loans. The Departmental library still purchases books that are not as yet available as e-books.

The number of loans has decreased slightly in recent years due to the availability of e-books direct from the Newton catalogue. The University's spend on provision of e-books has increased and there continues to be an increase in the veterinary and veterinary-related subject field.

The departmental website is also a source of information as all day-to-day information is posted under the "Current Student Information" tab. Information on timetables, electives, policies etc. is also available to students through that route.

### **Literature searching**

There are four computerised literature-searching systems that are available to members of the University. These are located via the library link at: <http://www.vet.cam.ac.uk>. The systems available are:

- Web of Science at ISI
- PubMed at NIH
- ZETOC - electronic table of contents
- Scopus
- Google Scholar

### **Union Catalogue**

An online Union Catalogue providing information on the holding and location of books and periodicals throughout the University is available from the dedicated computer workstations within the Department.

### **Security system**

A security system for the library has been installed recently at a cost of £9,000, funded by the Veterinary School Trust (CamVet).

## College library support for students

The Colleges are circulated annually with a list of books essential to veterinary students at both the preclinical and clinical stage. Most Colleges provide excellent support in providing copies of veterinary texts for the use of veterinary students.

Departmental library:		
- is this specific to the veterinary training establishment?	yes	
- is this common to two or more establishments?	no	
State the library's annual operating budget over the past three years:	GBP	Euros
	2013-14	52,036 76,493
	2012-13	52,036 76,493
	2011-12	52,036 76,493
Number of full-time employees	1	
Full time equivalents of part time employees	0	
Number of journals received each year (in addition to books)	29*	
Number of student reading places	85	
Library opening hours:	weekdays	weekends
	during term-time	24hrs 24hrs
	during vacations	24hrs 24hrs
Number of loans to students per academic year	1, 235	

\* This number is lower than in previous years (down from 95), reflecting the change in the way journals are provided. The policy is to eventually provide electronic access to all titles. When the title becomes available electronically the paper copy is cancelled. While this results in fewer paper copies on the library shelves the overall benefit is that we have greater access to more titles via the catalogue provided from the University's journal coordination scheme. The e-journals are heavily used.

## Audio-visual Service

The Department does not have an audio-visual service, but there is a central University audio-visual service, which is able to provide a wide range of services

from production of photographs and posters to video material for teaching. In addition to the University Audio-visual Service, the Department of Anatomy runs a full digital service to supporting teaching, which is used by members of the Department.

### **IT support in the Department**

The Department commissioned a full review of its IT infrastructure support in summer 2012. Following the recommendations of the review it explored the options for outsourcing its IT support. From September 2013, IT support to the Department has been provided centrally by University Information Services (UIS). The Department previously employed two members of IT staff directly (1.25 FTE). Under the outsourcing arrangement, it pays at cost for 4 members of staff (3.2 FTE) who are seconded to work in the Department (this will reduce to 3 staff, 2.2 FTE from October 2015 if current IT goals are achieved). Since September 2013, the Department has injected significant funds into its IT infrastructure. A successful bid was made to the central University for £60,000 to support provision of a server infrastructure. The Department took the opportunity of the building redevelopment in the Hospital to provide a dedicated acclimatised server room. The additional investment of funds in IT support has brought the following benefits. The UIS members of staff work flexibly to provide support at all levels across the Department, and when specialist advice is required (e.g. networking issues), additional specialist staff support is brought in from the University Information Services (UIS) on an ad hoc basis at no charge. The part-time senior UIS staff member has a management and strategic planning role. This has enabled forward planning of IT infrastructure change, leaving the 3 full-time UIS members free to implement change on the ground. Since September 2013, the UIS has undertaken a thorough overhaul of networking and network access; has provided dedicated servers in the Department and secure off-site data storage for information held on the servers; has introduced Wi-Fi throughout the Department; has set up an inventory of all IT equipment and is systematically upgrading local PC and Mac provision as needed; and has earmarked on projects to support specialist IT needs in the Hospital.

### **IT facilities**

The University policy is to encourage self-learning throughout the course, and it has developed IT resources to support this. Members of staff are encouraged to develop CAL, and support is available from IT staff.

The Departmental IT provision for students is managed by the University Information Services. The provision of 37 seats in the computer room meets current need. A wireless facility throughout the Department, including the Student Resources Centre ensures that access to the University network from personal IT devices is almost universally available.

The Department's infrastructure provides 100 Megabit switched Ethernet to all buildings where network access is required, with a 1 Gigabit downlink to the University network. This supports research, administration and the Hospital computer system.

Networked computers with data projectors are available in the two lecture theatres and in three seminar rooms.

The Departmental website carries information for students and staff, and email is used for day-to-day staff-student communication.

Is the computer service/department:		
- specific to the veterinary training establishment?		no
- common to two or more establishments?	*See note below	yes
Number of full-time employees		3
Full time equivalents of part time employees		0.20
Number of computers available in the service:		
- less than three years old		37
- more than three years old		0
Do students have free access to these computers for their own use?		yes
Is there a computer room for self-use by students?	Computer room and Library	yes
If there is, please indicate:		
- the number of places		37
- the opening hours:	weekdays	weekends
during term-time	all	all
during vacations	all	all
Does the service/department provide teaching in the use of computers?		support provided
Does the establishment use interactive CD-ROM for teaching?		(Yes)*
If so, how many programmes are available?		160

\* The Departmental library holds a stock of interactive CDs for teaching. In the past these were borrowed as a teaching aid. However, advances in computer technology means that these resources are now available on line and so the CDs themselves are now rarely used.

## Virtual Learning Environment (VLE)

Students in their clinical years have access to a web based University learning management system (LMS), CamTools, where staff can post lecture notes and tutorials, and the student administrators place notices.

Improving the University's Virtual Learning Environment (VLE) became a pressing issue in 2012 as the SAKAI platform for the existing VLE, CamTools, was to be no longer supported. As a result, the University's Centre for Applied Research in Educational Technologies (CARET) conducted a review of options for VLE provision. The decision was made to replace CamTools with Moodle as the University's VLE platform. This transfer was piloted across a limited number of Departments/Triposes within the University, including the School of Biology and its Natural Sciences Tripos (NST) and Medical and Veterinary Sciences Tripos (MVST). Moodle offers not just an access function for lecture slides/handouts and other supplementary material, such as CAL packages, but other functions that will be developed in the coming years. The pilot started for the 2013-14 academic year and so Moodle is the VLE for 1<sup>st</sup> and 2<sup>nd</sup> year veterinary students; thus the Department currently uses Moodle for the PAM and PfVP courses only. CamTools will be replaced across the whole of the University by Moodle in summer 2015 at which point it will become the VLE used by 4<sup>th</sup>-6<sup>th</sup> years also.

### 8.2 Comments

The University, College and Department library facilities are excellent, and adequate for the number of students on the preclinical and clinical veterinary course. The strengths in the library provision are the 24-hour opening of the Department's library, and the additional provision of library facilities elsewhere in the University and Colleges.

The Departmental Librarian also manages the Department's website.

The Departmental website has been updated and improved with the introduction of the University-wide Falcon template. With the increased development of technology, the reliance on accessing information via computers, tablets and smartphones has increased. The site carries much information under a series of specific headings with "student information" commanding a heading of its own.

All information needed by students is collected and disseminated from this link. The pages form part of the Department's intranet. It has developed into a focal point of where to initially find relevant information.

The site is heavily used by all years for access a range of information from daily timetables to policies. It is regularly updated to provide the latest data. There is now the ability to access e-books and e-journals from links on the Department's web page resulting in remote methods of study.

There is also an updated section relating to potential student applicants. It provides information for prospective students looking to study veterinary medicine as a career.

This area of the website receives many hits confirming that it is easily accessible to the outside world.

CamTools is being phased out by the University and is being replaced by Moodle. The transfer of Departmental CamTools pages to Moodle will occur over the summer of 2015. The Academic Support Officer, who uploads most of the Department's teaching and other materials onto CamTools has attended Moodle training sessions.

### 8.3 Suggestions

Those CAL packages held by the library have not been updated in recent years, reflecting increased use of the CamTools virtual learning environment (shortly to be updated to Moodle with its greater range of functional modalities). An audit of those packages held in the library should be conducted and only programmes useful to students retained. Greater use of CAL is encouraged as part of the ongoing teaching strategy to broaden methods of delivery.

## CHAPTER 9

### ADMISSION AND ENROLMENT

#### 9.1 Undergraduate courses

All students undertaking the veterinary course (VetMB) are enrolled for a Bachelor of Arts (BA) degree (University of Cambridge does not offer a Bachelor of Science degree). The BA (Hons) degree is awarded after three years of study except for students who already have an honours degree in a relevant subject from another university (“affiliated students”), in which case they are awarded a BA (Ordinary) after two years of study.

##### 9.1.1 Undergraduate student numbers

Table 9.1 Undergraduate student composition in the year prior to visitation  
(2013-14)

Year of course	Number of students		
	male	female	total
1	18	57	75
2	19	43	62
3	15	48	63
4	17	49	66
5	18	49	67
6	14	58	72

##### 9.1.2 Student admission

###### Admission requirements

Admission to any undergraduate course at University of Cambridge is via the Cambridge Colleges. Currently 22 of the 31 Colleges admit veterinary students.

The University of Cambridge Admissions Website states that “with the exception of those for Medicine and Veterinary Medicine (grade C or above in GCSE Double Award Science and Mathematics), there are no GCSE requirements for entry to Cambridge, and there is no minimum number of A\* grades required for any of our courses”. The website gives further clarification: “students wishing to study Veterinary Medicine must have achieved grade C or above in GCSE (or equivalent) Double Award Science and Mathematics (two single awards in GCSE Biology and Physics may be substituted for Double Award Science). Applicants must have AS or A Level passes in Chemistry and two of Biology/Human Biology, Physics, and Mathematics. At least one pass must be at A Level.”

These criteria are likely to change following recent reforms to the Year 12-13 school curriculum. Details of other school qualification (IGCEs, Pre-U, International Baccalaureate, Scottish qualifications, etc. are given at <http://www.study.cam.ac.uk/undergraduate/courses/vetmed/> but the current criteria

for AS and A2 levels are that applicants must have AS or A Level passes in Chemistry and two of Biology/Human Biology, Physics, Mathematics. At least one pass must be at A Level. Most applicants for Veterinary Medicine at Cambridge have at least three science/mathematics A Levels and some Colleges require this and/or ask for particular A Level subject(s).

The standard offer, for 2015 entry, was set at A\*A\*A in Chemistry, Physics, Biology/Human Biology or Mathematics. For candidates taking 2 science or mathematics subjects at Advanced GCE with one or more non-science subject(s), the typical offer is likely to be 2 A\* grades in the Advanced GCE science/mathematics subjects plus an additional A grade in one other Advanced GCE subject. In addition, such candidates would be expected to achieve an A grade in a third science or mathematics subject at Advanced Subsidiary GCE.

Although some Colleges consider applicants offering only two science/mathematics subjects at A Level, the success rate of such applicants is much lower historically. In the past three admissions rounds, 94 per cent of applicants for Veterinary Medicine offered three or more science/mathematics A Levels and, of these, 24 per cent were successful in obtaining a place. Of the six per cent of applicants who offered only two science/mathematics A Levels, just four per cent were successful in gaining a place.

### **Admission selection process**

The selection process is handled by the Colleges, which are responsible for admitting students to all undergraduate courses. All Colleges involve veterinary-qualified personnel in their admissions interviews. The selection process takes into account: the candidate's school examination record; their school or sixth-form college reference; their UCAS personal statement; the results of a common Biomedical Admission Test (BMAT); and one or more interviews (usually two interviews each with two interviewers). All applicants to Cambridge with good examination results and a favourable school report are normally offered an interview. Applications are submitted in October, for entry into the course in the following October or a year later for deferred entry. The BMAT is conducted during November and interviews are held in December and, rarely, January. Conditional and unconditional offers are normally made during January. The rigorous school examination requirements, BMAT and interview ensure that all candidates have a sound foundation in the basic sciences and mathematics before admission to the course.

### **Annual intake and college allocations**

The target number of students admitted per year is calculated to result in 65-70 students entering the 6<sup>th</sup> year of the course. The target number of offers is adjusted to take account of the (relatively low) rate of withdrawals by those holding offers and wastage during the course. Thus, for example, for applications in October 2015, the maximum number of possible offers was 81, with a view to admitting 72 first year students, and eventually seeing 65-70 start the fourth year clinical course. No changes to the number of students admitted annually are currently expected. The target number is achieved by application of a suitable cover ratio for the total number of conditional offers. Currently, 22 colleges admit veterinary students and the number of offers each college may make is determined by the Director of

Admissions for the Cambridge colleges, in agreement with college Admissions Tutors.

All applicants to Cambridge are interviewed by a particular College. Each College has a 'quota' of veterinary places, which they notionally offer (although the number of places actually offered by each college is open for negotiation at an all-colleges moderation meeting that takes place in December, immediately after the interviews are conducted). If the applicant is subsequently offered a place to study Veterinary Medicine, it may be by the college that interviewed them, or it may be by another college that offers them a place via the moderation process. In any one year, some colleges will have many more strong applicants than they have places, and others will have a smaller number of strong applicants. For this reason, it is important that there is a central moderation procedure – the 'intercollegiate admissions pool' – that ensures that the best applicants are offered places, whilst allowing colleges to maintain their relative autonomy.

### **Moderation of veterinary offers**

At the end of the interview period in December all veterinary candidates are given a ranking score according to an algorithm agreed by the Cambridge Admissions Forum in consultation with Preclinical Directors of Study in Veterinary Medicine and College Admissions Tutors. The ranking takes account of the number of passes at GCSE A and A\* (a correction factor is applied according to school type), the AS module scores to date, and the marks from BMAT papers 1 and 2.

All these data are entered on a spreadsheet that is circulated prior to the interviews, to give all Colleges an indication of the 'gathered field' of applicants. This is important because of the potential for uneven distribution of applicants to different Colleges as outlined above. (Affiliated [see above] and mature students [those over the age of 21 on October 1<sup>st</sup> of the year in which they start the veterinary course] are also entered on the spreadsheet but tend to be dealt with separately by the colleges that specialise in admitting them). After the interviews, Colleges decide on the basis of both the pre-interview and interview performances of the applicant whether to reject the applicant, give a conditional offer, or, in the case of strong candidates to whom the college would like to make an offer if they had more places, to enter them into the Intercollegiate Admissions Pool.

Soon after the interview, and moderation meetings and Pool are over, representatives from all the Colleges concerned gather for a second, early-January, moderation meeting at which final decisions are made about offers to candidates.

At the end of this process, a small number of the best remaining candidates (typically 3) are given 'open' offers. These are to increase the 'cover ratio' to allow for candidates who subsequently turn down their offers. These candidates are offered a conditional place at Cambridge but at a college to be determined later in the year when withdrawals or failure to achieve grades have been established. Three Colleges 'underwrite' the scheme and have agreed to take 'open' offer candidates if necessary, in the event that other colleges do not take them.

This moderation scheme is considered to be successful in providing a fair and transparent distribution of the best candidates among the Colleges that accept veterinary students.

The University of Cambridge does not participate in the national UCAS clearing scheme.

Relatively few applicants request deferred entry, so usually more than 95% of successful applicants start the course in the year immediately following the one in which they applied.

### Transfers from other courses

There is a mechanism whereby students can apply to transfer from other courses, e.g. Natural Sciences or Medical Sciences, into the veterinary course at the end of the 1<sup>st</sup> or 2<sup>nd</sup> Year. In practice, the number of such transfers is very small («1 per year), must be within the agreed quota and is normally into the 1<sup>st</sup> year of the course.

Table 9.2 Intake of veterinary students in the past 5 years

Year	Number applying for admission	Number admitted	
		'standard intake'*	other entry mode**
2014	249	not yet known	
2013	347	67	2
2012	414	66	7
2011	432	64	2
2010	417	70	3
2009	438	69	6
2008	412	70	3

\* 'standard intake' = students applying in Year 13 of their school career or older applicants who are studying AS/A2 courses (or equivalent) after leaving school ("Mature applicants", some of whom may have a Bachelors or other degree in a subject that does not include a biological science; mature applicants undertake the full 6-year course)

\*\* 'other entry mode' = Affiliated students. These students already have an Honours degree in a relevant subject and do not take the Part II year (and are therefore on a 5-year course). There are no transfers of students onto the VetMB course from other subjects apart from starting the course in 1<sup>st</sup> year.

### 9.1.3 Student flow

Table 9.3 Student flow and total number of undergraduate veterinary students

Check with RCVS exactly what they want here – visitation guide not completely clear

Number of students present after admitted year 1		Number of additionally admitted students
1 <sup>st</sup> year (2009-10)	73	0
2 <sup>nd</sup> year (2010-11)	71	0
3 <sup>rd</sup> year (2011-12)*	63	0
4 <sup>th</sup> year (2012-13)**	66	0
5 <sup>th</sup> year (2013-14)	65	0
6 <sup>th</sup> year (2014-15)	65	0
>6 <sup>th</sup> year (matriculated pre 2009) ***	3	0
Total number of students lost/gained	lost - 8	gained- 0

\* Less 6 affiliated students

\*\* Includes 6 affiliated students who matriculated in 2010

\*\*\*Two of these three are included in numbers for 4<sup>th</sup> and 5<sup>th</sup> years

#### Notes

- Of those students who left the course:
- Two students left the course after their 1<sup>st</sup> year – one transferred to the Natural Sciences Tripos and the other left the University to pursue studies elsewhere.
- Five students left the course after the preclinical course having failed 2<sup>nd</sup> VetMB exams (but did complete a Tripos).
- One student left during 4<sup>th</sup> year to pursue veterinary-related studies elsewhere.
- Two students are due to complete the course in 2015 >6 years after matriculation having intermitted due to illness. One student will complete the course after 2015 (has been given leave to complete the course over a longer period of time due to illness)
- Affiliate Students do not take the Part II in year 3 and move directly from year 2 to year 4. This is a confounding factor in the above figures. Within the Tripos system, students requiring additional attempts in year 1 or year 2 2<sup>nd</sup> VetMB examinations are able to do so in years 2 and 3.
- Students not completing the 2<sup>nd</sup> VetMB exams nevertheless generally complete a Tripos leading to the award of the degree of BA (Hons) after 3 years. Occasionally a student transfers from the Medical and Veterinary Sciences Tripos to the Natural Sciences (or other) Tripos after year 1.
- It is rare for a student to transfer in to the veterinary course after year 1 of the course. Transfer students are normally required to start at the beginning of year 1 of the veterinary course.

Table 9.4 Number of students graduating annually over the past 5 years

Year	Number of students graduating		
	June	September	Total
2014	69	2	71
2013	56	4	60
2012	53	5	58
2011	57	4	61
2010	53	3	56

Table 9.5 Average duration of studies (distribution of students in years)

Year	Number of students graduating			Average duration of studies
	After 5 years*	After 6 years**	After 7 years***	
2014	5	64	2	5.96
2013	5	53	3	5.97
2012	2	53	2	6.00
2011	3	52	4	6.02
2010	6	51	2	5.93

\* Affiliated students (have previous honours degree at 1<sup>st</sup> or 2i level in a relevant biological subject; do not undertake MVST Part II

\*\* Standard length course

\*\*\* Usually students who have intermitted for one year; mostly for reasons related to health issues

The academic reason why students leave the course is because they have not passed VetMB examinations within the permitted number of attempts. These students can still obtain a BA (Tripos) degree. Other students choose to leave the course, either because their academic interests lie elsewhere and/or because they wish to undertake a research career rather than a veterinary career. There are very few students who leave, or fail to complete, the clinical course once they have started it.

## 9.2 Comments

All students starting the course have excellent academic qualifications and have demonstrated at interview appropriate motivation and professional suitability for the veterinary course.

The admissions quotas set out by the Veterinary Quota Committee aim to result in the admission of a maximum of 81 Veterinary Medicine students a year, notionally divided as follows: 75 admissions of standard age, 2 mature students and 4 affiliated students. Affiliated students are graduates who normally already have a good science degree (normally a 1<sup>st</sup> or 2i classification), who then complete the Vet MB course in 5 years (omitting Year 3 of the preclinical course).

The existing facilities are adequate to train the current annual target class of 65-72 students entering the 4<sup>th</sup> year of the course.

For the first three years of the course, students are monitored each term by means of electronic reports (CamCORS) from College supervisors in each subject to the student's Director of Studies and Tutor. Typically the student meets his or her Director of Studies at the beginning and end of each term to discuss progress. During the clinical years this monitoring role is largely taken over by the VSCSs. Some Colleges have separate preclinical and clinical DoS; the latter may or may not be the VSCS.

The quality of the students and the close monitoring of their progress has a successful outcome, as evidenced by the very low number who fail examinations or change to other courses. The number of students who fail to complete the veterinary course at Cambridge is low. This success is likely to be related to the high academic standards at entry, and the intensive selection process whereby each candidate is considered on merit, and suitability for the course, as well as to the support mechanisms available to individual students through Colleges and Departments.

Another likely reason for the relatively low rate of loss of students from the veterinary course is the pastoral care system offered by the Colleges. On arrival at Cambridge, each student is allocated a pastoral 'Tutor', with whom they meet several times a year, and whom they can approach at any time if they experience problems with health, welfare, financial, family or general work issues. The Tutor is the first step in accessing a wide variety of pastoral resources, including college nurses and counsellors, the University Counselling Service, financial advisors, and student union welfare provision.

The Medical and Veterinary Student Progress Panel is a further source of advice to Colleges and students. The aim of the Panel is to aid co-ordination of support services and advice and to monitor performance and progress of individual students through their course.

In recent years, a number of candidates who have been offered places at Cambridge have withdrawn later in the application period, shortly before commencing the course. Measures to offset the loss of these candidates who decline their offer or those who withdraw at a later stage have been introduced and appear to be satisfactory.

Current selection criteria at admissions are supported by a range of data. The most reliable predictor of student performance in the Tripos is the UMS (Uniform Mark Scale) score based on assessed performance in AS modules. The recent Government changes to the Year 12-13 advanced level courses in schools – from a modular to linear assessment system – means that UMS data will not be available after 2015/2016. The impact this may have on admissions procedures within the University is under consideration by Cambridge Admissions Office. (Further consideration of this is discussed in SER 2, Chapter 2.)

The Cambridge admissions procedures are supported by considerable amounts of contextual information; the impact of school curriculum changes and other factors on the overall profile of students applying to study Veterinary Medicine is monitored by

the Cambridge Admissions Office and details sent to Subject Convenors and Colleges.

All Colleges now have a Widening Access Officer (or equivalent, e.g. Widening Participation Officer) and the University has a clear Widening Access policy. The University runs Sutton Trust Summer Schools in veterinary medicine and both the University and Colleges run many other many general events for teachers and prospective applicants. All Colleges provide funds to support students; there are various sources of such support, e.g. the Cambridge Bursary Scheme and additional hardship / travel / EMS funding. They also provide subsidised accommodation for at least three years for all students. Uniquely among UK veterinary school, the Department provides some funding to clinical students to support their clinical EMS and the compulsory week at the teaching abattoir at Langford, Bristol.

The Department of Veterinary Medicine organizes an annual VetCam event for up to 150 Year 12 students. This 2-day residential course provides up to 10 full bursaries. Schools are asked to submit a form giving information about the potential awardees. This form gives information on family history of involvement in higher education, their student's academic ability and their family's financial background. These are viewed by the Department's Schools Liaison Officer and other members of the Schools Liaison Group, to determine the most worthy applicants for the bursaries. The bursaries cover all the costs of attending the VetCam event, including return travel to Cambridge. It is hoped that we will be able to expand the number of bursaries awarded for the 2015 VetCam course, thus ensuring that a wider group of Year 12 students will be able to participate and be inspired to make an application in October. The feedback we have received from past bursary applicants shows that without the award, they may not have been encouraged to attend the VetCam course. The bursary scheme will be continued to generate more applicants from this small group.

The University also runs a one-week Sutton Trust Summer School every year. Eight prospective veterinary and 32 prospective medical students are selected by the Trust on the basis of educational achievement in the face of socio-economic and educational disadvantage. The academic programme is arranged two college Admissions Tutors, one of whom is a vet. The Summer School consists of lectures, seminars and practical sessions in the departments of: Physiology, Development and Neuroscience; Pharmacology; and Veterinary Medicine. The attendees are also introduced to the Cambridge supervision system by way of small-group teaching sessions, after which they prepare and deliver a presentation on a biomedical topic. Finally, they attend a session which introduces them to the process of application to the Cambridge veterinary and medical courses. In 2013, one pupil who had been on the 2012 Sutton Trust Summer School started the VetMB course; 4 of those who started the course in 2014 had been on the 2013 Summer School. It will be important to continue to run this course, as part of the widening access initiative in the University.

The Department recognises that it needs to increase its profile to school pupils and has redesigned its own admissions webpages in recent years. It is committed to attracting applications from school pupils from diverse backgrounds, together with attracting applications from mature and graduate students. The Department will continue to liaise with Colleges' widening access teams in promoting the veterinary course.

### 9.3 Suggestions

We have no suggestions.

## CHAPTER 10

### ACADEMIC AND SUPPORT STAFF

#### 10.1 Factual Information

The requirements of the evaluation procedure for this Chapter are difficult to fulfil due to the preclinical-clinical structure of the course, and the nature of the preclinical course which is delivered to veterinary and medical students by staff from a number of preclinical Departments in Years 1 and 2, and from a wide range of preclinical and other Departments in Year 3. The numbers quoted in Tables 10.1, 10.2 and 10.3 together with ratios, information, comments and suggestions relate specifically to the academic and support staff of the Department, but can be taken generally to cover the pre-clinical years of the veterinary course. Explanatory notes are provided where the requirements do not fit the Cambridge model.

Figures provided are as at 1 October 2014, and known staff changes at that date have been included. Further changes may occur before the Visitation.

Table 10.1 Personnel in the establishment

	Budgeted posts (FTE)		Non-budgeted posts (FTE)		Total (FTE)
	VS	NVS	VS	NVS	
<b>1. Academic staff</b>					
A Teaching staff	23.35		2		25.35
B Research staff	6	12.8		41.1	59.9
c Associate Lecturers			5*		5
c Principal Clinicians			1		1
c Clinical veterinarians	7		2.5		9.5
c First opinion veterinarians	1		2		3
d Total academic staff	37.35	12.8	12.5	41.1	89.7
<b>2. Support staff</b>					
e responsible for the care and treatment of animals	20.68		14.7		35.38
f responsible for the preparation of practical and clinical teaching	0.5**				0.5
g responsible for administration, general services, maintenance, etc.	22.74		6.6		29.34
h engaged in research work			14		14
i others (please specify)					
j Total support staff	43.92		35.3		79.22
<b>3. Total staff (d + j)</b>					168.92

\* non-salaried

\*\* this refers to the staff member supporting the Teaching Laboratory; other support for clinical teaching is drawn from categories e and g.

Table 10.2 Allocation of personnel to the various departments

Name of Department	Academic staff				Other	Support staff		
	Full	Assoc. Prof., Reader or Senior Lecturer	Assist. Prof., Lecturer	Assis-tant		Technical/animal		Admin/general
						Teaching	Research	
Pathology	2VS	2VS	1VS			5.93		1
Small animal	1.5VS	5.5VS	0.6VS			16.09		
Farm animal	0.5VS	1VS		1.5VS		1		
Equine	0.5VS	3VS		1VS	3VS	6.36		
Anaesthesia		1VS		3VS		1		
Diagnostic imaging	0.5VS			1VS		4		
Parasitology		1VS				0.25		
Public Health		1VS		1VS				
Animal Production		1VS 1NVS	1VS					
Microbiology	1NVS	3NVS					1	
Epidemiology		0.8NVS	1NVS					
Hospital admin								9.36
General admin and services						0.25	7.5	21.92

**Notes**

These figures are for the clinical course in Years 4 - 6.

Table 10.3 Ratios

	Indicator (Ratios)	Denominator
R1:	$\frac{\text{no. total academic FTE in veterinary training}}{\text{no. undergraduate veterinary students}} = \frac{78.61}{394} = \frac{1}{5.01}$	5.01
R2:	$\frac{\text{no. FTE total Faculty}}{\text{no. undergraduate students at Faculty}} = \frac{168.31}{192} = \frac{1}{1.14}$	1.14
R3:	$\frac{\text{no. VS FTE in veterinary training}}{\text{no. undergraduate veterinary students}} = \frac{41.71}{394} = \frac{1}{9.45}$	9.45
R4:	$\frac{\text{no. VS FTE in veterinary training}}{\text{no. students graduating annually}} = \frac{41.71}{71} = \frac{1}{1.70}$	1.70
R5:	$\frac{\text{no. total FTE academic staff in veterinary training}}{\text{no. total FTE support staff in veterinary training}} = \frac{65.01}{65.14} = \frac{1}{1.00}$	1.00

### Notes

R1: The figure of 5.01 is below the RCVS established range of 8.85-10.42 – but means that there are fewer students/academic fte than the RCVS established range. This is a reflection of the relatively small student cohort at Cambridge veterinary school.

R2: The figure of 1.14 is well below the RCVS established range of 8.75-12.54. This probably reflects that “Faculty” here has been taken as Faculty of Veterinary Medicine. It does not include staff in the Faculty of Biology which has many departments that are not involved in teaching the veterinary students and whose department have a large research staff base.

R3: The figure of 9.45 is below the RCVS established range of 10-62-12.62. This means there are fewer veterinary students per veterinary surgeon fte – a reflection of the small student cohort size at Cambridge veterinary school.

R4: The figure of 1.71 is below the RCVS established range of 4.91-7.21. This probably reflects the small student cohort size at Cambridge veterinary school (although 71 was a relatively large cohort for Cambridge).

R5: The figure of 1.00 is within the RCVS established range of 0.53-2.20 and has been calculated for the Faculty/Department of Veterinary Medicine.

## **Allocation of staff to the Faculty**

The allocation of staff to the Department and pre-clinical Departments is determined by negotiation with the School of the Biological Sciences in line with the general allocation of public funds described in Chapter 3 above. Additional staff can be employed, with the agreement of the University, from Hospital or other funds available to the Department.

## **Allocation of staff to the units within the Faculty**

Allocation of academic staff within the Department is based on teaching, research and clinical service, and is decided by the Head of Department in consultation with the Strategy & Executive Committee. The allocation of support staff in a non-hospital context is similarly decided. In the case of clinical and support staff appointments in the Hospital, decision-making is devolved to the Hospital Management Committee, taking into account the need to support teaching and clinical service work.

## **Difficulties in recruiting or retaining staff**

It is difficult to recruit and retain veterinary surgeons in many clinical disciplines, including equine surgery, farm animal studies, small animal surgery, neurology, oncology and clinical pathology. The reasons are, firstly, the shortage of available specialists in certain areas such as clinical pathology and, secondly, the higher salaries that can be commanded in specialist referral practice and industry. In addition to this, some other UK veterinary schools offer financial incentives in the form of market supplements or salary enhancements, which Cambridge does not currently do.

## **Trends or changes in staff levels or the ability to fill vacancies over the past decade**

The Department has had difficulty in filling posts in all the areas mentioned in the paragraph above over the past decade. This can be addressed by an expansion of clinical training posts in these specialties, but this in itself is limited by the need to have enough specialists to supervise the training, and the majority of trainees choose to move into private practice upon completion of training rather than remain in the employment of the University.

## **Employment of additional staff from service income**

The University permits the funding of additional posts from service income, but this is contingent on being able to service the commitment from regular clinical or other income. The pressure on academic staff to perform to a high level across teaching, clinical service, research and administration is a challenge. We have addressed this to some degree by the establishment of a number of service / teaching posts in the Hospital funded from service income, with the aim of relieving some of the pressure on research-active staff.

## **Regulations governing outside work, including consultation and private practice, by staff working at the establishment**

Academic freedom does allow academic staff to undertake consultancies and some private practice as long as this does not impinge on their Departmental duties.

In the case of Hospital clinical appointments there is a contractual restriction that requires privately generated clinical income to be paid into a Departmental account and used to support Departmental work or research

Non-academic staff are contractually debarred from undertaking paid work during Departmental work time.

## **Scientific meetings and sabbatical leave**

Every effort is made to enable staff to attend scientific meetings and a variety of funds are available to subsidise attendance, particularly from research grants, but not always to pay the full costs. Academic staff are required during term time to apply to the Head of Department for leave of absence for any period exceeding 48 hours.

The central University Travel Fund to support attendance at conferences and meetings was discontinued in 2012. Non-clinical academic staff can apply to a small fund in the School of the Biological Sciences to defray any costs.

In the case of Hospital academic clinicians and other clinical staff, there is an entitlement to up to £1000 per year payable from the Hospital's income.

Entitlement to sabbatical leave is restricted to Professors, Readers, Senior Lecturers and Lecturers. Eligible staff earn one term's sabbatical leave for every six terms worked and the leave may be taken for periods of up to a maximum of three terms. Sabbatical leave is normally granted on full stipend and may not unreasonably be refused. Permission must be sought from the University and the staff member concerned is required to discuss with the Director of Teaching and to make suitable alternative arrangements for the performance of his/her teaching duties. The University normally grants limited additional funds to cover the hourly costs of substitute didactic (lecture-based) teaching.

## **10.2 Comments**

Numbers of personnel in the various categories are often one deep, and whilst we consider that staff numbers are generally adequate to cover the teaching, there can be considerable difficulty across the Department in providing temporary cover for sabbatical leave, sickness, maternity leave, paternity leave, and internal secondment, the funding for which has to be found from the Department's own resources (although central funding may be available in certain limited circumstances).

The Department follows good practice in its recruitment procedures but these can be slow and there are gaps between employees leaving positions and new appointments being made. This leads to a difficult working environment for those who provide cover in all these instances.

The number of part-time staff in the Department has grown since 2008, and part-time staff number comprise over one third of employees, and this has resulted in additional administrative work.

Salary levels of clinical staff are generally lower than those in the private sector, and this is particularly marked in some disciplines such as equine surgery, small animal surgery, clinical pathology and pathology.

It is difficult to recruit in certain clinical areas. The introduction of revised criteria in the academic promotion system within the University has aided retention of academic staff, but there is still an issue in areas such as clinical pathology, where industrial salaries are very high, and also in some clinical specialities. The salaries for non-academic clinicians are not competitive, and retention is therefore an issue. It is disappointing that the Department trains people in particular disciplines only to see them subsequently leave academia for more lucrative employment in the private sector.

In the case of non-academic staff, recruitment is generally easier, as the University is considered locally to be a good employer providing a secure career structure. One exception to this is the recruitment of veterinary nurses, where turnover is high and recruitment can be difficult.

We are happy with the balance of veterinary and non-veterinary academic staff, which provides a stimulating and productive range of experience and expertise both in terms of teaching and also in terms of generating research activity in the Department.

The Department has signed up to the Athena SWAN Charter, which aims to promote and support the careers of women in scientific disciplines. The Department gained an Athena SWAN Bronze award in 2013, and is working towards submission for a Silver Award in 2016. The initiatives being undertaken in the Department as part of its Athena SWAN engagement have been helpful in promoting the careers of female members (including students) and has moved more broadly into the areas of equality and diversity, which benefit all employees. The Athena SWAN initiative has no dedicated administrative support and we struggle to sustain it. Similarly, introduction of a new QA programme is likely to require new support staff resource that the Department does not have.

We are about to advertise a position of Clinical Skills Centre Facilitator to manage the day-to-day activities of the Clinical Skills Centre. We have three years of funding to support this position, but no funding thereafter to support this vital new area of the Department's teaching provision.

IT support has been outsourced internally within the University. The staff who work in the Department are not included in the figures in the tables above, but provide an excellent service and presence. We do not have sufficient recurrent funding to sustain the level of support that we currently have and need.

### 10.3 Suggestions

The introduction of clinical supplements (in the form of market supplements or a percentage uplift on salary) for clinically active members of staff might alleviate some of the problems experienced in recruitment and retention.

Out-of-hours payment for emergency clinical service work is currently paid as a non-pensionable payment; this element of remuneration for qualified veterinary surgeons would be more attractive if paid as a pensionable payment.

The introduction of a salary uplift for clinicians employed by the Department upon gaining a Diploma in their specialty would enhance retention of highly qualified staff.

The Department is actively pursuing these suggestions within the University.

The Department suffers from a lack of technical and administrative staffing to support its teaching effort. Specifically, it requires a new position to underpin Human Resources and the Athena SWAN initiative; recurrent funding for the position of Clinical Skills Centre Facilitator; and a position to manage quality assurance in the Tutorial Office. It also requires recurrent funding to pay for its outsourced IT support.

# CHAPTER 11

## CONTINUING EDUCATION

### 11.1 Factual information

Most members of the clinical department are actively involved in CPD provision for external providers. This includes contributing to modular courses such as those provided by the BSAVA and Improve International for Postgraduate Certificates, participating in webinars such as for WebinarVet, and providing lectures for regional meetings as well as national and international conferences.

The Department runs a limited number of Continuing Professional Development (CPD) courses for veterinary practitioners, which focus on areas not covered by other CPD providers. These include courses such as the Clinical Research Outreach Programme as well as those with a more practical component such as the Advanced Small Animal Medicine Course and the Radiology Film Reading, which have been running for over 30 years. The courses organised in the Department during the last year are listed in Table 11.1.1.

The Department also hosts between 70 – 80 visiting veterinary surgeons each year. Each veterinary surgeon either makes an arrangement with or is assigned to a host member of staff to attend a particular service for a specified length of time. Each application is reviewed and approved by the Hospital Management Committee before arrival. External applicants include residents gaining additional or specialist experience as well as veterinary surgeons from practice gaining an intensive period of practical training in a specific area. Each visitor joins one of the clinical disciplines for a period of usually one to three weeks. These visitors are always very grateful for the opportunity we provide and appreciate the excellent opportunity for gaining intensive clinical experience at tertiary referral level.

### **Journal Clubs**

Most disciplines in the Hospital run their own Journal clubs on a regular basis. These Journal clubs are open to all and form an important part of the residency-training programmes. They also provide professional development for the senior members of staff and helps them kept abreast of the latest scientific papers as well as ensuring that a systematic and balanced critique of the papers under scrutiny is performed.

A new innovation has been the establishment of a Veterinary Education Journal Club. This has proved very popular with clinical staff and the attendance has grown quickly to around 20 per session. Topics covered have included clinical reasoning, giving feedback and the flipped classroom. The papers are posted on CamTools for those attending as well as for reference for those who are unable to attend the session.

Table 11.1: Courses organised by the establishment in 2014

Title of course	Number of participants	Total number of hours of the course
Advanced Course in Small Animal Medicine (July 2014)*	30	35
Radiology Film Reading, 2013-2014	10-15	40
Small Animal Medicine and Surgery CPD Marathon*	50	10
Small Animal Medicine CPD Fiesta*	80 - 90	8
Fundamentals of Veterinary Science Summer School	12 - 15	450 contact hours / student
Tea Club Talks	30 - 60	Fortnightly during term
Research Seminar (Friday morning seminar)	30	Weekly during term
Animal Welfare Seminars	8 -16	Weekly during term
Cambridge University Veterinary Society Talks	50 (students and staff)	Weekly during term
Clinical Research Outreach Programme (CROP)	25	100 hrs / student
Joint BEVA meeting in Equine Lameness	20-40	16
Farm Practice Meeting	30 - 40	Quarterly
Animal Welfare Course	24	72

\* Courses organised by East of England CPD (Dr Mark Reading)

## Academic Staff Development

The University organizes a comprehensive programme of courses for Academic Staff Development on many aspects of teaching, research and administration that are common to several disciplines. Teaching staff are encouraged to attend these sessions, some of which are designed to meet the specific needs of newly appointed staff, whilst others aim to assist staff to develop their full potential in teaching and

leadership.

The Department introduced Staff Training Days in 2010 and these occur at least annually. Each of these training days focuses on an aspect of current interest/concern. The subject areas covered to date have been:

- 2009-10: principles of assessment, essay questions, multiple choice questions
- 2010-11: short answer questions, continuous assessment
- 2011-12: lectures and presentations, handouts and other teaching material, peer review
- 2012-13: final year rotation assessment, communication skills teaching
- 2013-14: communication skills teaching and assessment
- 2014-15: multiple choice questions, writing good questions with effective distractors, item analysis and evaluation discriminatory power of questions

A summary of these sessions is made available to all staff via CamTools and/or the Teaching Guide.

### **Induction Programme for new lecturers**

The University organizes a series of seminars on effective teaching delivery and assessment methods. New lecturers are strongly recommended to attend these sessions during their probationary period.

### **University Seminars**

There are a considerable number of seminar series organized by other cognate Departments that are regularly attended by members of the preclinical and clinical staff at the University.

### **11.2 Comments**

The University of Cambridge is focussed on research and although promotion within the University can be gained through excellence in teaching, little credit is given to the provision of CPD. For this reason the Department cannot justify the resource to support a CPD unit to facilitate and organise more CPD sessions within the Department occurs in other Veterinary Schools. However the quantity and quality of the CPD provision by members of the Department is recognised nationally and internationally

### **11.3 Suggestions**

It is not clear why this section on the provision of CPD by the Department is included in the SER. The provision of CPD via webinars, for example, means that the physical place where the CPD is delivered is fairly irrelevant. Similarly we fail to see why CPD provision within the Department should be treated differently from CPD provision outside the Department. The evidence of personal CPD, of course, should be available from the RCVS Professional Development Record.

## CHAPTER 12

### POSTGRADUATE EDUCATION

#### 12.1 Factual information

##### 12.1.1 Clinical speciality training

The Department runs programmes for Junior Clinical Training Scholars (1-year positions; “internships”) and Senior Clinical Training Scholars (3-year training position; “residencies”).

Table 12.1.1 Clinical Speciality training

Clinical Discipline (Note)	Duration of training	Number enrolled		Diploma or title anticipated
		Senior Clinical Training Scholar (SCTS)*	Junior Clinical Training Scholar (JCTS)	
1. SA Surgery	3 years	3		Dip ECVS
2. SA Internal Medicine	3 years	3		Dip ECVIM
3. Anaesthesia	3 years	3		Dip ECVAA
4. Diagnostic Imaging	3 years	2		Dip ECDVI
5. Anatomic Pathology	3 years	2		Dip ECVCP, FRCPPath
6. Neurology	3 years	1		Dip ECVN
7. Pig Health Management	3 years	1		Dip PHM
8. Clinical Pathology	3 years	2		Dip ECVCP, FRCPPath
9. Oncology	3 years	1 (plus one part-time)		Dip ECVIM-Oncol
10. Cross species / Disciplines	1 year		11**	

\* All those studying for a European Diploma are on training programmes approved by the relevant European Specialty College.

\*\* Junior Clinical Training Scholars (JCTSs) are not registered on an external training programme, but undertake a rotational training devised by the Department and under the direction of the JCTS Co-ordinator. Many JCTSs will subsequently go on to join an SCTS programme in the Department or elsewhere. Of the 11 JCTSs, 7 are in small animal studies, 2 in equine studies and 2 in farm animal studies.

All these training posts are funded by Scholarships. Published handbooks outline the SCTS and JCTS programmes. The SCTS programme includes a short research project for which a defined budget is given.

### 12.1.2 Research Education programmes

The Department does not provide taught postgraduate degree courses.

The graduate degrees available in the Department are Master of Philosophy (MPhil), Doctor of Philosophy (PhD) and Doctor of Veterinary Medicine (PhD). The number of postgraduate students in these degree programmes is given in Table 12.1.2.

Table 12.1.2 Number of research students enrolled in different programmes

a). Masters Level	Duration of Training	Number enrolled	
		Full time	Part time
MPhil (Vet Sci) in the Department of Veterinary Medicine	12 months	2	Nil
b) PhD Level	Duration of Training	Number enrolled	
		Full time	Part time
PhD (Vet Sci) in the Department of Veterinary Medicine	36 months or 48 months	34 (19F, 15M)	Nil
Percentage of PhD students holding a veterinary degree: 47%			
c) Other doctoral level Degree and discipline	Duration of Training	Number enrolled = 3	
		Full time	Part time
Vet MD	Up to 6 years	see note 3, below	see note 3, below

#### Notes

1. For both (a) and (b) students must be grant supported.
2. For (c) students are self-funded.
3. Programme (c) is designed for Cambridge graduates who are veterinarians in clinical practice. There are currently 3 students enrolled on this programme.

One to two Cambridge VetMB graduates enter programme (b) per year. Roughly similar numbers take up postgraduate research training elsewhere (total is <10% of student cohorts). Cambridge VetMB graduates do not usually enter programme (a).

Most four-year PhD students are part of programmes of a 1 year + 3 year format where the PhD project itself lasts 3 years.

## **Funding**

The majority of graduate research students are funded externally through Doctoral partnership programmes with the BBSRC and the MRC (each supplemented by some University Trust funding), specialised Doctoral Programmes of the Wellcome Trust, through an exchange programme with the National Institutes of Health, or internally through the Gates Scholarship Foundation, the Cambridge University Overseas Trust and the Cambridge Home and EU Scholarships. Individual students are also funded from a variety of UK and overseas sources. Funding for travel, conferences etc. comes both from grants and from University and college sources.

Student management has several components that are specified in a Code of Practice for Postgraduate Degrees at the University of Cambridge. All students have an appointed primary supervisor and either a single further advisor in a research Department or a supervisory team.

The student is expected to have formal meetings with their supervisor on a regular basis and with the advisor or team at least twice per term. The supervisor reports on progress to the Department and college once per term through a web based reporting tool, and these reports are also available to the student. Graduate educational matters, problematic student cases, ranking of students for scholarships and the like are dealt with through a Departmental Graduate Committee, chaired by the Director of Graduate Education, who also acts as an independent ear for student problems.

In addition, all postgraduate students on a degree programme are required to be a member of a College; that College provides further pastoral support through the student's College Tutor and seminars that their College might provide. Thus the student is also supported by a College graduate Tutor, whose role is to deal with welfare problems, and to act as an advocate for the student in any dispute with University or course managers.

All the research postgraduate students are required to undergo transferable skills training, which is provided partly at Departmental level and partly centrally through the Graduate School of Life Sciences.

In addition to the above, a number of short courses or projects providing research education are open to those studying at different levels. These include:

- Summer research projects for undergraduate students (mainly vets but including others in the life sciences);
- Research projects for SCTSs, often combining clinical and laboratory work;
- Research lab rotation projects for Master of Research (MRes) students taking part in a BBSRC Doctoral Training Partnership in 1 year + 3 year format. The MRes degrees are awarded by the School of Biological Sciences. Some of these students then take PhD Degrees registered through the Department of Veterinary Medicine.
- The Clinical Research Outreach Programme ("CROP course"). This provides a foundation in clinical research methods and is open both to veterinarians in

practice, but also to those undertaking postgraduate clinical training and postgraduate research students who need to look at clinical research methodology and project design.

## 12.2 Comments

Around 90% of PhD students obtain the relevant qualification within their 36/48-month training period. For SCTSs, virtually 100% obtain their European Diplomate status either by the end of their training programme or shortly thereafter; exact timing can depend on when the European Board Examinations are held and the SCTS's programme dates.

The number of trainees is governed both by the funding opportunities available from within the Department and externally, and by the capacity of the senior staff to manage adequately the training of SCTSs. Departmental policy is not to take more SCTSs than the Department can adequately train.

The proportion of our veterinary undergraduates who go on to postgraduate research training immediately after qualification is about 5%. Another 2% may return to research training programmes after a period in practice or as a SCTS in the Department or elsewhere. The current trend in the VetMB students is a small increase in the number of undergraduates interested in a research career, as evidenced by the interest in the Cornell Leadership programme and other research placements during EMS.

Three factors that limit the attractiveness of a research career are: the perception of poor career structure and prospects, the lack of sufficient funded opportunities for PhD places and the perception of veterinary graduate CVs (e.g. level of research laboratory experience on their undergraduate course) amongst funding panels dominated by non-veterinarians. Summer schools have proved fertile in recruiting veterinary students into research degrees, with roughly one third of those going through the Fundamentals of Veterinary Science programme entering these careers. Unfortunately, this programme has always had more appeal to non-UK students, and Wellcome Trust funding for this programme has now ceased.

The first career destination for most of our non-clinically qualified students remains postdoctoral work while a proportion of clinical students go into higher clinical training or return to other forms of practice. Later career destination are harder to track, but include academic posts, clinical trials management, Named Veterinary Surgeon posts under the Animals (Scientific Procedures) Act, 1986, private specialist referral practice, etc.

The Department has a number of major research areas and many projects are cross-disciplinary with the University of Cambridge. Collaborative studies expose students to other Departments and Institutes both within the University and outside it. Examples include the Wellcome Trust Sanger Institute, the Cambridge Laboratory of Regenerative Medicine, Departments within the School of Biology, Department of Physics and several departments in the School of Clinical Medicine.

One challenge for any veterinary student embarking on a research career is the length of training involved. This is now further complicated for English students by

student debt and has already had a perceptible effect on numbers of UK vets applying to do research.

The recent trend towards large-scale (pan-University or multiple institution) programmes has presented a further series of obstacles to the recruitment of veterinary-qualified students into research programmes within the Department.

In the past, specialist funding for veterinary research training from The Wellcome Trust, and the Department-directed BBSRC PhD studentship programme allowed us to address the problem of recruiting UK students. The loss of earmarked funding for UK students currently poses real problems for UK veterinary research, and particularly for educating clinically qualified researchers at PhD level.

However, the advent of large scale programmes does allow the department the potential opportunity to attract bioscience students who might not otherwise have thought of a PhD within a veterinary school – although at the same time it has provided competition to the Department in retaining its own students and progressing them into a research career.

The change to an increasing proportion of four-year PhD programmes is to be welcomed in that it provides an opportunity to give PhD students a wider training and to allow them to consider a wider range of career choices after obtaining their degree. However, this does increase costs per student markedly and has thus reduced the numbers of studentships to which the Department has access. In particular the trend to within-University but non-local management of PhD funds has made it more difficult to maintain differential stipends for those with clinical qualifications. There is a real and very pressing need for consistent and ongoing funding for veterinary research training.

The addition of subject based opportunities, specifically in food security, by the BBSRC has helped to provide opportunities in large animal research, but companion animal research is still comparatively difficult to fund with PhD studentships. Nevertheless, there is at least one veterinary-based PhD student working on a canine project at the School of Clinical Medicine, bringing issues of companion animal disease into the forefront of medical-based research. There is much goodwill to develop further collaborations between the Department and the Clinical School.

Difficulties have been noted for supervisors in retaining students who apply at the start of a four-year programme to work with them after the first year of rotating laboratory placements, although some programmes in Cambridge are now addressing this.

The Department benefits from the “Part II” Honours courses taken by the large majority of its undergraduates, which equip them well for research careers and gives them an advantage in the competition for PhD studentships. One student has been granted permission to intercalate her PhD in between years 3 and 4 of the VetMB course (similar opportunities are available to medical students in their course); the degree of disruption this may cause to her veterinary studies will be evaluated in due course. However it is clear that some veterinary students starting their PhD studies (and particularly those trained overseas) require quite a lot of subject-directed training; the preliminary year (in the 1 year + 3 year programmes) is very valuable in this respect.

### 12.3 Suggestions

The VetMD degree has received little uptake in recent years. Currently we are making changes to bring its structure more into line with PhD degrees and to give supervisors the same responsibilities to their students that they undertake when supervising PhDs. The VetMD degree programme will then be re-launched and it is anticipated that the improvements in structured supervisory support will increase its attractiveness.

## CHAPTER 13

### RESEARCH

#### 13.1 Factual information

Student opportunities to perform research (defined as laboratory, clinic or field-based experimental work, or novel analysis of data supplied by others, or novel retrospective meta-analysis) are tabulated below.

Year of Course	Name of Course component	Research Hours	% Students involved	Outcome required
3	Natural Science Tripos (NST) Part II	300-400 timetabled, plus own time (subject dependent)	Approx. 65% of students take a year 3 option with a research project; the remainder undertake a research dissertation	Project Presentation 15-20 mins and Project Report: 15 - 25% of NST Part II Year mark, subject dependent
4	Final Vet MB Assignments: VPH assignment (Bristol abattoir placement) – one essay relevant to the role of OV and two reports relating to abattoir specimens	Own time during placement	100%	Assessed by written work. Pass required to proceed to Final Vet MB Part II exam
6	Final Vet MB Part III elective	8 weeks full time	100%	Dissertation: Presentation: Certificate of diligent attendance  Pass required for award of Vet MB

#### 13.2 Comments

##### **1<sup>st</sup> and 2<sup>nd</sup> Year research opportunities**

Students have many opportunities to develop elements of the research skills base, including analytical, synthetic and presentational skills. This starts with the use of problem-based learning approaches in the Medical and Veterinary Sciences Tripos

(MVST) Parts IA and 1B (Years 1 and 2 of the course) in which students learn library and web skills in researching a component of the course, which they then present to their peers. This type of synthetic and presentational work occurs in all subsequent years of the course.

### **3<sup>rd</sup> Year research opportunities**

In Year 3, about 65% of students take the opportunity to study single-subject basic science at Honours level by joining the Natural Science Tripos (NST) courses. These courses have a laboratory-based research project as a major component. Veterinary, medical, and basic science students undertake projects in the Department as part of these Tripos subjects. Similarly, some veterinary students undertake project work in basic science or (human) clinical medicine departments. All are supervised by academic staff with significant research experience and expertise, including, in most instances, individuals who are at the international forefront of their fields. Most of the students who do not do a single subject laboratory-based project in Year 3 undertake broader science-based courses (the NST Biological and Biomedical Sciences Part II option) to compile a dissertation, which usually involves novel analysis.

### **6<sup>th</sup> Year research opportunities**

All students are required to undertake a clinical-based project as part of their elective in Year 6. The project is assessed by written and oral presentations and a statement from the supervisor on the manner in which the project was conducted. This assessment contributes to the overall marks in the VetMB Final Examination Part III. The electives in Year 6 can involve laboratory or clinic based research projects, but can also involve the production of a novel teaching CD-ROM, or a similar synthetic review. The majority (>90%) of projects are practical, clinically-based investigations. The outputs of elective research projects often contribute to presentations at BSAVA or similar meetings.

### **Summer Vacation Studentships**

Summer Vacation Studentships provided by Biotechnology and Biological Sciences Research Council (BBSRC) are advertised to Departmental staff and students. Wellcome Trust-funded studentships are also available and applications from students who express a desire to undertake a summer research project are supported by their potential supervisor in the application process. Up to 6 weeks of the research project may be counted as EMS. However, students in 4<sup>th</sup>-6<sup>th</sup> years tend to focus on obtaining clinical EMS in practice; as a result most students undertaking summer vacation projects do so at the end of their 3<sup>rd</sup> year (after their MVST Part II). Students in their clinical years that express a desire to undertake a summer research project have, in recent years, been directed to the Summer School.

### **Summer School for prospective veterinary-qualified research students**

Up to 2013, Cambridge hosted the 9-week Summer School, 'Fundamentals of Veterinary Science', funded by the Wellcome Trust. This had the express objective of allowing veterinary students to consider research careers. It placed veterinary students from clinical years in a world-class laboratory to perform a research project.

It also ran career discussions and analyses of important veterinary problems such as TSEs or bovine TB, introducing the student to internationally renowned academic staff who specialise in these problems. Students were recruited from the UK, the USA and all parts of Europe. For UK students, up to 6 weeks of the Summer School may be counted as EMS. The Wellcome Trust funding ceased at the end of 2013.

### **Cornell Leadership Programme**

In the last few years an increasing number of our students have chosen to spend a part of their vacation attending the Leadership Programme for Veterinary Students at Cornell University in the USA. We actively encourage application to this prestigious, selective programme, which is designed to prepare young veterinarians for academic and research careers. An average of 1 student per year has attended this course since the last Visitation. These students normally attend at the end of their 4<sup>th</sup> year.

In addition to this, increasing numbers of students are now spending part of their EMS time in research laboratories both in the UK and overseas.

### **Research Mentoring**

Students who wish to obtain further research training following graduation, for example in the form of higher research degrees, are given guidance regarding opportunities and strategy. The Departmental Director of Research takes primary responsibility for this function, but advice may also be provided by project supervisors, clinical Directors of Study or VSCSs.

### **Veterinary Leadership Training (RVC)**

This new course is currently under evaluation by the Director of Teaching. Opportunities for students to attend that course would be dependent on them securing the required funding.

### **Overall comments**

The University of Cambridge is the leading research university in Europe, according to most published studies, and this is reflected in its strong research ethos. Students at Cambridge therefore have significant and excellent opportunities to perform research, and are strongly encouraged to do so. All students have some substantial periods of the timetable specifically allocated to research and therefore receive a minimum level of research exposure and training.

This will be strengthened by the introduction of a short research-based assessment in 4<sup>th</sup> Year, linked to the Integrated Animal Management course and examined by written and oral presentations. This assignment has been allotted 10 hours of timetabled time, plus self-directed study in the students' own time. Students must pass the assignment (assessment criteria and descriptors have been finalised) before then can take the Final VetMB Examinations Part II. This has been agreed by the Teaching Strategy Committee, for introduction by the 2016-17 academic year.

We are satisfied that the provision of research opportunities is adequate, given the other demands of the veterinary timetable, but we also actively encourage and support students who show an aptitude for and interest in research. The Academic

Support Officer keeps a file of grant opportunities for those students wishing to obtain funding for vacation research work.

### 13.3 Suggestions

We have no suggestions

# CHAPTER 14

## EXTRA MURAL STUDIES

### 14.1 Factual information

#### **Preclinical EMS**

##### Objectives and desired outcomes

The objective of preclinical EMS is to provide students with practical experience of working with farm animals, horses, and other commercial enterprises involving the husbandry of animals. On completion of preclinical EMS, students should be able to perform a range of husbandry tasks with a basic competency, with due regard to their own safety, the safety of colleagues, and the welfare of animals in their care.

##### Requirements

In order to complete the pre-clinical EMS requirements, students must complete a minimum of 12 weeks work, 8 of them on farms in the UK, to include:

- At least 2 weeks working with cattle (dairy, beef or calf rearing);
- At least 2 weeks working with sheep (preferably to include lambing);
- At least 2 weeks working with pigs (preferably with at least 50 breeding sows);
- At least 2 weeks working with horses;
  - At least 2 weeks working with dogs/cats in a boarding kennels/cattery or similar establishment
  - At least 2 other weeks working with either the above or other animals (e.g. poultry farms, laboratory animals, wildlife sanctuary, zoological collections in UK, farms abroad, etc.)

These 12 weeks of work on farms or other animal management-related establishments must be approved by the Tutorial Office, Veterinary School Clinical Supervisor (VSCS) and pre-clinical EMS Coordinator. These elements ensure that pre-clinical EMS achieves its goals of providing students with practical experience of animal management, husbandry and handling of farm animals while retaining a reasonable degree of flexibility for gaining experience with the practical management of other non-farm species.

Students have an introductory lecture on pre-clinical EMS as part of the Principles of Animal Management course and are supplied with a booklet 'A guide to Extramural Studies for Preclinical Veterinary Students' that stipulates the requirements and gives suggestions for what students should seek to achieve on their placements.

The Tutorial Office maintains a database of around 350 preclinical EMS placements that have been approved and which fulfil our required health and safety and insurance conditions. Any new placement suggested by the students is contacted

prior to the placement and sent paperwork explaining these conditions and the aims and objectives of preclinical EMS. The placement then sends back their details and signed agreement that such conditions are in place, and if they have given their permission for their contact information to be given to all students, they are then added to the preclinical EMS database.

Students are required to complete a risk assessment form for any preclinical EMS placements abroad or any placements in zoos or safari parks within the UK. This is discussed with their VSCS who provides feedback and approval before submission to the Tutorial Office.

Students and their preclinical VSCS meet termly to discuss placements, placement reports and progress with preclinical EMS. Attendance at these meetings is required to be certified and students are required to show evidence of attendance at these meetings before progression to the fourth year.

### Time Requirements and Certification

Preclinical EMS is only valid if conducted from the Christmas vacation of the 1<sup>st</sup> Year (i.e. after the student is matriculated) and must be completed before entry to the 4<sup>th</sup> Year of the course. In exceptional circumstances, allowances may be made for preclinical EMS completed before starting the course but only at the discretion of the Faculty Board of Veterinary Medicine. The minimum period advised for placements at preclinical EMS establishment is 2 consecutive weeks and attendance at each period of preclinical EMS must be certified either by the manager of the establishment, or the student's supervisor. Attendance certificates require confirmation of diligent attendance and satisfactory performance. A specific member of staff acts as EMS Coordinator for the preclinical EMS.

Students must attend a compulsory Health and Safety lecture (related to farm and animal hazards) and complete a Pre-Clinical EMS "driving licence" before embarking on allowable pre-clinical EMS.

### Assessment

Students are required to submit a brief report (approx. 500 words) on each of their preclinical EMS placements; a template report form is provided to the students. The report is submitted to, assessed and approved (unless inappropriate to approve) by the student's VSCS and is then forwarded to the Tutorial Office that maintains a record for each student. The EMS Coordinator for preclinical EMS monitors these reports. The student cohorts that will graduate in 2019 and 2020 are trialling the new RCVS on-line student experience log.

### **Clinical EMS**

Resources to support students in undertaking Clinical EMS:

The EMS Coordinator, with administrative help from the Academic Support Officer and Senior Secretary (Academic Support), maintains an electronic database of

around 930 veterinary practices (including charity clinics) that accept Cambridge students. All practices entered on the database are sent a set of guidance notes on the Cambridge EMS scheme. Databases of meat plants and Animal and Plant Health Agency (formerly Animal Health Veterinary Laboratory Agency) Laboratories, drawn from official sources, are also available. Students also have access to the RCVS Directory of Practices. Uniquely among UK veterinary schools, the Department provides travel and maintenance grants to assist students in EMS. All students are issued with a clinical EMS guidance booklet, which contains the necessary regulations and forms. They are also provided with a Clinical Skills Checklist ('black book') which contains forms to record the compulsory experience required, and a clinical skills checklist to enable them to monitor their acquisition of day one competences, thereby acting as the basis of a personal development portfolio. Students entering the clinical course from October 2013 onwards have been enrolled on the RCVS Student Experience Log in which they can record placements, Aims and Objectives, clinical experiences/skills undertaken, etc.

### Clinical EMS requirements

Twenty-six weeks of clinical EMS are required and the Department offers students support in arranging and undertaking a programme of placements in a variety of practice and other veterinary environments suited to their own developmental needs and interests. Clinical EMS may not begin before the Michaelmas Term of the 4<sup>th</sup> year and the minimum of 26 weeks clinical EMS requirement must be completed before entry to the Final Veterinary Exam Part III. Clinical EMS requirements have been revised since the last Visitation in 2008 to take into account the recommendations of the RCVS Policy and Guidance issued in 2009. The aim is to make EMS as flexible as possible while still ensuring that students gain sufficient experience of the main veterinary species and UK practice.

The Department's EMS requirements are that the first 6 weeks of clinical EMS should be in 3 blocks of 2 weeks each of first opinion UK practice in a variety of species ('preparatory EMS'), classified as small animal, farm animal and equine practice. It is hoped that at least one of these practices may become a 'base practice' to which students return during the clinical course.

The remaining 20 weeks can be spent in a variety of veterinary practices and activities in the UK and abroad. In order to ensure RCVS Day 1 Competences, students are required to spend at least 4 weeks in predominantly farm animal practice (including 2 weeks of cattle); 4 weeks in predominantly small animal practice and 4 weeks in equine practice.

Students can include one week at an APHA (formerly AHVLA) regional laboratory (or counterpart in Scotland or Northern Ireland). This is no longer compulsory due to a national shortage of placement opportunities but it is strongly recommended particularly for students interested in a career in large animal practice.

Abattoir work is no longer part of obligatory EMS because a week at the University of Bristol's abattoir facility is now part of intramural teaching. However, students are encouraged to consider further weeks at an abattoir or with the State Veterinary Service as part of EMS.

Conference attendance at certain stipulated conferences can count for up to 5 days of EMS, provided the student can provide evidence of attending lectures. It is stipulated that students include no more than 4 weeks EMS at this veterinary school (which includes elective work). It is also stipulated that students include no more than 6 weeks abroad in the minimum 26 weeks' requirement.

More detailed guidance can be found in the Student and Clinical Supervisor guides (these will be provided as supplementary information in the Visitation base room).

### Preparation for Clinical EMS

An introductory presentation by the EMS Coordinator on clinical EMS is given at the beginning of the Michaelmas Term of 4<sup>th</sup> Year. This is expanded in meetings with individual VSCSs and their students. 4<sup>th</sup> and 5<sup>th</sup> Year students progress through rotations that provide an introduction to practical clinical work, which helps to prepare the students for their EMS.

The Department is fully alive to the need to provide a sound basic preparation for common conditions, and we believe that the complementary experience provided by the Department and other learning resources (the RSPCA, Blue Cross, equine first opinion practice and farm ambulatory service, combined with EMS) achieves this.

### Student Progress in EMS

The individual student's VSCS is responsible for advising on EMS, for instance on reputational requirements, suitable placements, placements abroad, and for suggesting funding opportunities. Students are encouraged to discuss their progress in EMS, the balance of experience obtained, and their future plans for EMS with their VSCS at a compulsory termly individual meeting. Records of each individual student's EMS are retained by the Academic Support Officer and the student concerned and are reviewed by the Veterinary School Clinical Supervisors (VSCS) at their termly meeting with each student. Individual students record their practical experiences in their 'black book' and this is then used as a guide to planning further EMS and reviewing their progress in relation to attaining day one competences.

We have introduced an EMS planning form, which encourages students to consider their aims and objectives for each period of EMS, and also helps discussion with their VSCS. The cohorts due to graduate in 2016 and of 2017 are trialling the new RCVS on-line student experience log

### Assessment of EMS

Assessment of EMS is by means of certificates of attendance and by feedback forms (a) from the EMS placement provider reporting upon the student and (b) from the student reporting on each EMS experience.

The VSCS and EMS coordinator are informed of any negative feedback from practices of students and take appropriate action, which usually involves discussion

the problems encountered with the student. The EMS coordinator will usually also contact the practice.

Records of each individual student's EMS are retained by the Academic Support Officer and the student concerned and are reviewed by the Veterinary School Clinical Supervisors (VSCS) at their termly meeting with each student. Individual students record their practical experiences in their 'black book' and this is then used as a guide to planning further EMS and reviewing their progress in relation to attaining day one competences. The cohort due to graduate in 2016 also trialled the new RCVS on-line student experience log alongside their black books.

### Completion of Requirements

Satisfactory completion of 26 weeks of EMS is a requirement before sitting the Final Vet MB Part III. Certain practical skills have to be certified by members of staff as having been satisfactorily completed (the clinical checklist or "Black Book" system). A record of attendance at compulsory classes is also required in the 'black book'.

### Assessment of EMS Performance

Assessment of EMS is via feedback questionnaires from both the student and the extra-mural teacher following each period of EMS. Student reports on EMS are seen by the VSCS and EMS Coordinator, who convey any significant problems that are identified to the Director of Teaching. There is also an annual questionnaire survey of final year students to assess the overall effectiveness of the EMS programme.

## 14.2 Comments

The feedback information indicates that the system as described serves the needs of the majority of students well. Efforts have been made since the last Visitation to address inequality of preclinical EMS experience by bringing preclinical EMS within the VSCS system so that monitoring of student EMS begins from Year 1 with the same supervisor who will also monitor clinical EMS, bringing a more consistent and holistic approach to the EMS learning experience. Some students still have difficulty finding appropriate preclinical EMS placements, particularly with pigs. To date, we have found them placements with the help of clinical staff. However, this may become more of a problem in the future.

For clinical EMS, most students have good experiences in a wide range of practices that fulfil their needs. However, there is anxiety particularly in the 4<sup>th</sup> year when students feel increasing pressure to book up 'good' practices well in advance because of increasing pressure with other vet students at other schools. This increasing competition for popular placements is an inevitable consequence of increasing veterinary student numbers throughout the UK and we need to think of proactive ways of addressing it.

The introduction of the new 40-week final year gives more flexibility of dates for EMS outside usual vacations but also means that students need to plan their EMS for the last year well ahead.

There is also a small minority of practices that are trying to be selective in the type of student they accept for EMS and some are also considering charging students a fee. This is particularly the case with some farm practices that try to select only students with a strong farm animal interest. If this became widespread, it would obviously threaten our species minima requirement that underpins the necessity to produce a graduate with day 1 skills in all species.

### 14.3 Suggestions

#### Difficulties with finding Pig placements

We should continue to encourage students to inform their VSCS early if they are having trouble finding particular preclinical placements. To date, problems have only been with individual students. However, the EMS Coordinator will continue to monitor the situation. If the problem with individual species placements becomes more frequent, we will discuss potential solutions with our specialist academic staff.

#### Competition for placements

This is a situation that requires close monitoring by the EMS Coordinator and which is a frequent item of discussion by all the UK Veterinary School EMS Coordinators. Certain practices traditionally offer placements to generations of Cambridge students and we need to emphasise to these practices how much we value these relationships.

## **Appendix 1: Learning & teaching quality update, 2013-14**

## Department of Veterinary Medicine: learning & teaching quality update, 2013-14

This form is intended to collect information about learning and teaching-related matters from across the University for consideration by the General Board's Education Committee and to satisfy external requirements for annual monitoring. The Department's last Learning & Teaching Review submission and any previous quality updates provide the baseline against which developments should be compared. Please draw upon local review arrangements to complete the form by summarising your reflections on 2009-10 and plans for 2010-11.

**All undergraduate and postgraduate courses should be considered in the update.**

If you have any queries please contact Madeline McKerchar ([mjm61@cam.ac.uk](mailto:mjm61@cam.ac.uk)).

### Significant changes introduced during 2013-14

Outline of significant changes and, where possible, comments on the effectiveness of these changes. Areas to consider include:

- course provision and content;
- learning and teaching methods;
- assessment methods;
- learning resources;
- student support;
- administration and organisation.

#### Follow up on changes made in 2012-13:

##### Course provision and content:

##### 1. Clinical Pathology course (4<sup>th</sup> year):

This had been moved from 5<sup>th</sup> year to Michaelmas Term of 4<sup>th</sup> year in 2012-13. The aim was to provide students with an improved knowledge base before they started their first Extra-Mural Studies placements.

**- working well**

2. Duplication of teaching: between discipline courses and species courses – this was rationalised and timetabling revised so that complementary material across different courses is delivered at similar point in the curriculum

**- working well**

##### 3. Preparing for the Veterinary Profession course (2<sup>nd</sup> year):

This course was re-focused and to have clearer themes: the structure of the profession, communication skills, professional ethics, veterinary public health.

**- worked better but requires further refinement in 2014-15**

##### 4. Alimentary system course (4<sup>th</sup> year):

This course was expanded to accommodate increased material that had been in BIDDS course; assessment of the course was divided into two exams to reflect this. The course was moved from Easter to Lent Term to allow for this expansion and Respiratory system moved from Lent to Easter Term to compensate in the timetable.

**- the rescheduling of the lectures worked well and integrated well with cattle medicine and sheep medicine courses. Assessment changes worked reasonably well but require further refinement in 2014-15**

#### 5. Orthopaedic pathology course:

This was moved from Michaelmas Term in 5<sup>th</sup> year to Easter Term in 4<sup>th</sup> year to reduce timetable congestion in 5<sup>th</sup> year.

- **improved balance of lecture load; gave 4<sup>th</sup> year students the underlying pathology of bone and joint disease before a major period in which EMS is conducted**

#### **Student Support**

##### 1. Student Resources Centre:

This opened in 2011 and aims to provide student lockers and a rest/relaxation facility on site

- **working well**

##### 2. New Pastoral Support Officer appointed

- **working well**

##### 3. Administration and Organisation

New Director of Teaching following retirement of Mr. A Jefferies. The role of Deputy Director of Teaching (Examinations) was also created

- **a hand-over period smoothed the transition**

#### **New changes during 2013/2014:**

##### 1. Principles of Infectious Diseases course (4<sup>th</sup> year):

The proposal that parasitology teaching be integrated into the PID course (previously parasitology was taught separately from bacteria and viruses) was implemented and assessment was similarly integrated (parasitology was previously over-assessed relative to other aspects of the clinical course). The course aims to introduce principles of veterinary infectious diseases with some material moved from the previous BIDDS and Parasitology courses into systems and species courses in 4<sup>th</sup> and 5<sup>th</sup> year, allowing reinforcement of knowledge and improved contextualisation of content. A new Senior Lecturer in Parasitology has been appointed and restructuring of PID course will be completed in 2014-15.

- **improved integration between different courses in the curriculum but course needs further refinement in 2014-15**

##### 2. Lambing (4<sup>th</sup> year):

This is now at University Farm, Madingley (for the first time following relocation of the flock). The increased distance of the flock from the vet school site required provision of student rest room at the farm and revised working shift patterns

- **worked well; rest room and its facilities (microwave, fridge, kettle) appreciated by students; revised shift patterns worked well with fewer missed teaching sessions**

##### 3. Clinical Skills Centre:

Building work started on a refurbishment programme that will provide better (and more) small animal consultation rooms, allow relocation of the clinical pathology laboratories and provide for a new clinical skills centre. The centre is due to open in autumn 2014.

- **building project on target. The clinical skills centre will provide improved practical and communication skills training for 4<sup>th</sup> and 5<sup>th</sup> years, to better prepare them for 6<sup>th</sup> year (and EMS).**

### **Assessment methods**

1. Exemplar questions with outline answers were made available to students for the VetMB Finals Examinations Part III.

**- appreciated by students**

2. A reduction in the number of Finals Part I exams was proposed, with some subjects combined into a single exam and other exams covering a wider range of subject matter.

**- proposal was approved and Form and Conduct Notices published for 2014-15**

### **Administration and Organisation**

1. Recording and monitoring of EMS:

This continues to be done through Tutorial Office at Department of Veterinary Medicine. This involves recording student proposals for placements, sending advice to Farmers and other placement providers and recording of all preclinical EMS completed. The new RCVS on line Student Experience Log was piloted, running alongside our existing system

**- teething problems with the SER have been communicated to RCVS. The plan is to continue the pilot into 2014-15 and then decide whether to use it as the sole recording method for EMS or to discontinue its use.**

2. Medical and Veterinary Student Progress Panel:

The remit of this Panel redefined and published in Statutes and Ordinances. New Fitness to Practise regulations for veterinary students were also published in Statutes and Ordinances. All students are now placed on the Veterinary Students Register and are required to sign a code of conduct.

**- MVSP working well to support students. FtP procedures align with RCVS guidelines but have not been required.**

### **Learning and teaching methods**

The Staff Training Day (Feb 2014) focussed on communication skills and the Cambridge-Calgary method of conducting a clinical consultation. This method is taught to students but many clinical staff were unaware of this; consistency of approach to teaching these skills has been improved.

### **Assessment methods**

A Form and Conduct Notice was published relating to 4<sup>th</sup> year examinations. In addition to the changes to the Principles of Infectious Diseases and Principles of Clinical Practice exams (see above), in 2014-15, the two, 90-minute Alimentary systems examinations will be combined into a single (longer) examination. The Respiratory system examination will change in format from a theoretical-based MCQ exam to a practical-based MCQ exam.

Further changes to the 5<sup>th</sup> year examinations will be developed during 2014-15 for implementation in 2015-16.

### **Learning resources**

The rolling programme of upgrading computers in the Lee Computer Laboratory continued.

### **Fitness for Practice**

A review was conducted by RCVS who asked for input from the Department. A Departmental view was submitted. The Director of Teaching attended RCVS to give evidence in person. The RCVS then produced their Fitness for Practice requirements. The new FtP procedures at Cambridge (see above) conform to RCVS requirements.

### **Professionalism in medicine and veterinary medicine courses**

A seminar for College Tutors and Directors of Study was held on this topic in September 2013, and also covered the MVSP and FtP. The seminar was well received and will be held annually.

## **Key matters and planned actions**

Summary of the key teaching-related matters considered throughout the year, and actions planned or taken as a result. Sources to consider include:

- ideas raised in staff-student consultative committees, internal student questionnaires etc;
- student data (admissions/classification/first destination data etc where available) to identify trends that might reflect underlying matters;
- findings of any internal reviews;
- feedback from alumni and employers (if available).

External Examiners' reports, recommendations of General Board Learning & Teaching Reviews, findings of the National Student Survey, and the reports and requirements of professional, statutory and regulatory bodies are considered separately, although you may wish to refer to these here too.

### **Follow up on issues from last year:**

The University conducted a Learning and Teaching Review in 2013. The Department's initial response is attached. There are a number of measures to be implemented.

In addition to this:

#### **Course provision and content**

In addition to follow-up on new changes introduced in 2012-13, and new changes introduced in 2013-14, the following have been agreed for introduction for the 2014-15 year.

##### **1. 40-week Final Year**

This will commence in June 2014. The aim is to maximise the resource provided by the Queen's Veterinary School Hospital by spreading clinical rotations over 40 weeks rather than two 10-week terms as at present. Students will not have any more weeks rotations that previously but will undertake some rotations during University vacation periods (and will conduct some EMS during University term time). Group sizes in the small animal rotations will become 3-4 students per group. The 40-week final year will also include a critical care / out-of-hours rotation and so "hut" duty will no longer count towards clinical EMS.

A new Induction Period will be introduced, including the requirement that 5<sup>th</sup> year students attend final year student elective project presentations.

##### **2. Principles of Clinical Practice course (4<sup>th</sup> year):**

Subject matter delivered in Michaelmas Term will be restructured to better prepare students for their first EMS placements (often at Christmas of 4<sup>th</sup> year) and the Radiology/Radiography examination broadened into a Principles of Clinical Practice exam. A haptic device will be purchased to aid teaching and development of students' skills in the rectal examination of cattle and horses.

3. Principles of Infectious Diseases course (4<sup>th</sup> year):

The integration of parasitology into this course will be completed and practical classes re-focused.

4. Integrated Animal Management course (4<sup>th</sup> year)

The separate courses of Animal Housing, Animal Welfare, Equine Husbandry and Management, and Nutrition will be combined into a single course, with a single assessment. The Integrated Animal Management course will commence in Michaelmas Term 2014. A Form and Conduct Notice related to the assessment was published in the 2013-14 academic year.

For all of the above, the length of the relevant VetMB Finals Part I assessment will be increased to reflect the increased examinable content.

5. Principles of Animal Management course (1<sup>st</sup> year)

This course will be restructured following the development of the Integrated Animal Management course and changes to the Neurobiology and Animal Behaviour course (2<sup>nd</sup> year) And will include material formerly included within the NAB course. This will also facilitate improved coordination of content between the PAM and IAM courses.

6. Neurobiology and Animal Behaviour course (2<sup>nd</sup> year)

Applied animal behaviour will move from this course to the Principles of Animal Management course and be replaced by lectures more focused on the neurobiology of behaviour and the roles of specific brain regions.

7. Clinical Skills Centre

Teaching in the new centre will commence in Michaelmas Term 2014 with both timetabled and 'drop-in' sessions. An academic lead for the centre has been identified.

### Upcoming significant changes

Outline of plans for any significant changes which are not detailed in Section 2. Please let us know about longer-term plans, as well as those which will be introduced in 2014-15.

#### Follow up on issues from 2013-14:

Monitoring (review/revision) of new changes introduced in 2013-14 will be conducted during 2014-15.

#### New proposals 2014 /2015

1. Veterinary Public Health course (4<sup>th</sup> year):

This course will be subject to internal review and revision, to include an increased practical components (eg: site visits). The aim is that the review will be conducted in Michaelmas Term 2014 for delivery in Lent-Easter Terms 2015. Changes to the assessment of this course were published in a Form and Conduct Notice during 2013-14.

2. A working party will be established to assess the feasibility of introducing a “Professionalism and Clinical Practice” strand into the curriculum. The aim of this strand would be to integrate and enhance the current dispersed teaching in these areas. The strand will be enhanced by the new Clinical Skills Centre and will develop novel methods of assessment to support student learning and competence.

Within this working party, a review of final year Electives will be conducted with a view to providing improved structure underpinning the research component and allowing more defined ‘tracking’ in a specialist clinical area.

3. A Teaching Quality Sub-group will be introduced, reporting to the Teaching Strategy Committee. A more formalised QA and feedback system will be developed for the clinical courses, including an annual Course Monitoring Report (which will incorporate student feedback and responses to that feedback, etc).

4. A series of course reviews will be initiated, each with an external advisor. It is planned that the first review will be of Farm Animal teaching.

5. Policies relating to dealing with students concerns and a statement on the purpose of Merton Hall Farm will be published.

6. A “you said, we did” page will be established, to aid communication with students and demonstration of changes implemented in response to feedback on the course.

6. For preclinical EMS, a compulsory 2 weeks dog/cat placement will be introduced for incoming 1<sup>st</sup> year students. A pre-clinical “driving licence” (Animal Management and Husbandry Online Placement Tool) will also be introduced.

7. The Department’s VLE will transfer from CamTools to Moodle in summer 2015.

### **Particularly effective and/or innovative practices**

Details of practices, which could usefully be brought to the attention of other University institutions.

Small group Directed Learning sessions were introduced in the Principles of Infectious Diseases course (structured scenario-based learning with problem-solving component). These proved popular with students, aiding deeper learning of lecture-based material and practical application of theoretical knowledge.

## University-wide quality enhancement themes

Quality updates are used to collect information or comments about specific themes to reduce the number of requests for information that are sent to Faculty Boards.

### Student feedback and engagement

The Education Committee would like to develop a more coherent approach to institution-wide surveys (such as NSS, PRES, PTES and the Student/International Student Barometer). To help inform this work it would like to gather information about the types of surveys conducted at Departmental level. It is hoped that targeting students so that they are not asked to complete more than one institution-wide survey each year, making better use of the data and improving feedback to students about resulting actions will help to increase participation, reduce duplication and survey fatigue and result in a more meaningful data set.

In providing information about Departmental questionnaires and surveys please distinguish between undergraduate, taught postgraduate and research postgraduate courses and, if possible, include links to, or attach examples of, the surveys.

- When, how often and at what level (lecture series, paper, year, Tripos etc) does the Department survey students? What do the surveys cover and are they conducted online or on paper?

A questionnaire is issued electronically on each course every other year or after a new course is introduced. This covers individual lecturer performance and overall impact of course. Students are encouraged to participate in the National Student Survey; a reward scheme for >80% response rate resulted in 88% students participating in 2013 and 82% participating in 2014. As a result, it is considered that the outcomes of the survey for veterinary students are representative of that student cohort.

- How does the Department consider and use the survey findings and communicate them and any resulting actions to students?

Results of questionnaires used by course organisers to improve and refine their course and by Director of Teaching in overall management of programme. Feedback is provided to students through the Student Consultative Committee.

- What steps does the Department take to promote engagement between student representatives and the rest of the student body?

There are student representatives on the Faculty Board of Veterinary Medicine, the Veterinary Education Committee and the Student Consultative Committee. When representatives are elected they have an initial meeting with the Secretary of the Faculty Board who outlines their role and the importance of adequately communicating with and representing their constituency. Student representatives are frequently asked as a result of their attendance on these committees to canvas student opinion and report back to the respective committee.

- What other methods does the Department use to solicit student feedback?

Director of Teaching has termly meetings with whole year cohort to elicit feedback. Feedback forms are available at any time so issues can be raised with the Director of Teaching who also has an open door policy regarding teaching issues.

Student representatives on Faculty Board.

A "Student Concerns Form" will be introduced in 2014-15 to facilitate anonymous student feedback for those with specific concerns.

### Supervision of graduate students

How is the quality of the supervision of graduate students assessed? (BGS' Code of Practice is online at: [www.admin.cam.ac.uk/offices/gradstud/practice/](http://www.admin.cam.ac.uk/offices/gradstud/practice/))

Supervisors and their projects are matched to students based both on student interests but also on the ability of the lab to support a project (resources and facilities). New supervisors are required to attend an induction course run by CPPD. Supervisors are reminded of their responsibilities by issue of an annual booklet, and are copied into monthly emails sent to graduate students detailing transferable skills training etc. Students and supervisors are asked to decide on an advisor who takes a second

supervisor role, whilst some of our supervisors prefer to be supported by supervisory teams. Supervisors are recommended to meet with students at least once per week and advisors or supervisory teams at least twice per term. Students are informed that they must take an active role in setting up these meetings.

The Department conforms to the formal model set up by the Degree Committee of Medicine and Veterinary Medicine and the Graduate School of Life Sciences. A formal assessment takes place at the end of the first year of the PhD, consisting of a report evaluated by two assessors who together with the supervisor report to the Degree Committee. In addition, supervisors are encouraged to produce short reports to CamGrad at least twice per year, although it must be admitted that this has worked poorly in this Department in the past few years. In addition we recommend that those taking MPhil by research produce a literature review by early in their second term, and that those doing a PhD produce a short report at the end of their second year for use by their supervisor, detailing in no more than 2 pages of A4 their major achievements in their PhD, together with a short timetable to indicate how they will finish their work.

## Required weblinks

Please check that the links are correct and the documents current and amend as necessary.

### a. Marking and classing criteria

<https://www.vet.cam.ac.uk/inform/2015>

Marking and classing criteria published on CamTools (<https://camtools.cam.ac.uk/portal.html>), together with a set of other information for examiners and assessors.

### b. Local guidance to examiners

On Vet\_Med\_:\_14\_15 Resources / For Teaching Staff / Examinations - Information for Examiners and Assessors - there are separate folders for Part I, II and III exams, plus general exam information that is relevant for every exam, such as the Board of Exams Examiners Guide.

### c. Local guidance about plagiarism and good academic practice

[http://www.biomed.cam.ac.uk/gradschool/degrees/good\\_conduct.html](http://www.biomed.cam.ac.uk/gradschool/degrees/good_conduct.html).

### d. Local statement on transferable skills

[http://www.skills.cam.ac.uk/undergrads/mvst\\_tskills.pdf](http://www.skills.cam.ac.uk/undergrads/mvst_tskills.pdf)

## Feedback to the University

Comments or questions about learning and teaching-related matters for the attention of the Education Section and/or the General Board's Education Committee.

## **Appendix 2: Learning and teaching review of the Department of Veterinary Medicine**

# GENERAL BOARD LEARNING AND TEACHING REVIEW OF THE DEPARTMENT OF VETERINARY MEDICINE

MARCH 2013

Executive summary

Introduction

Main conclusions

Good practice identified by the Committee

Summary of recommendations

The Department of Veterinary Medicine: background

Findings of the Review Committee

Appendices

Appendix A: membership of the Review Committee and its terms of reference

Appendix B: documentation received by the Review Committee

Appendix C: schedule of meetings

## Introduction

1. The Review Committee was established as part of the General Board's rolling programme of faculty and departmental reviews of learning and teaching. Following agreement between the General Board and the Council of the School of Biological Sciences, the review was scheduled to take place in the academical year 2012-13. The membership and terms of reference for the review are included as Appendix A.
2. The Review Committee met on two occasions. It first met on 28 January 2013 and considered a submission from the Department of Veterinary Medicine and other papers provided by Educational and Student Policy and the Council of the School of Biological Sciences. Its second meeting, which was held in the Department on 15 March 2013, included a number of meetings with students and members of staff in the Department. The documentation received by the Committee, and a list of meetings held on 15 March, are included as Appendix B.

## Main conclusions

3. The Review Committee was impressed with the standards of all the courses managed by the Department of Veterinary Medicine, and was satisfied that the teaching resources provided were appropriate. The academic staff who attended the meetings were clearly committed to the teaching activities of the Department, and the students were enthusiastic and supportive of the Department and its provision. The quality of teaching is at the highest level, the teaching environment is extremely positive and is endorsed by staff and students.

The Committee was particularly impressed by the very strong sense of community which was evident among both clinical and graduate students, and the seriousness with which teaching was so evidently taken throughout the Department. Students felt supported by the Department as well as their colleges. It was clear to the Committee that the 'Cambridge model' for veterinary education clearly worked very well and provided a valuable contribution to the landscape of veterinary education in the UK. In addition, it is clearly an education valued by the students.

4. The Review Committee concluded that the evidence reflected the courses as presented in the programme specifications, that the aims and learning outcomes were appropriate for the awards offered by the University, and that the standards of the courses were entirely satisfactory.

5. Whilst it makes a number of specific recommendations, the Committee concluded that there was no need to recommend a Full Review of the Department of Veterinary Medicine.

### **Good practice identified by the Committee**

6. The Committee wished to draw the General Board's attention to the following instances of good practice for dissemination to the wider University:
  - 6.1 The feedback systems from students relating to their courses was exemplary and the particular methods employed could be of interest in other institutions and were worthy of wider dissemination (*paragraph 41*).
  - 6.2 The financial support provided by the Department to students undertaking their Extra Mural Studies (EMS); such support is unique amongst UK veterinary schools (*paragraph 53*).
7. The Committee felt that the Department should also be commended by the General Board for:
  - 7.1 The new Resource Centre which provides an excellent student facility (*paragraph 49*).
  - 7.2 Widening Participation activity, which the Department is encouraged to continue to develop (*paragraph 47*).
  - 7.3 Its delivery of training in Communication Skills, which also should continue to be developed.

### **Summary of recommendations**

- 8.1 The Review Committee makes a number of recommendations and suggestions throughout its report. The key recommendations are gathered here and should be noted in the context of the report as a whole. The Committee recommends that the Department:
  - a) Should explore how the opportunity offered by the third year might best be exploited by all students, including encouraging more students to try research at Part II (*paragraph 33*);
  - b) ???;
  - c) Provide more preparation to students in readiness for their first placements in Year 4. A course similar to the Medical 'Preparing for Patients' was strongly recommended as a possible model(*paragraph 34*);
  - d) Make it a priority to keep alive the understanding of material from years 1 and 2 into Years 4-6. The mapping exercise to be undertaken in the summer 2013 was commended as a way to ensure this (*paragraph 35*).
  - e) Improve Classification Guidelines for students: the Department should review these and bring them up at least to the minimum standard expected (*paragraph 38*).
  - e) Reassess their existing arrangements relating to Senior Clinical Training Scholar involvement in assessment with a view to reducing possible conflicts of interest and training issues (*paragraph 39*).
  - f) Ensure that feedback to students following placements and rotations was provided more promptly and in greater detail to offer maximum benefit to students (*paragraph 40*).
  - g) Maintain a safe working environment at all times; periods of structural development would provide particular challenges (*paragraph 58*).
  - h) Improve communications with all stakeholders to ensure all those affected by decisions were kept fully informed eg the change to 40-week final year (*paragraph 61*).
- 8.2 The Committee also recommends that the General Board:

- a) should provide support to the Department to overcome the difficulties of adequate recruitment especially in relation to clinical posts(*paragraph 58*).
- b) Should note that the Department's building stock while adequate is at the bottom end of the spectrum for Veterinary Schools across the UK and should be brought up to standard across the board (*paragraphs 55 and 57*). In particular, the Lecture Theatre 1 needs significant refurbishment and this should be undertaken as soon as possible.
- c) Should encourage the appropriate bodies across the University to declare as soon as possible whether there exists any intention for the Department to be relocated or not (*paragraph 56*). Uncertainty was unsettling and was making long-term planning more complex.

### **The Department of Veterinary Medicine: background**

- 9 The Department of Veterinary Medicine aims to graduate approximately 65 clinical students each year, making it the smallest veterinary school in the UK. Arrangements for the first 3 years, that is the preclinical course, are delegated to the Faculty Board of Biology apart from two vocational courses in Years 1 and 2: 'Principles of Animal Management' and 'Preparing for the Veterinary Profession', which are overseen directly by the Faculty Board of Veterinary Medicine. The Faculty Board of Veterinary Medicine directly controls the clinical part (years 4–6) of the 6-year course and has overall responsibility for the course. The Final Vet MB degree, awarded at the end of Year 6, is registrable for the purposes of Membership of the Royal College of Veterinary Surgeons (MRCVS). The evidence seen by the Review Committee – QAA and student feedback, external examiners reports – indicates that the Faculty is performing well against national benchmarks.
- 10 The Department also has formal responsibility for the following research courses:
  - MPhil in Veterinary Science
  - PhD in Veterinary Science
 There are no taught MPhil courses in the Department.  
 The Department also runs post-graduate training for interns and residents who are required to undertake such training as part of their higher professional studies.
- 11 The preclinical courses in Years 1 and 2, which are shared with medical students, are aimed at teaching the scientific basis of veterinary medicine and lead to the Second Vet MB professional qualifying examinations as well as to examinations in the Medical and Veterinary Sciences Tripos (MVST). Successful completion of Part II of the Tripos at the end of Year 3 leads to the award of the BA degree. Year 3 is an intercalated year during which students have the possibility of studying a wide range of disciplines, although most choose a subject closely related to their veterinary studies; the third year also offers the option of completing a significant research project. Year 6 is a lecture-free year based on continuously assessed 'rotations'.
- 12 The learning outcomes of the course are designed to address the 'day one competences' specified by the RCVS; the Department undergoes regular assessment in order to maintain the accreditation of the course by the RCVS.
- 13 Extra Mural Studies (EMS) are a significant and compulsory part of the clinical course and are arranged by students themselves with support from the Department.
- 14 There are 30–40 post-graduate students in the Department and post-graduate clinical training scholarship programmes for interns and residents in the clinical areas are also offered. The Department has particular research strengths in: microbiology, virology and

immunity; neurosciences; epidemiology and modeling; genetics of disease and cancer genetics.

The Department takes part in several PhD programmes, which have a duration of three or four years, and embrace the 'one health' philosophy, accepting well-qualified medical and biological science students as readily as veterinarians.

- 15 The Department has 32 established academic staff and 8 established academic related staff, supported by a total of 18 unestablished academic-related staff (many in clinical roles) and 78 assistant staff. Some of the designations of the clinical staff in the Department are unique within the University.
- 16 The Department is located on the West Cambridge site. The Department operates small animal and equine hospitals, along with equine and farm animal ambulatory clinical services in order to provide clinical teaching material. Nearby at Madingley students have access to the 200 cow university dairy herd, as well as a sheep flock. The building estate of the Department is, in terms of quality, at the lower end of that found nationally; every other Veterinary School in the UK has undergone total refurbishment in the past eight years.

### **Findings of the Review Committee**

- 17 The report is structured around the terms of reference supplied by the General Board.

#### **A Overall structure of the institution**

- 18 As mentioned in paragraph 9, the Department is the smallest Veterinary School in the country, being no more than half the size of the next smallest equivalent institution. It is the only UK Veterinary school where the Head of Institution does not have direct control of the budget, and this, combined with the vagaries of the RAM, make it difficult to identify the extent to which the clinical facilities are a draw on University resources. The course focusses on establishing a secure scientific foundation and allows some limited specialisation in the final clinical year in the Elective period. The evidence suggests strongly that this approach works extremely well and provides students with both a secure scientific education and the requisite skills to meet the 'day one competences' required of Veterinary professionals.

##### **(i) Internal committee structures and principal officers**

- 19 The Department's committee structure was summarised in its submission. Following the last Teaching and Learning review the Department had streamlined these structures somewhat. The Veterinary Education Committee, which meets termly, maintains oversight and advisory responsibility so as to ensure a coherent and seamless course. This is essential given the dual responsibility for the 6-year course. It was reported that communication had improved between those responsible for the pre-clinical and clinical components of the course since the changes. The Department was commended for its awareness of the need to continue to improve communication between the various decision-making committees.
- 20 **The Committee recommended that the Department consolidate some of their remaining committees into a smaller body with the delegated authority needed to continue to maintain oversight of the whole course. Such a body should also be charged with ensuring consistency, particularly in relation to examining, and to ensuring closer collaboration with Natural Sciences and Clinical Medicine.**

- 21 Representatives of the teaching staff of the Department serve on the Department's own Teaching Strategy Board which reports to the Faculty Board of Veterinary Medicine (and if necessary to the Departmental Strategy and Executive Committee for resource matters). The Strategy Board meets twice termly and considers matters raised by staff, students, external examiners and external bodies such as the RCVS. Case studies provided by the Department suggested that communication between the committees was now more effective than had previously been the case.
- 22 Within the Department, Learning and Teaching activities are overseen by the Director of Teaching in conjunction with the Teaching Strategy Board and the Teaching Committee (both chaired by the Director of Teaching). A new Director of Teaching had just been appointed and, after detailed discussions, additional structures were being put in place to support the role, including the appointment of a deputy.
- 23 The current Head of Department was also due to stand down at the end of the academic year after nine years at the helm. Again it was clear that careful consideration had clearly been given to the appointment of a successor and to the support that the new Head will need.

(ii) Formal and informal links with other Faculties and Departments

- 24 The Faculty Board of Biology oversees the preclinical course within the MVST.
- 25 Representatives of the teaching staff of the Department serve on the Faculty Board of Biology and on relevant Departmental Teaching Committees such as Pathology and Pharmacology.
- 26 Staff of the Department contribute veterinary components to certain MVST courses such as Molecules in Medical Science (MIMS), Methods of Drug Action (MODA), Neurobiology and Animal Behaviour (NAB) and Biology of Disease (BOD). There were some difficulties with staff availability and timetabling which meant it could be difficult to deliver the courses consistently and optimally. **The Department was recommended to work on communication relating to these courses to encourage more flexibility in timetabling.**

**B The educational aims of the programmes provided**

- 27 The overall programme aims for the Final Vet MB, together with learning outcomes, were provided by the Department in the Programme Specification. Aims and objectives for each course are set out in the Curriculum Document which is available on the Departmental website (<http://www.vet.cam.ac.uk/stinfo.html>) for staff and students.
- 28 Aims and objectives are updated annually and changes are monitored by the Director of Teaching to ensure consistency with the overall aims and compliance with the overall guidance provided by RCVS/EAEVE for the approval of veterinary degree courses. In particular, the objectives are designed to meet the 'day one competences' guidance (paragraph 12). Day one competences are provided in hard copy to all students and published on the website. Each student records his or her practical experiences in a 'Black Book' to monitor their gradual acquisition of these competences.
- 29 While aims and objectives remain relatively constant between RCVS/EAEVE monitoring visits, it was clear that the curriculum is constantly modified and adjusted in order to address developments in veterinary science, feedback from external examiners, etc.

### **C Learning outcomes: knowledge and skills acquired by students during the institution's courses**

- 30 Learning outcomes address the 'day one competences' and the Benchmark Statement for Veterinary Medicine, taking into consideration the Criteria and Guidance for RCVS Approval of Veterinary Degree Courses in the UK and Overseas. The Department is to be commended for the proficiency which its students so clearly achieve, and for their development in all areas.
- 31 The Department was content that the vast majority of undergraduate students came to the course intending to become practising veterinarians. It was felt that the course was sufficiently broadly based to provide adequate preparation for those who wished instead to pursue research.

### **D - Curricula and assessment of the institution's courses**

#### **(i) Course design**

- 32 The Veterinary Medicine course is complex, but a guiding principle is that across all 6 years it is founded on evidence-based science. The Department is commended for insisting that individual lecturers and Course Organisers review their courses each year to take account of developments in their subject area. Specific issues were raised about the relevance of the content of the Pharmacology course which seemed out of date in relation to drugs currently in use in veterinary practices, and **the Department is recommended to ensure course content is relevant across all years, pre-clinical as well as clinical.**
- 33 The third year was viewed by some as 'marking time' for students. **The Department is recommended to consider ways in which the opportunity offered by the third year might best be exploited by all students.**
- 34 After three years of pre-clinical training, students go straight into practical training at the start of Year 4. Many students felt ill-prepared for this. Often they were placed in environments where it was expected that after 3 years of training they would already possess competences which they had not yet developed, and clinical knowledge they had had no opportunity to obtain. **The Committee strongly recommended the institution of a training course, along the lines of the 'Preparing for Patients' course offered in Medicine, to enable students to face the demands of their first clinical placements with confidence.**
- 35 The Department was undertaking a mapping exercise to ensure that material taught in Years 1 and 2 is kept 'alive' appropriately through Years 4-6. The need to maintain this knowledge was highlighted as a concern by the students. **The Committee strongly recommended this mapping take place as planned, and that it be followed up with the implementation of strategies designed to keep relevant knowledge 'live' throughout the course.**

#### **(ii) Teaching methods**

- 36 Teaching methods include: lectures, laboratory practicals, small group rotational practical sessions, case-side learning, dissertation preparation and individual presentations. The methods used depend on staff skills, group sizes and resources available, and in some cases e.g. lambing, the teaching needs to be coordinated with a specific cyclical event.
- 37 The volume of veterinary knowledge and the variety of technology used in veterinary practice are ever-increasing. While members of the Department displayed an awareness of these factors, the consensus was that the scientific foundation of the course was adequate to equip all graduates with the capability both to absorb new information and

acquire new skills, something they were obliged to do to maintain their professional registration. It was apparent that nationally Veterinary Medicine lagged somewhat in the early adoption of new techniques and advances in knowledge, and the Department was keeping up relatively well in comparison with other institutions.

iii) Assessment methods

- 38 The examination classification criteria were judged by the Committee to be barely sufficient according to University guidelines. For the benefit of both students and examiners **the Department should review these and bring them, as a matter of urgency, up to the standard expected by the University.**
- 39 Assessment training had been provided for staff, particularly to address the setting and marking of examination questions in the formats used in the Department (multiple choice, short answer, essay and continuous assessment) but the uptake did not appear to be 100%. **The Department is strongly recommended to ensure that in particular where Senior Clinical Training Scholars are involved in making assessments, they had undertaken appropriate training. In addition, close attention should be paid to possible conflicts of interest that any Senior Clinical Training Scholars may have.**
- 40 Placements and rotations were assessed on an ongoing basis and feedback provided to students. However, feedback was often delayed and sometimes insufficiently detailed to be of use to students. **The Department is recommended to ensure that students received all feedback in a timely fashion, and that it is sufficiently detailed to be useful.**
- 41 The feedback systems used by the Department for students to report back on their courses were exemplary, and other departments in the University could well benefit from sharing this example of best practice.

(iv) Achievement of learning outcomes

- 42 Achievement of learning outcomes is monitored through examination and progression data. The system of examinations resits means that overall failure and drop out from the course is rare, and in particular failure is often associated with personal problems. The Veterinary School Clinical Supervisors (VSCS) scheme (*see also para 51*) is particularly helpful in identifying and supporting students with particular needs and personal problems.
- 43 There was evidence that some students had had little previous exposure to horses before beginning their courses. These students were reported to have more difficulty with the equine component of the course than those from a background where horses were familiar. Students confirmed that the Department had shown awareness of the possible problems this lack of comparable experience could create, and worked hard to address inequalities without making individual students feel inferior. The Department is to be commended for this responsive and sensitive approach.

(v) Transferable skills

- 44 The two vocational courses in Years 1 and 2 of the preclinical course, Principles of Animal Management and Preparing for the Veterinary Profession, provide a range of transferable skills. The latter, in conjunction with courses given during the clinical course, helps to prepare students for running a small business, which is especially important as many are likely to need such skills when they go into private practice.
- 45 As noted in paragraph 37, technology within veterinary medicine is constantly advancing. The Department was confident that students are given sufficient basic scientific skills and

knowledge of techniques to cope with such advances, and their ongoing training requirements allow them to upskill when necessary.

- 46 The Committee felt that that there could be much greater connection between clinical training and the research undertaken in the Department. It felt that establishing a stronger connection between these two aspects of the Department's work will be beneficial to both.

## 5. Student support

### a. Student admission

- 47 The Department was commended for its Widening Participation work which includes bursaries for up to 10 students from disadvantaged backgrounds to participate in the two-day residential VetCam course (aimed at year 12 students). The Department should continue to monitor the impact in terms of any increase in the number of applications from such students and their rates of success.
- 48 It was considered impossible to increase undergraduate student numbers without significant financial investment. Resources, in particular for the pre-clinical parts of the course, were adequate for current numbers, but expansion was not an option. Efforts such as the two Open Days run in July were focused on maintaining the high standard of applicants as well as widening participation.
- 49 The Student Resource Centre was a high-class facility greatly appreciated by students and an asset to the course as a whole. The Department was to be commended for pursuing its development.

### b. Student support arrangements

- 50 Students were quick to praise the very supportive nature of the Department's Academic Support Office, and for this the Department is to be commended. While colleges are the major source of support (including important financial support) for the first three years, the Department comes into its own in years 4-6. However, even in these latter years colleges often remain the first port of call for financial support, and it was noted that the ability of a college to help in this way was very much dependent on the wealth of individual colleges. Liaison between colleges, the Department, the School of Clinical Medicine, the Senior Tutors' Committee and the Faculty Board of Veterinary Medicine are maintained by the Medical and Veterinary Progress Panel which reviews student progress and considers individual student cases.
- 51 Nationally, veterinary medicine has a problem with student mental health problems and a higher than average rate of suicide. The Department was well aware of the concerns and is to be commended for putting into place a number of initiatives to support students who may face difficulties, including the VSCS system, the Medical and Veterinary Student Progress Panel, as well as sessions for students and staff on coping with stress.
- 52 The Committee supported the Department's concerns that the current 'Fitness to Practice' regulations which cover ethical and professional behaviour by students might actually allow students to qualify but who nevertheless might find it very difficult to deal with the realities of employment as a veterinarian. **The Department is urged to monitor this dichotomy carefully.**

### c. Placement learning and collaborative provision

- 53 Students spend considerable time on EMS outside term-time. This is an essential part of the course and provides extremely valuable experience. It is also provided free of charge

by veterinary professionals, which is an enormous benefit to the University and provides excellent value for money. Many of the direct costs of EMS fall onto students, and Cambridge is the only veterinary school in the UK which provides help with these costs. The Department offers £100 per annum per student for each of the 3 years of the clinical course towards travel, as well as a subsistence allowance of £4 (home-based) to £6 (non-home-based) per diem for up to 180 days over the three years. The Department is strongly commended for this unique support.

## 6. Learning resources

### a. Resources

- 54 As mentioned in paragraph 49 the new Student Resource Centre has had a significant impact on the day-to-day lives of the students. It is the one facility on the site which compares well with provision elsewhere in the UK.

### b. Accommodation

- 55 **The General Board is strongly recommended to ensure funding is available to upgrade the Department's accommodation to an appropriate level so the Department can continue to attract top applicants to the course and to teach them in up-to-date surroundings.** The Department is to be congratulated on the extensive and successful fundraising it has been undertaking, but more support is needed from within the University itself to improve the existing estate.
- 56 Refurbishment and updating has been taking place in specific areas e.g. total replacement of microscopes, the imminent provision of the new Clinical Skills lab as part of a £3.2m redevelopment of the veterinary Hospital in 2013-14, but further work may be handicapped by uncertainty about the future of the Department on the current site. **The General Board is strongly recommended by the Committee to clarify to the Department as soon as possible if there are plans for the Department to move elsewhere and, if so, the possible choice of sites and the timescale.** The Department would prefer to move to the Addenbrookes site so as to maximize the changes for advantageous collaboration; as second choice it would prefer to remain in situ. North West Cambridge was seen as the least desirable site, since the resulting isolation would damage the possibilities for integration with biological sciences and medicine. In addition, **the Committee strongly recommended that the strong research base within the Department should be retained.** It would be extremely undesirable to split the research from the clinical activity.
- 57 **The General Board is strongly recommended to ensure that the Lecture Theatre 1 is brought up to an acceptable standard as a matter of urgency.** An internal refurbishment would transform the utility of this key teaching facility.
- 58 The Committee noted that during its visit the ongoing building work meant that the working environment was less safe and professional than might be desirable. **The Department was strongly recommended to be sure to maintain the appropriate standards, even during refurbishment work.**

### c. Staff

- 59 The Committee strongly recognised the complex demands in delivery of a high quality veterinary training, and the difficulty in particular in recruiting clinicians. There needs to be a mechanism within the University to enable an appropriate market supplement to be paid to clinicians so as to retain their services. There is a marked salary differential between the University and private clinical practice, and particularly in referral clinical practice where the direct competition for staff lies. A blanket rate for all such posts is wholly inappropriate and current salaries on offer are evidently not even competitive with packages available at other

Veterinary Schools. **The General Board was strongly urged by the Committee to work with the Department as a matter of urgency to address this difficulty.**

60 **Meanwhile the Department was encouraged to develop models mirroring the tenure-track appointments of research-intensive institutions to ensure clinical work, research and teaching could all be covered adequately. In developing such a scheme, it would be important to articulate the characteristics of the roles that were needed by the Department.**

61 A large number of staff dispersed across a large site could easily lead to communication failures. Some clinicians and support staff reported that they suffered from being omitted from communication chains. **The Department was recommended to review its lines of communication to ensure all key stakeholders were kept fully informed about essential information and developments.**

## **7. Maintenance and enhancement of standards and quality**

62 The Review Committee was pleased to note that the Faculty has robust arrangements for sourcing student feedback, including rigorous student questionnaires (see paragraph 41), for analysing external examiners' reports and for analysing examination questions to ensure standards and comparability.

63 External accreditation takes place regularly and the Department prepares every 7-10 years for major visitations by the RCVS. Accreditation is essential since without it graduates would not be able to submit the Cambridge Vet MB for their registration with the RCVS. At the moment the Department entertains no plans to pursue international accreditation outside the EU.

64 The Review Committee is most grateful to the Department of Veterinary Medicine for providing an extremely extensive range of information, for its immaculate arrangements for the visit of the Review Committee, and for the open and engaged approach of all staff and students consulted during the Review.

**Mary Howe  
Academic Division  
March 2013**

## Appendix A

### Membership of the Committee

Dr James Keeler	Department of Chemistry (Chairman)
Dr David Good	School of Biological Sciences
Prof I Sadaf Farooqi	Institute of Metabolic Science
Prof Stuart Reid	The Royal Veterinary College (external member)
Mr Richard Jones	Faculty of History (Student member)
Mrs Mary Howe	Academic Division (Secretary)

### Terms of Reference

**Learning and Teaching Reviews (LTRs) cover all programmes** at the undergraduate, taught postgraduate, and research postgraduate level (including any collaborative and/or part-time provision).

#### 1. Overall structure of the institution

- Internal committee structures and principal officers
- Formal and informal links with other faculties and departments

#### 2. The educational aims of the programmes provided by the institution

#### 3. Learning outcomes: knowledge and skills acquired by students during the institution's courses

#### 4. Curricula and assessment of the institution's courses

- Course design
- Teaching methods
- Assessment methods
- Achievement of learning outcomes
- Transferable skills

#### 5. Student support

- Student admission and induction
- Student support arrangements
  - Undergraduate supervisions (if relevant)
  - Research student support (if relevant)
- [If relevant] placement learning and collaborative provision

#### 6. Learning resources

- Resources
- Library, IT, accommodation
- Staff
  - Induction and guidance
  - Staff development and review

#### 7. Maintenance and enhancement of standards and quality

- Review of learning and teaching provision

- b. External quality assurance
  - External Examiners' reports
  - External advisors
  - Accreditation (where relevant)

## Appendix B

### Documentation received by the Review Panel

- VM1 Submission from the Department of Veterinary Medicine and appendices:
1. Departmental Committees – remits and minutes
  2. Veterinary School Clinical Supervisors (VSCS) system
  3. Staff training
  4. Roles in Management of Teaching
  5. Programme Specification
  6. RCVS/EAEVE guidelines for approval of veterinary courses
  7. RCVS Day 1 competences
  8. Annual Quality updates
  9. QAA Benchmark statement for Veterinary Science
  10. Curriculum Document
  11. Preclinical EMS
    - Clinical EMS
    - Electives
    - RSPCA Clinic
    - Final Year Rotations
  12. Clinical Check (“Black Book”)
  13. EMS Assessment Form
    - EMS Assessment feedback form
  14. External Examiners’ reports and responses
  15. Marking and classing criteria
  16. Exam questions and model answers
  17. VetCam information
  18. Orientation programme for new 4<sup>th</sup> years 2012
  19. 5<sup>th</sup> year Professional Preparation week
  20. Fitness to Practice Regulations
  21. Student Code of Conduct and register
  22. Medical and Veterinary Student Progress Panel
  23. Code of Practice for research students
  24. Insurance on Extra Mural Studies
  25. Abattoir course at Bristol
  26. List of Associate and External Lecturers 2012-13
- VM.2 Feedback questionnaires – 4<sup>th</sup> year courses
- VM.3 Feedback questionnaires – 5<sup>th</sup> year courses
- VM.4 NSS 2011 VetMed
- VM.5 NSS Final Vet 2012
- VM.6 Report VetMed 2006 Final
- VM.7 RCVS EMS – recommendations – guidance 2011
- VM.8 Transferable Skills
- VM.9 Student Resources Centre Protocols
- VM.10 Veterinary examples for preclinical teaching
- VM.11 GBEC Minutes with any references pertaining to the Department of Veterinary Medicine (2009-2012)

- VM.12 RCVS accreditation
- VM.13 Staff List as at March 2012
- VM.14 Submission from the Careers Service, dated 9 October 2012
- VM.15 Student statistics
- VM.16 Student Headcount

The department also provided a useful categorisation of these documents

**Appendix C**  
**Schedule of meetings for all-day visit 15 March 2013**

8.30-9.30	Review Committee – Private meeting Refreshments	Review Committee
9.30-11.00	Meeting with the Head of Department and other staff with key responsibilities in both undergraduate and graduate teaching provision <i>The Head may give a short introduction before the Review Committee begins questions.</i>  Declarations of interest.  Chair: Dr James Keeler	Dr Jane Dobson <i>Final year rotation organiser</i> Professor Michael Herrtage <i>Dean &amp; Deputy Head of Department</i> Mr Andy Jefferies <i>Director of Teaching</i> Professor Duncan Maskell <i>Head of Department</i> Dr Penny Watson <i>EMS co-ordinator</i> Dr David Sargan <i>Director of Graduate Education</i> Professor Alun Williams <i>Director of Teaching from 1/10/13</i> Professor James Wood <i>Equine &amp; Farm Animal Science</i> Ms Judith Drinkwater <i>Secretary of Department</i>
11.00-11.30	Review Committee - Private meeting Refreshments	Review Committee
11.30–12.30	Site visits ( <i>This should include any areas which the Department feels are unsatisfactory, as well as at least one of which they are proud, and anything else to which the Committee’s attention should be drawn. The Committee could be split into two groups if necessary.</i> )	Professor Duncan Maskell Professor Michael Herrtage
12.30–2.00	Sandwich lunch with students, both undergraduate and postgraduate ( <i>about 12 people, giving a cross-section over all years</i> )	Hannah Darcy 6 <sup>th</sup> year David Haine 6 <sup>th</sup> year Kingsley Warren 6 <sup>th</sup> year Amalie Roche 5 <sup>th</sup> year Stephanie Hughes (Affiliated) 5 <sup>th</sup> year Maheeka Seneviratne 5 <sup>th</sup> year Hannah Mathie 4 <sup>th</sup> year Joel Higgin (Affiliated) 4 <sup>th</sup> year Laura McLeod 4 <sup>th</sup> year Sylvia Agathou <i>Graduate (PhD-BBSRC)</i> Abbe Crawford <i>Graduate (PhD Wellcome Trust)</i> Jiro Sakai Graduate ( <i>PhD Cambridge Overseas Scholarship</i> )

2.00-2.30	Review Committee - Private meeting	Review Committee
2.30–3.00	Meeting with staff whose primary focus and/or responsibility is clinical teaching Chair: Dr Keeler	Dr Peter Fordyce <i>RSPCA first opinion clinic</i> Miss Sorrel Langley-Hobbs <i>Small Animal Surgery</i> Mr Ian McCrone <i>Farm Animal</i> Dr Mark Reading <i>Small Animal Medicine</i> Dr Heike Rudorf <i>Radiology</i> Miss Kate Smith <i>Equine Surgery</i>
3.00-3.30	Meeting with support and administrative staff Chair: Dr Keeler	Miss Katheryn Ayres <i>Academic Support Officer</i> Miss Kathy Challis <i>Radiographer</i> Miss Sharon Chandler <i>Head Small Animal Veterinary Nurse</i> Ms Judith Drinkwater <i>Secretary of the Department</i> Mrs Lorraine Leonard <i>Librarian &amp; Information Assistant</i> Miss Sarah Seaman <i>Head Large Animal Nurse</i> Miss Miranda Stock <i>Academic Support Assistant</i> Mrs Rayna Skoyles <i>Teaching Laboratory Technician</i> Mrs Meg Staff <i>Research and Graduate Education Officer</i> Ms Chrissie Willers <i>Post-Mortem Room Technician</i>
3.30-4.30	Review Committee - Private meeting Refreshments	Review Committee
4.30-5.00	Meeting with HoD and other members of institution to give feedback Chair: Dr Keeler	Dr Jane Dobson <i>Final year rotation organiser</i> Professor Michael Herrtage <i>Dean &amp; Deputy Head of Department</i> Mr Andy Jefferies <i>Director of Teaching</i> Professor Duncan Maskell <i>Head of Department</i> Dr Penny Watson <i>EMS co-ordinator</i> Dr David Sargan <i>Director of Graduate Education</i> Professor Alun Williams <i>Director of Teaching from</i>

		<i>1/10/13</i> Professor James Wood <i>Equine &amp; Farm Animal Science</i> Ms Judith Drinkwater <i>Secretary of Department</i> Miss Katheryn Ayres <i>Academic Support Officer</i>
5.00-5.30	Review Committee - Private meeting if needed.	Review Committee

**Appendix 3: Cambridge Course Overview**

## Overview of Cambridge Veterinary Medicine Course

Cambridge year 1	Cambridge year 2
<p><b>MOLECULES IN MOLECULAR SCIENCE (MIMS):</b> an introduction to <i>Biochemistry, Molecular Biology, Molecular Cell Biology and Genetics</i>. Students should understand the principles of protein structure and enzyme catalysis; bioenergetics and metabolism; nutrition in the healthy and diseased state; membrane dynamics and hormone signalling; organisation, replication, and repair of genomes; transcription, translation, and control of these processes; proliferation &amp; death in normal and cancer cells; proteins and molecular recognition in cells; <i>Mendelian genetics</i> and an introduction to understanding complex phenotypes based on DNA sequence and functional approaches. <i>Cancer biology</i> and genetics are introduced here, and built upon in BOD in year 2.</p> <p><b>HOMEOSTASIS (HOM):</b> students cover <i>Cellular Electrophysiology and Nerve</i> including nerve tissue, the neuromuscular junction and connective tissue; <i>Muscle; The Vascular System and Blood</i>, concentrating on the heart and circulation; <i>Epithelial tissue; The Respiratory system: Fluids and Electrolytes</i>, including the roles of the urinary system, adrenal gland and digestive tract; <i>Digestion, Absorption and Storage</i> including the functions of the salivary glands, liver and pancreas; thermoregulation and metabolic integration; the functions of the thyroid, parathyroid and pituitary glands</p> <p><b>HISTOLOGY:</b> students are introduced to the histology of normal tissues and cellular organisation. This course supports first year homeostasis (HOM), anatomy and physiology (VAP), and second year biology of disease (BOD) and neurobiology (NAB). By the end of this course students should be able to recognise normal tissue and organ structures, plus identify specialised cell types within the tissues. Classes cover; <i>Connective Tissue, Nerve, and Neuromuscular Junction; Skeletal, Cardiac and Smooth Muscle; The Vascular System and Blood, Epithelia and Skin; Respiratory System; Urinary System and Adrenal Gland; Alimentary System; Salivary Glands, Pancreas and Liver, Thyroid, Parathyroid and Pituitary Gland.</i></p> <p><b>INTRODUCTION TO THE SCIENTIFIC BASIS OF MEDICINE (ISBM):</b> the course covers basic principles of <i>Epidemiology and Medical Statistics</i>. At the end of the epidemiology course students should be able to - Understand of different measures of rates and risks and their application in practice; Understand of principles of screening, and measures of validity of test including sensitivity, specificity and predictive value and their relevance to practice; Understand how to make comparisons: basic epidemiologic study designs (cross sectional, case control, longitudinal and intervention studies), their strengths and limitations; interpret data appropriately and to make sensible inferences from such data; understanding and definitions of bias and confounding, and concepts of causality and generalisability; evaluate scientific literature critically and sensibly.</p> <p>At the end of the statistics course students should be able to</p> <ul style="list-style-type: none"> <li>• Appreciate the role of statistics in medicine;</li> <li>• Develop a 'statistical eye' when viewing data or reading the literature;</li> <li>• Understand statistical and epidemiological principles of design/analysis;</li> <li>• Know when and how to apply basic statistical methods; Realise the need to consult a statistician at appropriate times</li> </ul> <p><b>VETERINARY ANATOMY AND PHYSIOLOGY (VAP):</b> The vertebrate body; domestication; early embryo development including embryo folding and segmentation; <i>locomotor system</i></p>	<p><b>BIOLOGY OF DISEASE (BOD):</b> this course covers the following areas</p> <p><i>The Immune system</i> - Innate Immunity; Inflammation including acute inflammation; Complement; The Adaptive Immune System; B Cells and Antibodies; The Major Histocompatibility Complex; T Cells; Response to infection/Tolerance; Autoimmunity; hypersensitivity; Transplantation</p> <p><i>Virology-</i> The Nature of Viruses; Viral Multiplication in the Host Cell; Responses to Viral Infection; Acute and Chronic Infection; Epidemiology of Viral Infection; Combating Viral Infection</p> <p><i>Prion Diseases</i></p> <p><i>Introduction to Parasitic Diseases;</i> Protozoa; Helminths; Fungi</p> <p><i>Bacterial Disease</i> - Past, Present and Re-emerging; Prokaryotic Pathogens; Host Interaction and Pathogenicity; Host Damage, the roles of toxins and the host response; Bacterial Pathogenicity in the Gastrointestinal Tract; Combating Bacterial Disease</p> <p><i>Vascular reactions to injury;</i> Atherosclerosis, Thrombosis / Infarction; Ischemia, infarction and their results</p> <p><i>Oncology:</i> The Regulation of Tissue Growth and Organisation; Clinical Pathology of Tumours; Biology of Tumours; Genetic Basis of Neoplasia; Causes of Cancer</p> <p><b>MECHANISM OF DRUG ACTION (MODA):</b> this course aims to provide an understanding of the basic mechanisms of drug action at the levels of both drug-receptor interactions and the effects on body systems. Attention is focused not only on the current use of drugs, but also on a framework for evaluating future therapies. Topics covered in the lectures are: <i>Drug Interactions with Receptors and Ion Channels; Pharmacology of Peripheral Neural Transmission; Cardiovascular and Renal Pharmacology; Pharmacokinetics, Drug Metabolism, and General Anaesthetics; Pharmacology of Inflammation and Immunosuppression; Chemotherapy ; Human Aspects of Cardiovascular and Renal Pharmacology; Anthelmintics; Aspects of Special Veterinary Pharmacology</i></p> <p><b>NEUROBIOLOGY AND ANIMAL BEHAVIOUR (NAB):</b> the course introduces the scientific concepts underlying the study of the central nervous system; provides students with an understanding of the principles underlying sensory, motor, motivational and cognitive processes, and how these contribute to behaviour; considers the functional and behavioural consequences of disorders of the nervous system, and how they might be influenced by drugs; provides core knowledge relevant to a career in veterinary medicine.</p> <p><b>COMPARATIVE VERTEBRATE BIOLOGY (CVB):</b> this course is divided into two sections, one of which covers vertebrate structure and function, and the other comparison of the head and neck. A sound knowledge of the structure and development of the head and neck is essential to gain an accurate understanding of neurology, ophthalmology, ear, nose and throat medicine, respiratory medicine, anaesthesia, gastroenterology, endocrinology, dentistry and some aspects of orthopaedics. The developmental parts of the Head and Neck course will be of considerable value in understanding jaw structure and feeding mechanisms in non - mammalian vertebrates. Although the Vertebrates course is dominated by a study of domestic birds, the other major vertebrate groups - fish, amphibia, reptiles - are also considered in some detail.</p>

## Overview of Cambridge Veterinary Medicine Course

including, gaits, forelimb design, muscle and tendon, bone and cartilage, joints, hindlimb design and limb development, including details of the equine limb, hoof and claw; *Spine; Body wall; Skin; Neurology* including the spinal nerves and autonomic nerves; *Cardiovascular system* including arteries, veins, heart and CVS development in embryogenesis; *Lymphatics; Respiratory system* including thorax, lungs; *Gut development* including the structures and functions of the oesophagus, simple stomachs, compound stomachs, compound stomach motility, intestines, liver and pancreas; *Specialist digestive systems*: ruminant digestion, equine digestion, rabbit digestion; *Urinary system* including kidney, urinary and reproductive tracts and genito-urinary development in embryogenesis. Practical classes include dissections, live animal handling, and interpretation of radiographic and other imaging techniques.

**PRINCIPLES OF ANIMAL MANAGEMENT (PAM)**: this course offers a broad introduction to the important features of animal management; nutrition, reproduction, genetics and breeding, housing and environmental control, behaviour and welfare. Lectures cover UK agriculture; Farm Safety: Housing and husbandry; Public Health: Nutrition and foodstuffs; Animal Welfare.

Specific species covered in lectures and practical animal handling classes include:

- Sheep
- Equine,
- Cattle,
- Pigs
- Poultry and cage birds
- Cats & Dogs
- Lagomorphs
- Exotic Animals – rodents, caviars, reptiles, amphibia
- Other production species (fish, deer, camelids).

**VETERINARY REPRODUCTIVE BIOLOGY (VRB)**: this course covers –  
*Endocrinology*

*Comparative Aspects of Reproduction*: Comparative Male Anatomy, Comparative Female Anatomy; Placental Structure; Fertility; Obstetrics: Comparative Neonate

*Reproduction*: Sexual differentiation; Spermatogenesis; Sperm Maturation and Fertilisation; Oogenesis and ovulation; Oestrus and menstrual cycle; Fertility

*Development*: Embryogenesis; Maternal recognition of pregnancy; Placental Function; Fetal Growth

*Birth and the Neonate*: Maternal Adaptations for Birth; Fetal Preparations for Birth; Parturition; Neonatal Physiology; Lactation

**PREPARING FOR THE VETERINARY PROFESSION (PVP)**: this course is an introduction to understanding the role, development and public standing of the veterinary profession in the UK. To understand the role of vets in the protection of society's health from animals, their products and their management systems. To appreciate human and animal health economics and the role of veterinarians in fulfilling society's obligations to animals.

*Veterinary Ethics*; to understand and be able to have reasoned discussions on the ethical issues relating to the use of animals in research, farming, sport and in other areas and the issues relating to the treatment of terminal diseases in animals.

*Public health, food safety, zoonotic and notifiable diseases*. The role and organisation of the Animal and Plant Health Agency, the State Veterinary Service, the Food Standards Agency, and other relevant Government Agencies. To understand the role of the veterinary profession in the safeguarding of public health, the diagnosis and control of economically significant and zoonotic diseases. To appreciate the processes involved in the safe production of food from farm animals. To understand the role and importance of the veterinary profession as stakeholders in international and national organisations involved in the control of animal and human disease.

*Modern structure of veterinary profession*: to understand the breadth and scale of veterinary practice in the UK as an introduction to the business of practice

*Communication skills and the veterinary profession*; to understand the importance of good communication skills in veterinary work with both small and large animal clients and professional colleagues. To provide a foundation for further communication skills training in the clinical course. Veterinary communication: Regulation, compensation and ethical issues: the roles of the RCVS, VDS and BVA in litigation, discipline and ethical conduct and in the protection of the public and veterinary surgeons.

## Cambridge year 3

Final honours year: students complete a Tripos Part II subject of choice, leading to an Honours Degree. The majority of students will undertake final year honours study in a scientific discipline. This includes either a laboratory based research project or an extended dissertation in a chosen area of cutting edge science.

Further details are available at

<http://www.biology.cam.ac.uk/undergrads/mvst/course-details>

Cambridge year 4	Cambridge year 5
<p><b>EVIDENCE-BASED MEDICINE (EBM):</b> the lectures look at the use of scientific method in veterinary medicine. They incorporate the use of knowledge, the use of external sources (such as publications), critical appraisal of the presented evidence, statistical analysis and decision making. Lectures are supplemented with reading materials and on-line resources.</p> <p><b>ALIMENTARY SYSTEM:</b> this course covers the examination of the alimentary system, investigative approaches, and diagnoses of common pathologies of the oral cavity, oesophagus, stomach, and gastro-intestinal tract, as well as the liver and pancreas. Pathologies include infectious agents (viruses, bacteria and parasites), oncology and toxicology. Students should understand the role of the normal gut microbiome, the problems associated with routes of infection, zoonoses, and implications for food safety. Histopathological and biochemical investigations, data handling and interpretation are supported by practical classes. Lectures cover the importance of pharmacological interventions and treatments, and their impact on the alimentary tract.</p> <p><b>RESPIRATORY SYSTEM:</b> the lectures look at the fundamentals of the respiratory system, its defence mechanisms, common diseases of the respiratory tract, pleura and pleural cavity. The use of drugs to treat inflammatory conditions and anti-microbials is covered. Lectures are supported by a practical class.</p> <p><b>OPHTHALMOLOGY:</b> lectures cover the common problems associated with the eyelid, cornea, lens, and retina. Species specific differences between the equine eye and companion animals. Important eye diseases of production animals.</p> <p><b>ANIMAL BREEDING:</b> this course focuses on the clinical and practical aspects of efficient reproductive husbandry and breeding in: cattle; sheep and goats; horses; dogs and cats; pigs; common exotic species. Lectures cover hormonal and physical changes associated with sexual maturity in males and females; reproduction and fertility problems; pregnancy, labour and neonatal health and development. The importance of AI, IVF and embryo transfer systems within the modern commercial context is discussed. Lectures are supplemented with practical examinations of cattle, assisting with supervision during the lambing season, and computer assisted learning.</p> <p><b>INTEGRATED ANIMAL MANAGEMENT:</b> these lectures incorporate legal, ethical and practical aspects of animal welfare, and assessment of production animal transport and slaughter conditions. Housing, nutritional, behavioural and physiological measures of welfare are considered within the context of the following species: companion animals, laboratory animals, rabbits and commonly kept exotics, horses, cattle, sheep, pigs, poultry and commonly kept wild animals. Lectures are supplemented with scenario-based learning and assessments.</p> <p><b>EXOTIC, WILDLIFE &amp; CONSERVATION MEDICINE:</b> this lecture course prepares students for the diagnosis, management and treatment of disease, as well as disease control and prevention in exotic, wild, and zoo animals. Species include rabbits, ferrets, small mammals, caged and captive avian species, reptiles, amphibians and fish. Other common husbandry and nutritional problems are addressed.</p> <p><b>POULTRY HUSBANDRY &amp; DISEASES:</b> these lectures cover the structures of poultry and gamebird breeding systems, including genetics, fertility, reproduction, different housing practices, and identification and management of common diseases.</p> <p><b>SMALL RUMINANT HUSBANDRY AND MEDICINE:</b> this course builds on the background</p>	<p><b>INTRODUCTION TO EMERGENCY AND CRITICAL CARE:</b> this course equips students to deal with emergency situations and first aid, primarily in companion animals, alongside reviewing the communication skills required to deal with veterinary teams and distressed owners.</p> <p><b>CARDIOLOGY:</b> this course covers clinical examination of the cardiovascular system; diagnostic techniques and interpretation; congenital heart diseases; cardiomyopathies; congestive heart failure; acquired heart disease; common toxicology; pharmacological treatment of heart conditions. Companion animals, farm animals and equine cardiology are included. Lectures are supported by practical sessions and extensive on-line materials.</p> <p><b>DERMATOLOGY:</b> lectures cover the structure and function of the skin; viral, parasitic, bacterial and fungal infections; allergies and autoimmune disorders; ear diseases and neoplasias. Practicals include identification of diseases from histopathological samples, and are supported by on-line materials.</p> <p><b>NEUROLOGY:</b> this course builds on the basics from NAB in year 2. The dog is used as the primary example throughout. Lectures address neuropathologies; techniques for examination; diseases of the brain and spinal cord, including presentation, diagnosis and pathology; peripheral nerve damage and muscle disease; epilepsy. Diagnosis in horses is covered independently. Practical classes and on-line materials support the lectures.</p> <p><b>UROLOGY:</b> these lectures cover aspects of renal and urinary function; diagnosis and treatment of urinary and renal disorders including congenital, infectious and nephrotoxic agents; clinical pathology and renal function testing. Lectures are supported by practical sessions with case histories, clinical rotations and on-line materials.</p> <p><b>ENDOCRINOLOGY &amp; METABOLIC DISEASES:</b> the course covers common endocrinopathies (including those of the thyroid, parathyroid, adrenal system) and metabolic disorders (diabetes, and regulation of Ca, P &amp; Mg). Identification of pathologies is supported through practical sessions and on-line materials.</p> <p><b>PATHOLOGY OF THE REPRODUCTIVE SYSTEM:</b> this lecture course looks at the common conditions of the male and female reproductive organs, male accessory sex glands and the mammary glands. Conditions include developmental disorders, hormonal disorders, infection, trauma and neoplasia. Lectures are supported by practical material.</p> <p><b>INFERTILITY AND OBSTETRICS:</b> this course covers causes of infertility and abortion in cattle, sheep, goats, horses, pigs, cats and dogs, including infectious disease. Lectures also deal with diseases and complications of pregnancy/ delivery in the same species; neonatal medicine in companion animals; infertility, pregnancy and common problems in exotic species. Lectures are supported by practical components in years 4, 5 &amp; 6 (Animal Breeding, clinical rotations), case based seminars and on-line materials.</p> <p><b>PIG MEDICINE:</b> this lecture course covers the significant diseases found in pigs in the UK/ Europe, with consideration of both individual (&amp;'pet-pig') and herd health. It includes a review of the pig industry; economically important diseases; diseases of the respiratory, nervous, cardiovascular, haematological systems categorised by congenital, neoplastic, dietary, or infectious origin; polysystemic disease; lameness; GI tract, skin, and urogenital system diseases. The lectures reinforce concepts of herd health, bio-security, &amp; population medicine.</p>

## Overview of Cambridge Veterinary Medicine Course

knowledge of the principles of husbandry, nutrition; pathogenesis, pathology, epidemiology; control of parasitological, microbiological, metabolic and other diseases. The lectures focus on the management of sheep and goats. Supporting on-line material is available to supplement common problems encountered with small ruminant husbandry.

**PRINCIPLES OF INFECTIOUS DISEASES:** this lecture course builds upon BOD (year 2) but with an emphasis on veterinary diseases. The lectures cover common viral, bacterial, parasitological, and fungal infections, as well as prion diseases. Vaccination strategies, newly emerging diseases, diagnosis, biosecurity and containment are considered within context. The roles of vectors in the transmission of disease between animals, and animals and humans, are studied alongside strategies for vector control. Lectures are supported by practical classes demonstrating the common diagnostic tests, identification of parasites, and infected tissue histology.

**PRINCIPLES OF ONCOLOGY:** this course reviews material covered in MIMS and BOD. Lectures include haematological, metabolic and hormonal complications of neoplasia in animals; diagnosis, and staging using biopsies and cytology; treatment regimens including radiotherapy and chemotherapy. Additional, tissue and organ specific neoplasias are discussed within the context of diseases of these tissues during years 4 & 5, and clinical rotations in years 4, 5 & 6.

**ORTHOPAEDIC PATHOLOGY:** lectures cover joint disorders, fractures and repairs, bone conditions arising from dietary, genetic or unknown aetiologies, muscle pathologies, and tumours of bone and connective tissues.

**RADIOGRAPHY & RADIOLOGY:** lectures and demonstrations ensure students can carry out X-ray screening safely; record, assess and interpret an image; understand the uses and limitations of contrast techniques; use ultrasonography. Further aspects are covered in rotations, practicals and lectures in years 5 & 6.

**CLINICAL PHARMACOLOGY:** this course covers pharmacodynamics, pharmacokinetics, routes for drug administration, therapeutic monitoring and drug interactions. These topics are considered with respect to the influence of the disease state on drug choice and dosage. Specific lectures address use of drugs for microbial, fungal, viral and parasitic infections in a veterinary context, including development of drug resistance and alternative management strategies. The legal implications surrounding drug choice are included in the course.

**PRINCIPLES OF ANAESTHESIA:** this course consists of two elements:

- an introduction to the principles of anaesthesia
- applied pharmacology of sedative and anaesthetic drugs, including potential complications.

At the end of the course students will be familiar with the equipment and monitoring of patients; administration and maintenance of anaesthesia; accidents and emergency situations. Lectures are supported by practical sessions to familiarise students with the above. Species specific analgesia and anaesthesia are covered within species specific lectures in years 4 and 5 (*Exotic, Wildlife and Conservation Medicine; Cattle Medicine; Equine Surgery; Small Animal Surgery*).

**PRINCIPLES OF SURGERY:** the lectures cover standard techniques and procedures in an operating theatre, including asepsis, antibiotic usage to prevent infection, haemostasis during surgery, wound healing and management, suture techniques. Practical classes allow students to practice selection of suturing materials and surgical knots.

**VETERINARY PUBLIC HEALTH (VPH):** the lecture series is divided into the following sections:

- State veterinary medicine, population medicine and epidemiology in public health
- Principles and operation of risk analysis
- Veterinary public health and the environment

**SMALL ANIMAL MEDICINE:** this course covers the diagnosis and management of common conditions in dogs and cats; infectious diseases of cats and dogs with vaccination strategies; respiratory, GI tract, liver and pancreatic diseases/ disorders; potential zoonoses; the PETS scheme; importance of correct nutrition in the management of obesity and medical diseases in cats and dogs. Material is supported with on-line learning and clinical rotations in year 6.

**SMALL ANIMAL ORTHOPAEDICS:** this lecture course provides students with the knowledge to recognise, assess, repair and treat different types of fracture in small animals. It covers other common causes of lameness, including musculoskeletal problems relating to genetic or other pathologies, and bone diseases. Lectures complement the practical and clinical rotations in years 5 & 6.

**SMALL ANIMAL SOFT TISSUE SURGERY:** this lecture course addresses surgical anatomy, pathologies requiring surgical intervention, specific surgical indications, basic surgical procedures, and complications of surgical procedures. Systems covered include the urinary, reproductive, gastrointestinal, respiratory, abdominal and integument systems. Specific considerations for small animal anaesthesia, and case based materials are presented.

**EQUINE MEDICINE:** the lectures build upon previous courses, equipping students with the knowledge and competence for clinical rotations in equine medicine. They cover vaccination procedures; neonatal problems; commonly encountered infections of the ear, respiratory and alimentary tracts; colic; parasitology; skin diseases; myopathies and endocrine disorders. Lectures are supported by on-line materials.

**EQUINE ORTHOPAEDICS:** these lectures cover common conditions leading to lameness, with an understanding of the associated clinical, diagnostic and pathological tests essential for constructing an accurate diagnosis and treatment plan.

**EQUINE SURGERY:** lectures introduce the principles of surgical procedures and anaesthesia. Management of common conditions and surgical procedures relating to lacerations, genito-urinary tract, abdomen, respiratory tract, and oesophagus. Situations requiring equine euthanasia are also considered. Practical sessions occur in year 5 rotations.

**PRACTICE MANAGEMENT LECTURES & SEMINARS:** this series of lectures specifically addresses RCVS professional skills and attributes as set out in the day one competencies. Topics include an introduction to the veterinary industry; practice models and financial structures; marketing; HR, team management, safety, legal responsibilities; business planning; performance assessment and planning; ethics.

**INDUCTION FOR FINAL YEAR ROTATIONS:** this course covers ethical and professional obligations for new veterinary graduates; introduces students to the clinical staff who will be meeting them on rotation; introduces standard procedures; advises on personal presentation skills for job application (CVs, interviews); discusses the importance of personal health awareness and where to get support; the role of the Veterinary Defence Society.

**CLINICAL ROTATIONS:** the following rotations are carried out in year 5:

- Consultation Skills – to improve communication in a clinical context, especially when faced with difficult clinical situations
- Equine Studies – covers how the equine hospital works with specific sessions on orthopaedics, equine welfare, cardiology
- Farm Animal Clinical Studies – improves observational skills; assessment of animal husbandry; history taking; basic general examination; safe administration of medicines; safe handling and restraint
- Bovine Obstetrics - to understand presentation of the foetus and common obstetric

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<ul style="list-style-type: none"> <li>• Food safety</li> <li>• Processing of animals for meat production</li> <li>• Regulatory control of zoonotic diseases</li> <li>• Other products of animal origin</li> <li>• Veterinary medicinal products</li> </ul> <p>Lectures are supported by practical classes, including visits to a local abattoir, and food manufacturers.</p> <p><b>CLINICAL ROTATIONS:</b> the following clinical rotations are taken in year 4:</p> <ul style="list-style-type: none"> <li>• Consultation Skills—practice consultation skills appropriate to different clinical situations</li> <li>• Equine Clinical Studies – handling, examination, application of medicines</li> <li>• Exotic Animal Handling And Husbandry – handling, housing, husbandry and welfare. Focus on reptiles.</li> <li>• Farm Animal Clinical Studies - Animal Handling; Applied Husbandry; Elementary Clinical Methods. Focus on cattle and sheep.</li> <li>• Laboratory Animal Management – understand the legal framework; visit a laboratory</li> <li>• Post-Mortem Examinations – observe, undertake a post-mortem, examine tissue histology, prepare a report</li> <li>• Radiography – observe, participate and report on X-ray procedures</li> <li>• RSPCA Clinic, Pool Way – communicating with clients, non-diagnostic procedures</li> <li>• Small Animal Clinical Studies – surgical, nursing and examinations of cats and dogs</li> </ul>	<p>complications; be familiar with techniques used in obstetrics and their practical application; resuscitation; practical partial fetotomy.</p> <ul style="list-style-type: none"> <li>• Bovine Foot Care – to provide students with an understanding of foot care, trimming, lameness factors (and prevention/ control), and general safety aspects.</li> <li>• Gynaecology – to familiarise the student with pregnancy diagnosis and relevant techniques (including AI) in the following species: horses, cattle, sheep, pigs.</li> <li>• Neurology – students visit the neurology unit and are involved in the examination, diagnosis and discussion of cases with the owners present.</li> <li>• Radiography – seminars and case studies alongside practical radiography of normal and abnormal anatomy in different species.</li> <li>• RSPCA Clinic – build on year 4 rotation, with more extensive history taking, development of observational skills, clinical examination, assessment and discussion of treatment plans. Students become more familiar with obtaining client permissions for sample taking, discussion of treatment costs with owners, drug dispensing and labelling protocols.</li> <li>• Veterinary Public Health – a mixture of real-life case study with elements of problem solving followed by presentation of conclusions; review of abattoir material, pathology of specimens and implications for VPH.</li> </ul>
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**CATTLE MEDICINE (1 - yr4):** this course offers an overview of the common health problems and diseases that impact on productivity in cattle. Lectures cover diagnosis, treatment, prevention and control of disease at the level of the individual, group or herd. Topics include vaccination strategies, pharmacological intervention, metabolic and genetic disease as well as infection and toxicology. **(2 - yr5):** these lectures provide additional insight into population medicine, bio-security, and disease accreditation schemes. Students also cover farm animal anaesthesia and those conditions requiring surgery that are commonly encountered in cattle. *(Clinical components are linked to cattle care in rotations.)*

At the end of this course students should have the knowledge to:

- diagnose, treat, prevent and control cattle diseases in the individual, group or herd
- apply concepts of assurance, bio-security and disease accreditation schemes and population medicine

**CLINICAL PATHOLOGY (1 - yr4):** this lecture course covers haematology, leukaemia and lymphomas, and abnormalities of haemostasis. Topics include biochemical and cytological diagnostic testing, bacterial blood cultures, and fine needle biopsies. Practical classes in cytology, haematology and blood-borne parasites support the lectures. **(2 - yr5):** this course links the lectures to practical observation and interpretation of results from blood smear, biopsies and urine samples using analysers, cytology and histology. Practical classes are reinforced with case studies from dogs, cats, rabbits, horses and food animals.

**DENTISTRY (1 – yr4):** lectures review dentition, periodontal disease, tooth decay. Problems specific to cats, rabbits and chinchillas are considered in year 4. Lectures are supplemented with on-line material. **(2 - yr5):** a combination of lectures and practical sessions build on **Dentistry (1)**. Students should be able to provide basic dental care, radiography and surgery. Species focus of the practical: dogs and horses. Supported by on-line materials.

**PATHOLOGY SEMINARS (1- yr4):** these support the understanding of the histological appearance of diseased tissues, and the development of pathology reporting skills. **(2 - yr5):** these are based on practical sessions which allow students to develop skills in identification of histopathological changes and lesions in gross tissues; integrating results with information from clinical history and pathology to interpret, diagnose and propose management strategies; understand the importance of pathology in the context of food hygiene and meat inspection in carcasses of food animals.

## Cambridge year 6

The final year is lecture free, and allows students to concentrate on developing their clinical skills during rotations in equine studies (4 weeks), farm animal (4 weeks), small animal soft tissue surgery (2 weeks), orthopaedic surgery (2 weeks), small animal medicine – including oncology, neurology and clinical pathology (2 x 2 weeks), anaesthesia and peri-operative medicine (2 x 1 week), diagnostic imaging (2 weeks), out-of-hours rotation (2 x 1 week) = a total of 22 weeks' rotations. Additionally, there is an 8 week elective during which students can explore an area of special interest.

## Appendix 4: Clinical Staff in Department of Veterinary Medicine

### Clinical Staff in Department of Veterinary Medicine (at 1<sup>st</sup> December, 2014)

	Qualifications	Job Title
<b>University Teaching Officers</b>		
ARCHER, Joy	VMD, MS, PhD, DipECVCP, FRCPath FRCVS	Senior Lecturer in Clinical Pathology
BREARLEY, Jacqueline	MA, VetMB, PhD, DVA, DipECVAA, MRCA, MRCVS	Senior Lecturer in Veterinary Anaesthesia
CANTACESSI, Cinzia	DVM, MA, PhD, MRCVS	Senior Lecturer in Veterinary Parasitology
CONSTANTINO-CASAS, Fernando	MVZ, PhD, MSMPV, FRCPath	University Pathologist
CORKE, Murray	MA, BVetMed, PhD, MRCVS	Temporary Farm Animal Lecturer
DOBSON, Jane	MA, BVetMed, DVetMed, DipECVIM-CA [IntMed] (Oncol; RadOncol), MRCVS	University Reader in Veterinary Oncology
HUGHES, Katherine	BSc (Hons), BVSc, PhD, FRCPath, MRCVS	University Lecturer in Veterinary Anatomic Pathology
HENSON, Frances	MA, Vet MB, CertES, CertEM, PhD, MRCVS, RCVS Specialist in Equine Surgery	Senior Lecturer in Equine Studies
HERRTAGE, Michael	MA, BVSc, DVSc, DVR, DVD, DSAM, DECVIM, DECVDI, MRCVS	Professor of Small Animal Medicine
HOLDSTOCK, Nicky	BA, MA, VetMB, PhD, CertEM (Stud Med), FHEA, DipECEIM, MRCVS RCVS & European Specialist in Equine Stud Medicine	Senior Lecturer in Equine Medicine and Reproduction
LADLOW, Jane	MA, VetMB, CertSAS, CertVR, DipECVS, MRCVS	Senior Lecturer in Soft Tissue Surgery
HOLMES, Mark	MA, VetMB, PhD, MRCVS	Reader in Microbial Genomes and Veterinary Science

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OWEN, Laura	BVSc, CertSAS, DipECVS MRCVS	Lecturer in Soft Tissue Surgery
McCRONE, Ian	MA, BVSc, MSc, CertCHP, DipABVP(Dairy Practice), DLSHTM, MRCVS	University Physician (Farm Animal)
RADKE, Heidi	DVM, DipECVS, MRCVS	University Surgeon
SKELLY, Barbara	MA, VetMB, PhD, CertSAM, DipACVIM, DipECVIM-CA, MRCVS	University Senior Lecturer in Small Animal Studies
SMITH, Katie	BVetMed, MSc, DipACVS, MRCVS	University Equine Surgeon
WATSON, Penny	MA, VetMD, CertVR, DSAM, DipECVIM, MRCVS, RCVS & European Specialist in Small Animal Medicine	Senior Lecturer in Small Animal Medicine and Clinical Nutrition
WILLIAMS, David	MA, VetMB, PhD, CertVOphthal, CertWEL, FHEA, FRCVS	Associate Lecturer in Veterinary Ophthalmology
WILLIAMS, Alun	BVMS, PhD, DipIECVP, FHEA, MRCVS	Professor of Diagnostic Veterinary Pathology

## Clinical Veterinarians

ARTHURS, Gareth	MA, VetMB, CertVR, CertSAS, DSAS(Orth), PGCertMedEd, FHEA, MRCVS RCVS Recognised Specialist in Small Animal Surgery (Orthopaedics)	Clinical Surgeon
BUTTON, Elinor	VetMB, MA, MRCVS	Junior Clinical Farm Animal Veterinarian
CHEBROUX, Alexandre	DVM, MRCVS	Clinical Veterinarian, Anaesthesia
FORDYCE, Peter	BVetMed, PhD, CertWEL, MRCVS	RSPCA/ Blue Cross Clinician (Part-time)
FREEMAN, Paul	MA, VetMB, CertSAO, DipECVN, MRCVS	Clinical Veterinarian, Neurology
GIULIANIO, Antonio	DVM, MS, PGCert(Cancer Ther), MRCVS	Junior Clinical Veterinarian Oncology
LANGTON, Sean	BVetMed, CertVA, DipECVAA, MRCVS	Clinical Veterinarian, Anaesthesia

## Overview of Cambridge Veterinary Medicine Course

HALL, Jon	MA, VetMB, CertSAS, MRCVS	Small Animal Staff Surgeon
IVES, Edward	MA, VetMB, MRCVS	Clinical Veterinarian, Neurology
MCMILLAN, Matthew	BVM&S, DipECVAA, MRCVS	Clinical Veterinarian, Anaesthesia
O'CONNOR, Avice	MVB, CertAVP(EM), MRCVS	Clinical Veterinarian, First Opinion Equine
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