

**Certificate in Advanced Veterinary Practice**  
**C-SAS.6 Small Animal Surgery**  
**Orthopaedic Surgery A**

**Module Syllabus**



**Module Leader:**

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## Enrolment guidance

This module is one of a range of C modules covering Small Animal Surgery, and is the first of two modules covering Orthopaedic Surgery. The aim of the module is to enable you to extend and consolidate clinical knowledge and skills gained at undergraduate level, and to develop an in-depth understanding of the application of that knowledge in a practice environment in relation to Orthopaedic Surgery in the areas as outlined below.

You must fulfil the following criteria:

- a) You should have completed module B-SAP.1.
- b) If you are only enrolling for the C surgery modules with RVC, it is **highly recommended** that you complete the assessment task relevant to surgical principles in module B-SAP.1. This will be reviewed by the assessors prior to assessment of any C module work. If you have completed the B-SAP.1 module at another institution, your surgery report may be submitted for feedback.
- c) You are **strongly recommended** to take the 'core' Surgery module – Small Animal Surgical Practice (C-SAS.1) – before attempting this module. Whilst this module may be taken as a free-standing module, it assumes a sound understanding of the principles covered within C-SAS.1.
- d) It is your responsibility to ensure that you have access to sufficient surgical cases to produce adequate material for the module.
- e) It is your responsibility to be aware of the limitations of your facilities to carry out surgical techniques that might be taught in the course of this module.

Coverage of this module may be integrated with others, particularly other B and C modules. You will normally have completed A-FAVP.1 Foundations in Advanced Veterinary Practice module and at least one of the practice B modules, before undertaking a C module, although you can choose to work through modules in a different order if you wish. In whichever order modules are tackled, compliance with best practice for all the topics covered by module A-FAVP.1 will be expected whenever these are appropriate in C modules. For example, awareness of, and compliance with, all relevant legislation, welfare and ethical principles will be required throughout.

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undergraduate level, and to develop an in-depth understanding of the application of that knowledge in a practice environment.

You are advised to plan a structured programme of continuing professional development to help you achieve your objectives. Involvement in 'learning sets' and networks of other candidates working towards the same or similar modules is encouraged; this could be initiated by the candidates themselves via RVC Learn. The RCVS considers that candidates will need advisers/mentors to support them through the programme. You are free to choose your own advisers/mentors and the RCVS guidelines strongly advise you to seek advice from your mentor regarding 'seeing practice' with specialist surgeons.

For a designated Certificate in Advanced Veterinary Practice (General Small Animal Surgery) you must complete this module, the C-SAS.1 Core module, a third surgery module, a fourth 10 credit module of your choice and an RCVS synoptic assessment.

## Learning outcomes

This module will enable the candidate to

- Gain a sound understanding of the principles of tissue healing and the physiological consequences of surgery on all body systems.
- Critically appraise their current working practices with regard to preparation and management of the surgical patient, the surgical environment, staff and instruments.
- Use the information gained in this module to modify their working practices and upgrade to 'best practice' techniques.
- Recognise the moral responsibility to provide adequate levels of care and facilities for particular surgical procedures.

## Module objectives

At the end of the module, you should be able to:

- Thoroughly understand the anatomical, physiological, immunological and pathological processes involved in surgical disease, including the relationships between surgery and the overall health status of the patient. Understand the pathophysiological responses to trauma including surgical trauma
- Show thorough familiarity with the clinical presentation of the common surgical conditions affecting dogs, cats and small mammals
- Understand and promote concepts of best practice in relation to asepsis, preparation of theatre, personnel and patient for surgery. Understand strategies available for managing intra-operative contamination
- Understand and promote best practice in post surgical nursing, including all aspects of recovery, nutrition and post operative rehabilitation
- Understand and communicate rational choice and use of antibiotic therapy in relation to surgical cases
- Identify surgical equipment and know how to package, sterilise and maintain surgical instrumentation and equipment
- Review and constructively criticise current literature on surgical principles, theatre practice and post surgical nursing, to enable them to determine its relevance to their current practice

- Utilise their understanding of Evidence Based Medicine and Decision Analysis to develop practical diagnostic and treatment protocols for their patients
- Use available resources and communicate with owners in such a way as to achieve optimum results in their practice circumstances in relation to surgical cases
- Review the outcomes of at least part of their clinical work, using the process of clinical audit to improve performance
- Recognise when a case is truly unusual, and become familiar with the information resources available to enable them to deal with such cases
- Recognise when a case is beyond their personal or practice capabilities, and provide an effective channel of referral
- Understand and recognise the moral responsibility for advising owners when they are inexperienced with a particular type of surgery
- Appreciate the importance of adequate facilities and skill necessary for advanced surgery

## Learning topics

The areas to be covered should include the following:

### 1. Bone biology

- Understanding of biology of normal and diseased bone and fracture healing processes
- Understanding of basic biomechanics of bone and fracture repair

### 2. Fracture management

You should be familiar with the commonly performed surgical approaches to the humerus, radius and ulna, femur, tibia, and pelvis

- Pre-operative assessment of trauma patient and recognition and treatment of associated injuries including provision of analgesia
- Pre-operative fracture planning
- Surgical anatomy
- Understanding of AO/ASIF principles
- Biological osteosynthesis and principles of this approach to fracture repair
- Thorough knowledge of fracture stabilisation techniques to include the uses and limitations of:
  - Casts and splints
  - Bone plating (compression, neutralisation, buttress), plate rod combinations and locking plates
  - Pin and cerclage wire
  - External skeletal fixation (advantages and disadvantages of different systems available)
  - Circular skeletal fixators and Ilizarov principles
  - Interlocking nails
- Management of fractures of fore- and hindlimbs, skull, spine and pelvis (A list of fractures that the candidate should be capable of performing is detailed separately. You should be familiar with the principles of management of the technically more demanding fractures where practical experience is not expected.)
- Special considerations applicable to articular and open fractures (You should be familiar with the management options for articular fractures, complications of these

injuries and how these complications can be managed. You should be familiar with the classification of open fractures).

- Classification and treatment of fractures involving growth plates in immature animals, and the potential complications of growth plate injuries and their management
- Post-operative management to include the role of physiotherapy and an understanding of the more commonly used techniques used by physiotherapists to manage orthopaedic disorders

### **3. Complications of fracture management**

- Fracture disease - understanding the pathological processes involved and how to treat it
- The management of quadriceps contracture
- Understanding the pathogenesis and treatment of delayed, mal- and non-union
- The classification of non-unions
- Management of osteomyelitis

### **4. Pathogenesis and management of angular limb deformities**

You should be familiar with the aetiology and treatment options for angular limb deformities of the forelimb (carpal valgus/varus) and hindlimb (genu valgum, pes varus).

### **5. Metabolic bone disease**

Aetiology, pathogenesis and treatment of:

- Craniomandibular osteopathy
- Metaphyseal osteopathy (or hypertrophic osteodystrophy)
- Hypertrophic (pulmonary) osteopathy
- Nutritional bone disorders
- Panosteitis

(A detailed understanding of the pathology of these diseases is not expected.)

### **6. Bone tumours**

Biology, diagnosis and treatment options for osteosarcoma, and other malignant bone tumours and their treatment

## 7. Surgical Procedures

Whilst certain procedures are undeniably within the remit of the Certificate level surgical modules, for example simple fracture repair, others such as joint arthroscopy or total hip replacement are equally clearly outside the scope at this level. However, many procedures lie in a grey area between the obvious extremes and furthermore it is not unreasonable to expect candidates following the surgical route to have knowledge of even the most complex procedures. Otherwise, proper case selection and appropriate referral cannot take place. Furthermore, to restrict Certificate level surgeons to a limited number of specified procedures would risk producing Certificate holders who would be little more than surgical technicians with a limited repertoire.

A wide range of procedures is therefore listed below, and these have been classified to indicate the level of competence which you would be expected to have acquired on completion of the orthopaedic surgical modules. A similar list is provided for the soft tissue surgery modules.

- A.** These are procedures in which the candidate should be fully competent. The candidates should be able to execute the procedure to a standard comparable with any other surgeon and be able to demonstrate complete understanding of indications, limitations, alternative techniques, complications, prognosis, etc.
- B.** These are more challenging procedures which, by the time the candidate sits and passes the surgical modules, they will be expected to perform competently. Such procedures will be those requiring a more confident, experienced surgeon and a more detailed knowledge and understanding of surgical science in general and the specific details and background of the technique and the underlying disease processes. As before, the candidate must be able to demonstrate a complete understanding of indications, limitations, alternative technique, complications, prognosis, etc.
- C.** These are complex and advanced techniques which are usually performed by surgeons with significant postgraduate surgical experience and training. Certificate level candidates will not be expected to demonstrate experience or competence in these techniques. However, you will be expected to demonstrate an understanding of indications, limitations, alternative techniques, complications



and prognosis, sufficient to advise clients and select appropriate cases for referral.

<b>Humerus</b>	Simple diaphyseal	A
	Comminuted diaphyseal	C
	Severely comminuted diaphyseal	C
	Lateral Condylar	B
	T/Y # of Condyles	C
<b>Antebrachium</b>	Simple diaphyseal	A
	Comminuted diaphyseal	B
	Severely comminuted diaphyseal	C
<b>Carpus</b>	Radial carpal	B
	Accessory carpal	B/C
	Metacarpals/Phalanges	A/B
	(Racing dogs, etc)	B/C
<b>Femur</b>	Femur Simple diaphyseal	A
	Comminuted diaphyseal	B
	Severely comminuted diaphyseal	B/C
	Capital physeal separation	B
	Distal physeal fracture	A/B
<b>Tibia</b>	Tibial Crest Avulsion	A
	Simple diaphyseal	A
	Comminuted diaphyseal	B
	Severely comminuted diaphyseal	B/C

	Distal (Malleolar) Fracture	B
<b>Tarsals</b>	Central Tarsal	B/C
	Multiple Tarsal	B/C
<b>Metatarsal</b>	Metatarsal	A/B
	(Racing dogs)	B
<b>Spinal</b>	Spinal fractures	C
<b>Pelvis</b>	Pelvic fractures	B/C
<b>General</b>	Open fractures	B/C
	Articular fractures	B/C
	Angular limb deformities	C
<b>Spinal surgery</b>	Atlantoaxial stabilisation/fusion	C
	Ventral Disc Fenestration	C
	Ventral Slot Decompression	C
	Distraction Fusion for CCSM	C
	Conventional Fracture Management	C
	Thoracolumbar disc fenestration	C
	Decompressive T/L hemilaminectomy	C
	T/L Fracture Management	C
	Dorsal Lumbosacral Laminectomy	B
	Lumbosacral Distraction Fusion	C
Lumbar or L/S Fracture Management	C	



## Assessment

- A case diary of 20 **fracture** specific surgical cases relating to the subject matter covered under Small Animal Orthopaedic Surgery A should be submitted. These cases can be taken from the 100 consecutive surgical cases submitted as part of the Small Animal Surgery (Core) module.
- A 1,500 word synopsis to accompany the case diary will enable you to review the improvement in their practise while accumulating these cases. This might include what has changed in their approach to a case, any new procedures or investigations that are now considered, any additional reading which was helpful, and/or any unexpected features of a case which will influence decision making in the future.
- Candidate to then select up to 5 cases they wish to expand on, with a paragraph per case stating their reason for each choice. Each case must have complete case history and follow up, including, where applicable, laboratory results and pre- and postoperative imaging. Fractures must be followed up with radiographic evidence of bony union or to the point of identification of failure of fracture fixation. The assessor will select 2 cases to be written up by the candidate. The candidate must be primary surgeon for all 5 cases.
- Two cases to be written up in detail up to 2,000 words in length with appropriate illustrations. The discussion in these two case reports will critically appraise the case management and demonstrate the candidate's ability to apply the learning outcomes to the management of cases in their practice. **The discussion should be very specific to the surgical case.** It should be based around discussing what went well and what went badly with the surgery. The discussion should also critically review the wider literature relating to the surgery case. In some cases this may involve discussing alternative treatment/management options based on the current literature. Proper and appropriate referencing is expected. A useful guideline is that the discussion should comprise approximately half of the word limit (i.e. 1,000 words).
- One case report can be submitted for review prior to being marked. This is only permitted once per candidate per discipline. It must be submitted as a fully written report and not a draft version. Feedback will be given on the approach to writing the

case report that can be applied to all future surgery reports and modules, rather than specific comments on management of the individual case.

- A one hour examination to consist of 10 short answer questions relating to the subject matter covered under Small Animal Orthopaedic Surgery A.

### **Assessment weighting**

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|----------------------------|-----|
| • Case diary with synopsis | 10% |
| • Case reports             | 60% |
| • Exam                     | 30% |

## Annual assessment timetable

<b>1<sup>st</sup> September</b>	Please inform the CertAVP office if you are intending on submitting work in October
<b>1<sup>st</sup> October</b>	Case diaries and synopsis to be submitted and accompanying this should be a separate document with the choices of 5 cases you wish to expand on.
<b>16<sup>th</sup> November</b>	You will be notified of your case diary and synopsis results. If successful, you will be notified of which 2 cases are to be written as case reports
<b>15<sup>th</sup> January</b>	You are given the opportunity to have one case report per discipline reviewed prior to marking (therefore only one for all Surgery modules). Please submit your report by this date if you haven't already had a review.
<b>22<sup>nd</sup> February</b>	Case report feedback returned to you
<b>1<sup>st</sup> April</b>	Two case reports to be submitted
<b>15<sup>th</sup> June</b>	You will be notified of your case report results
<b>Early July</b>	Written examination to be held (date to be confirmed)
<b>Early September</b>	You will be notified of their exam result and module pass

*Where possible, failed work can be re-submitted within an agreed timeframe, rather than waiting for the next assessment cycle.*

## Learning support

Learning support is provided to aid self-directed learning and to provide easy access to published articles. You will be given a username and password which will allow you to log on to 4 different systems:

### 1. RVC Learn (<http://learn.rvc.ac.uk/>)

- Sample reports for each surgery module
- Practice exam questions
- A very helpful webinar to guide you through the assessment requirements
- Interesting articles to read
- Access to presentations from the CertAVP Induction Day
- Discussion boards between other candidates enrolled on the module and with surgery tutors
- Guidelines for mentors
- Access to SCOUT, RVC's solution for the discovery and delivery of resources including books, ebooks, journal articles and digital objects, all in one single search. Log in to SCOUT using your RVC username and password to save items on your eshelf. If you are able to use the library in person, you can borrow a book for one week with photo ID. IT and Library support is available for this facility (email [library@rvc.ac.uk](mailto:library@rvc.ac.uk) or [helpdesk@rvc.ac.uk](mailto:helpdesk@rvc.ac.uk)).

### 2. RVC Intranet (<https://intranet.rvc.ac.uk>)

Access to all information available to all RVC students and employees, for example, news, events, policies, committees, services, Library, IT helpdesk, etc.

### 3. Athens (<http://www.openathens.net/>)

A huge amount of any library's information is now available online, e.g. electronic journals, e-books and databases. 'Athens' is a system used by UK universities for controlling access to these type of online services and with your username and password, you can access many of a library's online databases, electronic journals and e-books seamlessly.

### 4. Email (<http://mail.rvc.ac.uk>)

You are given an RVC email address, which is **compulsory** to use for CertAVP communication and submission of work.

## Case diary guidelines

A case diary template is available on Learn. Include a variety of surgeries and no more than 10% of cases should be listed as second surgeon. To maintain this variety, please stop including surgeries after 25% of the same of any one type has been reached (e.g. no more than 25% TPLO surgeries for the treatment of cruciate disease). This equates to 5 surgeries in C-SAS.6 and C-SAS.7 modules.

No more than 10% (2 cases) should list you as the assistant (second) surgeon. In cases where you are the primary surgeon but someone else is listed as an assistant surgeon please clarify in the synopsis who they are (e.g. nurse, colleague, mentor) and whether they are simply assisting with retraction and passing of instruments or to what extent they were involved in performing the surgery.

Cases can be collected from up to 12 months prior to the date of enrolment on the CertAVP programme.

Make sure you only include cases that relate to the syllabus content for the module (fractures), which VARY for each module.

Do not include implant removal such as External Skeletal Fixators (ESF) or pin removal.

Brief description is necessary for orthopaedic cases including implants used – it is not enough just to say “bone plate” or “cruciate surgery”. For example, state: spiral tibial fracture with minimal displacement; stabilised with 9-hole 3.5mm DCP and two lag screws. You must be accurate with the description of screw sizes, measurements, etc.

Do not include the following in any C module case diaries:

- Routine neutering procedures
- Routine dew claw removal
- Routine uncomplicated/small umbilical hernias corrected at the same time as neutering
- Chest drains
- Skin biopsies
- Lance abscess
- Critical care procedures e.g. O-tube placement



- Simple wedge biopsies from masses
- Suturing of small or simple skin wounds
- Simple implant removal e.g. K-wire removal
- ESF removal
- Non surgical cases (i.e. septic arthritis managed medically)

You may use well-known abbreviations as long as these are explained in an appendix.

### **Case diary synopsis**

A 1,500 word synopsis essay is required to accompany the case diary. This synopsis might include:

- discussion of what might have changed in your approach to a new case
- any new procedures or investigations that are now considered during case investigations
- any unexpected features of a case which might influence decision making or case management in the future
- discuss whether there has been any impact on you and your team for future practice and learning
- any additional reading which was helpful

This is a good opportunity to explain or clarify any aspects of your case diary to the examiner and to state any plans you have for future study. Wherever appropriate use your further reading and available evidence to support any statements that you make. Examples of reflective essays are provided on Learn although please note that there is not a specific format that must be followed. You must stay within the word limit given or the work will be returned unmarked.

## Case report guidelines

The case reports should be in Word and the content of reports must be anonymous, e.g. removing practice details from discharge notes.

Each case report is to be written up in detail up to 2,000 words in length with appropriate illustrations. We require that you to include radiographic views of the fractures in their reports, pre and postoperative, as this would allow the reviewer to better evaluate the quality of the reports. Two radiographic projections of the fracture and repair need to be included. Photographic illustrations of procedures must be clear, unambiguous and labelled to enable orientation for the reviewer. All tables, figures, photographs and radiographs must be accompanied by a figure legend, which is referred to in the main text in brackets, e.g. (Figure 1) but interpretation must be included within the body of the text and is included in the word count. For radiographs lateral views of any part should be orientated with the cranial or rostral part to the viewer's left. Ventrodorsal and dorsoventral images should be viewed with the left side on the viewer's right. Images of the distal limbs should have the proximal portion at the top of the image. Lateral and medial should be consistent throughout the report. For ultrasound images cranial should be to the left with ventral surface at the top of the image. Please ensure digital images are submitted in a compressed format so that they can be easily transferred via e-mail. Images are not essential to pass a case report but they increase the quality of the report.

The case report should be written in the third person in a style suitable for publication in a Journal (for example Journal of Small Animal Practice). You are expected to demonstrate a high standard of literacy and please ensure that any spelling and grammatical errors have been corrected.

The following frame work should be used as a guide to the structure of the case report:

- Identification of patient
- History
- Clinical signs
- Problem list and differential diagnoses
- Investigation
- Diagnosis
- Discussion of management options with the clients
- Treatment (including postoperative care/instructions)

- Follow up
- Result
- Discussion
- References
- Appendices (optional)

### References:

- These should be properly cited in the text, in accordance with the style in the Journal of Small Animal Practice (JSAP). Avoid listing references that were not cited in the text or vice versa.
- We recommend using Harvard referencing as described by the Anglia-Ruskin University (<http://libweb.anglia.ac.uk/referencing/harvard.htm>).
- You will find it very helpful to use a program such as Endnote® or Reference manager® to organise your references.

### Appendices:

- You may include appendices to provide laboratory reports or other information that the candidate may wish the examiner to have access to but please note that the examiners are not obliged to read them (so please don't include essential case information).
- The appendices may not be used to provide additional information that should be within the case report e.g. justification for use of antibiotics. Any such information will not be marked and will not contribute to the overall grade.
- Images may be included here or in the main body of text. Please include at least the preoperative and postoperative radiographs of the fractured bone. Include any images that you think are relevant as these generally enhance your report and enable examiners to assess your interpretation. Normal ultrasound images need not be included unless you would like to do so but clear abnormal images should be included if possible. Radiographs must be interpreted within the text of the case report and not as part of the figure legends or within the appendices.
- Laboratory reports may be included here but all abnormalities need to be written in the text and reference ranges must be included. All laboratory results should be interpreted appropriately within the text of the case report and not within the appendices.
- It is acceptable to scan printed reports rather than re-type them if you prefer, but any case details or details of your name or practice must be blanked out.

The word limit is 2,000 words per case report. Tables, figure legends (including descriptions of radiographs), appendices and reference list are NOT included in the word count. The report title and titles within the report ARE included. You should not put important information, such as the physical examination, in to a table to avoid the word count; only numerical data should appear within a table (such as laboratory results). In the interests of fairness to all candidates the word count is adhered to strictly and reports that exceed it will be returned unmarked.

## Instructions for submitting work

Each piece of work you submit must be anonymous and please ensure that your written work includes this table on the front page (not needed for the case diary):

<b>Student number:</b>	
<b>Module:</b>	C-SAS.6
<b>Piece of work:</b>	<i>case diary synopsis, case report 1, case report 2 etc</i>
<b>Word count:</b>	

Contact the CertAVP office if you need a reminder of your student number (found on your Rover/Student Records email when you first enrolled). All work is submitted online via Learn; you will be given further instructions when you enrol.

The case diary should be written in Excel (with your student number in the heading or in the first cell) and organised in such a way that it can be easily viewed on one page/screen in landscape view. The synopsis, case reports and essay should be in Word.

The content of case reports must also be anonymous, e.g., removing practice details from discharge notes or laboratory reports.

All written work submitted to the Royal Veterinary College is passed through plagiarism detection software. Work submitted for this module should not have been submitted for any other courses at RVC or other institutions.

These submissions should be retained by you as you may need to be referred to again as part of a final RCVS synoptic assessment for the full Certificate qualification.

## Mentors

Candidates who study for the CertAVP surgery C modules with the Royal Veterinary College are advised to find a mentor who can guide them. Finding a mentor and maintaining appropriate and regular contact are the responsibility of the candidate, and mentors operate on a goodwill basis only. Mentors are usually either holders of the RCVS CertSAS or RCVS CertAVP qualifications or holders of American, European or RCVS Diploma qualifications. Ideally mentors will have some experience of teaching and examining at either undergraduate or post-graduate level. Members of the RVC Small Animal Surgery department cannot act as mentors as they are involved in setting and marking the assessed work. We recommend that an individual mentor does not take on more than 5 CertAVP candidates if possible.

We consider that the role of a mentor should/may include:

- Becoming familiar with the module outlines that are supplied to candidates.
- Encouraging candidates to undertake continuing professional development and to 'see practice' at a relevant centre/s appropriate to their strengths and weaknesses.
- Encourage candidates to join relevant societies and associations and attend meetings where appropriate.
- Guide candidates on the level and amount of reading that they should be doing during their period of study. There is a reading list for each C-SAS module which can be used as a framework.
- Encourage candidates to plan their time carefully for logging cases, writing case reports and essays, reading and exam preparation. A reminder of good examination technique may also be useful for some candidates.
- Encourage candidates to get support from other CertAVP candidates either through the RVC learning support discussion forums or by other means.

### What is the mentor's role regarding submitted work?

We consider that a mentor can give general advice on preparation of a case diary and selection of cases for writing up into full length reports. Unlike the previous RCVS CertSAS we do not recommend that mentors read any of the case reports in detail and/or give

detailed written advice. However, one read through of one case report and some general feedback (ideally verbally) is acceptable. Please notify the CertAVP office when you have a mentor as there is a Mentor Guidance document that is provided to them.

### Suggested reading list

The following list is given as a guide as to where to start and for this reason cannot be considered 'complete'. We also don't expect you to read texts from cover to cover or to use all of the texts listed, however we do recommend you make use of the most recent edition of textbooks where available. We apologise if you feel a particular favourite is missing - feel free to use the Learn discussion board to pass on additional suggestions to other candidates.

- Veterinary Small Animal Surgery, Volumes 1 and 2: Ed. Tobias and Johnston, Elsevier Saunders (2012)
- BSAVA manuals of surgery
- Manual of Small Animal Orthopaedics and Fracture management: Brinker, Piermattei and Flo
- Johnson AL, Houlton JE, Vannini R. AO principles of fracture management in the dog and cat. AO Pub.; 2005 May 25.
- Montavon PM, Voss K, Langley-Hobbs SJ. Feline orthopedic surgery and musculoskeletal disease. Elsevier Health Sciences; 2009 Jul 14.
- Scott H, Marti JM, Witte P. Feline orthopaedics. CRC Press; 2007.
- Compendium of Continuing Education
- Journal of Small Animal Practice
- Veterinary Surgery