

A comparison of the surgical caseloads of selected companion animal hospitals and a veterinary academic hospital in South Africa

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ABSTRACT

Educational institutions should be aware of the frequency of surgical procedures in private practice, to assist both the student and the lecturer in evaluating the relative importance of procedures and to structure training programmes accordingly. The surgical caseload for 1 year at a veterinary academic hospital and 13 private companion animal hospitals registered with the South African Veterinary Council were compared. Surgical records were entered into a spreadsheet and sorted according to 96 selected surgical procedures to facilitate comparisons. Surgical procedures were in turn grouped according to date, species, degree of difficulty and frequency of occurrence. Feline procedures were more commonly performed in private hospitals. The academic hospital's caseload was dominated by major and advanced procedures while the private hospitals carried out more minor procedures. At the private hospitals more general surgery, and ear, nose and throat surgery as well as dental procedures were performed, while at the academic hospital more ophthalmic, orthopaedic, thoracic and neurosurgical procedures were carried out. The most commonly performed procedures at the academic hospital differed from those at the private hospitals. No seasonal trends were evident.

Key words: companion animals, private veterinary hospitals, student training, surgical procedures, veterinary teaching hospital.

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dures from surgical categories was developed by Johnson *et al.*⁵ at the University of Illinois. Veterinarians in private practice were asked to select the frequencies of procedures in their hospitals and the required proficiency of new graduates with regard to each procedure. In addition, each participant also had to list the 10 most important procedures in which graduates should be proficient. These procedures may or may not have been included in the 70 selected procedures listed on the last page of the questionnaire, and this served as a control to ensure that less important procedures were not omitted. In total, 194 procedures were included in the lists of the top ten procedures. Only 8 procedures were performed more than once a month and these were not affected by type, location, or kind of practice.

South Africa has a growing core of pet owners, with an ever-increasing demand for minor to major surgical interventions. In a study entitled 'SA Focus – Consumers in South Africa'², 7999 households interviewed during late 1996/early 1997, were classified by province, housing type, metropolitan, other urban and rural areas, and by population group. Rural pet owners owned more dogs (85 %), cats (28 %), birds (22 %) and other pets (12 %) than owners in metropolitan areas, who owned dogs (69 %), cats (24 %), birds (18 %) and other pets (9 %). In rural areas, 12 % of whites did not own pets as opposed to 22 % in metropolitan areas.

MATERIALS AND METHODS

Data were acquired from two sources, covering the period January to December 1990. First, from archived files in the Section of Small Animal Surgery, Department of Surgery, Onderstepoort Veterinary Academic Hospital (OVAH), Faculty of Veterinary Science, University of Pretoria, and, second, from Vet-OM (Veterinary Office Manager, Johannesburg) files of 13 private hospitals registered with the South African Veterinary Council. Nine of the private hospitals were in Gauteng, 3 in the Cape Province and 1 in Kwa-Zulu-Natal. Two practices had specialist surgeons. The remaining 11 practices

INTRODUCTION

The purpose of this study was to compare the frequency of surgical procedures in private practice with that of an academic hospital, and to develop guidelines regarding what veterinary students who intend moving into private practice 'need to know', *vis-à-vis* information that is 'nice to know'. Such information may be of use in the structuring of surgical courses, and should ideally be obtained from members of the veterinary profession who are in private practice.⁵ It is interesting to note that graduating veterinary students at the University of Illinois³ accurately predicted the surgical procedures that they would be performing regularly in private practice.

Specialist status should be available to all those practitioners who seek such recognition. Modern education must be flexible enough to create opportunities for practitioners

to do postgraduate studies, and a modular approach will be helpful to achieve this⁸.

To increase awareness of the differences and similarities between private and academic surgical practices, Vasseur *et al.*⁷ evaluated the volume and distribution of surgical cases in 78 companion animal hospitals in California and compared them with the surgical caseload of the Veterinary Medical Teaching Hospital (VMTH) of the University of California at Davis. At VMTH, soft-tissue procedures dominated the caseload (74 %), followed by dental (12 %), orthopaedic (9 %) and other procedures (<5 % per category).

In a survey of procedures carried out in 42 companion animal practices in Perth (Australia)¹, 11 were found to perform intraocular surgery. This number was unexpectedly high but no explanation was given. Most practices performed cruciate ligament reconstruction on dogs. Elbow and shoulder surgery was less commonly performed, suggesting either difficulty in diagnosis, lack of training in that field, or low incidence. Ten practices carried out spinal laminectomies.

A questionnaire listing selected proce-

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Minor surgery:	Wound management surgical and non-surgical, biopsies, abscesses, tail docking/dewclaw removal, dewclaw removal (adult), tumour or cyst excision, external ear surgery, nail removal, implant removal, electrocautery wound/tumour, rectal or anal surgery, dewclaw removal (pup), beak/wing clipping, foreign body removal, pharyngotomy/ostomy, cryotherapy, hernias, nasal surgery, onychectomy, dental extractions.
Neutering procedures:	Ovariohysterectomies, orchidectomy.
Major procedures:	Cruciate rupture repair, arthrotomy, patella luxation, femur head excision, pinning, pectineal tenotomy.
Advanced procedures:	Arthrodesis, triple pelvic osteotomy, fractures advanced or requiring plating, neurosurgery.

Fig 1: Examples of minor, neutering, major and advanced surgical procedures in the Onderstepoort Veterinary Academic Hospital and 13 selected private veterinary hospitals over a 1-year period.

consisted of general practitioners and varied from single to 6-man-practices. These practices were selected as they all used Vet-OM, a comprehensive practice management software package from which data could be readily extracted.

OVAH data were extracted first, to act as a classification against which the other data could be compared. The data were entered into a spreadsheet and processed in SAS (SAS Institute South Africa, Parklands, South Africa).

After individually sorting the university and private practice files, a listing of each produced 231 and 320 procedures, respectively. Only 127 procedures were common to both data sets. There were 104 and 193 procedures unique to the university and the private veterinary hospitals, respectively. To limit loss detail with regard to individual procedures, all data ($n = 424$) were re-coded into broader categories of 96 surgical procedures, thus rendering the OVAH and private practice procedures directly comparable. SAS frequency tables were used to check the integrity of the OVAH data, and the list was then used re-classify the private practice data, also according to species, namely canine, feline and exotic patients.

The Vet-OM private practice files were cleared of irrelevant data, namely injections, medication and non-surgical procedures by line deletion, and checked for integrity using SAS. A data list for each practice was then created to render it comparable to the classification of OVAH procedures.

Each surgical procedure was then given a frequency rating. This figure was divided by 12 to give a monthly frequency rating. The procedures were then listed from most to least frequently performed and represented as a percentage of the total. Frequency ratings were generated for OVAH and the private hospitals. The data were also sorted according to their

rating as minor, neutering, major and advanced procedures.

RESULTS

A comparison of minor, sterilisation, major and advanced surgical cases between OVAH and the private hospitals is presented in Fig. 1.

All the procedures that were performed more than once a month in private hospitals appeared in the OVAH procedure list, albeit at different frequencies except for abscess management, tail docking and coeliotomies.

A comparison of procedure frequencies between OVAH and the private hospitals is presented in Table 1.

The private hospitals saw on average 1288 minor surgical cases per year *vs* 502 minor surgical cases at OVAH. The average number of neutering procedures in dogs and cats at OVAH was comparable to that of the private hospitals (665 *vs* 639, respectively). OVAH saw relatively more major surgical procedures than the private hospitals (518 *vs* an average of 124 cases per year), and also more advanced surgical procedures than in the private hospitals (302 *vs* an average of 20 cases per year).

DISCUSSION

Factors that may have affected the caseloads should be considered when interpreting the results of this study. OVAH's caseload was characterised by more major and advanced cases, receiving 64 % of cases ($n = 1592$) from the surrounding area as well as 36 % ($n = 897$) referred cases. The fields of interest of staff members may also have influenced the caseload⁴. The private hospitals had more minor cases. Neutering caseloads were similar. Minor surgical procedures that were performed in other sections of OVAH, such as the Outpatients Section were not included in this study, and this is

likely to have resulted in an underestimation of the number of minor surgical procedures. This also explains why theriogenological procedures, such as caesarean section, do not feature in this study.

OVAH saw 91 % canine and 9 % feline cases, while the incidence at the private hospitals was 74 % and 26 %, respectively. The private hospitals are in metropolitan areas while the university hospital is in a semi-urban area, and the fewer cats admitted to OVAH may be related to this difference in location.

The annual caseloads of OVAH and the private hospitals were comparable ($n = 2489$ *vs* on average 2263, respectively, per annum). Differences are apparent between OVAH and the private hospitals in species distribution, degree of difficulty, body system involved and frequency of procedures.

At VMTH (California), 235 surgical cases per month were treated compared to 65 cases per month at private hospitals. The corresponding figures for OVAH and local private practices were 207 and 173, respectively. The reasons why the private South African practices performed more surgical procedures per month than those in the USA, may have included the repeated recording of, for example, the same wound being cleaned during several follow up visits. Non-surgical wound management was not recorded as surgical procedures by Vasseur *et al.*⁷ A factor that may affect surgical caseload numbers are leash and firearm laws, which may be less strict in South Africa, resulting in greater numbers of wound management and orthopaedic cases due to dog fights and gunshot wounds.

In the study by Vasseur *et al.*,⁷ soft-tissue procedures accounted for 74 % of the caseload in private hospitals and 70 % at VMTH, while they accounted for 87 % in the private hospitals in South Africa and 65 % at OVAH. Cryosurgery and cosmetic

Table 1: Procedure frequencies in the Onderstepoort Veterinary Academic Hospital (OVAH) and private hospitals.

OVAH		Private hospitals	
Procedure	Percentage	Procedure	Percentage
Spay	42.16	Spay	37.24
Fracture appendicular skeleton	30.00	Wound management – non-surgical	27.26
Castration	19.75	Wound management – surgical	18.45
Extraocular surgery	13.41	Routine periodontal treatment and extractions	16.31
Wound management – non-surgical	10.33	Castration	15.60
Wound management – surgical	9.08	External ear surgery	12.74
Cruciate rupture repair	6.50	Tumour/cyst excision	8.76
Biopsy	5.75	Abscess	8.69
Spinal decompression	5.25	Fracture appendicular skeleton	4.25
Intraocular surgery	5.08	Biopsy	3.41
Hernia	5.08	Extraocular surgery	2.47
Routine periodontal treatment and extractions	4.08	Cruciate rupture repair	1.73
Arthrotomy	3.25	Tail docking/dewclaw	1.64
Patella luxation	3.25	Hernia	1.24
Femur head excision	3.16	Coeliotomy	1.01
External ear surgery	3.16	Dewclaw removal – adult	0.82
Tumour/cyst excision	3.08	Amputation tail	0.75
Cage rest	2.66	Beak/wing clipping	0.71
Implant removal	2.50	Femur head excision	0.66
Endodontics	2.33	Nail removal	0.57
Fracture axial skeleton	2.25	Fracture axial skeleton	0.50
Arthrodesis	2.08	Patella luxation	0.49
Intrathoracic surgery	1.67	Arthrotomy	0.48
Rectal/anal surgery	1.50	Implant removal	0.47
Salivary gland surgery	1.00	Electrocautery tumour/wound	0.42

procedures were recorded as specific categories by Vasseur *et al.*⁷ but were included in general surgery in this study. The fact that private hospitals in this study seemed to do more general surgery (38 % *vs* 13 %), and ear, nose and throat surgery (7 % *vs* 3 %) than OVAH, should be viewed in the light of the preceding discussion on how data were recorded. The private hospitals in this study performed more dental procedures (9 % *vs* 3 %), while OVAH did more ophthalmic (12 % *vs* 1 %) and orthopaedic (25 % *vs* 6 %) and neurosurgery (5 % *vs* 1 %) procedures. The OVAH and private hospitals' urogenital caseloads were similar.

Ophthalmic, orthopaedic, thoracic and neurosurgery procedures are subject to referral owing to their advanced nature, but OVAH still saw many more advanced cases in these categories than the 2 private practices that employed specialist surgeons. OVAH had well-established dental, ophthalmology and spinal unit clinics in these fields of specialisation. Fields of specialisation seem to be determined not only by larger caseloads, but also by the expertise and level of specialisation of staff members.

External ear surgery in the uncoded data included mainly ear cleaning and examination, as well as othaematoma correction and to a lesser extent ear cropping, ear canal resection and the Zepp's procedure. For ethical reasons, ear cropping is not carried out at OVAH. External ear surgeries were performed 7 times per

month at OVAH and 13 times per month in the private hospitals, and therefore a thorough knowledge of all aspects of otitis and its treatment in the dog should be part of undergraduate surgical training. The higher number of plastic procedures at OVAH would be expected with its major and advanced caseload, although reconstructive work could have been hidden in major fight-wound repairs in the private hospitals' data.

The higher number of dental procedures in private hospitals may be due to routine periodontal treatment being considered a minor procedure mostly associated with private practice. Dental procedures made up 3 % of the OVAH caseload, while in the private hospitals they made up 9.5 %. Twelve per cent of monthly case volume was recorded as dentistry for private hospitals by Vasseur *et al.*,⁷ while dental procedures at VMTH were 6.0 % of the monthly caseload. Dental procedures were entered as combination procedures, and recording extraction of teeth did not in all cases specify which teeth were extracted. The figure for surgical extraction seems to be very low both for OVAH and the private hospitals when the number of routine periodontal treatments is considered. Nine advanced canine endodontic and 2 orthodontic cases were recorded at OVAH.

Ophthalmic procedures made up 1.7 % of the caseload at VMTH and 2.4 % in private hospitals in the USA⁷. In the present study, OVAH performed 3.4 times

more major ophthalmic procedures in dogs and 200 times more advanced ophthalmic procedures than private hospitals. Ophthalmic procedures made up 11.9 % of the caseload at OVAH and 1.5 % in the private hospitals. The great difference in caseload between OVAH and the private hospitals in ophthalmic surgery reflects a personal interest by an OVAH staff member in this field.

Neutering made up 12.1 % of the VMTH caseload and 22.9 % of the private hospital caseload in the USA. It made up 31.4 % of the OVAH caseload and 33.3 % of the private practice caseload. Ovariohysterectomy is used as a major surgical teaching procedure for soft-tissue surgery and surgical theatre practice. Assuming that there are 90 senior-year students at OVAH, each student would have performed at least 7 ovariohysterectomies.

Orthopaedics of joint, fracture and miscellaneous conditions accounted for 25.8 % of the OVAH caseload and 5.6 % of the private hospital caseload, and included minor, major and advanced cases. In the study by Vasseur *et al.*,⁷ fractures requiring internal fixation, accounted for 4.3 % of the caseload at VMTH and 1.8 % of the private hospital caseload. Cruciate ligament rupture, miscellaneous orthopaedic procedures, casts and splints, femoral head ostectomy and luxation, patella luxation and limb amputation, arthrodesis and ununited anconeal processes were listed individu-

ally in the latter study.

Oncology cases for OVAH (4.7 %, $n = 116$) and the private hospitals (4.9 %, $n = 102$) were similar. That OVAH saw more than 40 times more neurology cases, is evidence of a special interest of a staff member in spinal decompression. Myelography, advanced instrumentation and skill are required for spinal decompression. Practice number 2 also had 25 spinal cases, mainly referred to the resident specialist surgeon.

Of the procedures carried out more than once a month in private hospitals, only 3, namely abscess, tail and dewclaw surgery and coeliotomies, do not appear in the list of the top ten procedures at OVAH. Perhaps coeliotomies should be given greater emphasis at OVAH at undergraduate level, as this is regarded as a major procedure and is commonly performed in the private hospitals. The rest of the top 25 private practice procedures that do not appear in the top 25 of OVAH, were of a minor nature. Cosmetic procedures are, for ethical reasons, not carried out at academic institutions, but are often performed in private practice. Fourteen of the top 20 procedures in Johnson *et al.*'s study⁵ appear in the top 20 in this study. Apart from cage rest, the procedures in the top 25 of OVAH but not the private hospitals were of an advanced nature. Cage rest could not be compared as this form of treatment, mainly associated with orthopaedic cases, was not recorded in the private practice data. Spinal decompression, intraocular surgery, endodontics, arthrodesis and intrathoracic surgical procedures were of an advanced nature and did not occur frequently in the private practice data. Rectal/anal surgery and salivary gland surgery were uncommon and were also not frequently performed in the private hospitals. These 5 fields of advanced surgery may indicate natural fields of specialisation, namely neurosurgery, ophthalmology, dentistry, orthopaedic and cardiovascular surgery. Although these procedures are taught to

undergraduates at OVAH, referral to a specialist is recommended.

Twenty-nine per cent ($n = 726$) of the caseload at OVAH ($n = 1726$) comprised trauma cases. These data were not collected for the private hospitals under the heading 'trauma'; however, the importance of emergency patient care and pathophysiology of trauma patients is reflected in these figures. Referred cases accounted for 36.1 % ($n = 897$) of the OVAH caseload. Information could only be obtained from 1 private practice where 7.8 % of the dog and cat caseload was referred.

Four practices had significantly more major and advanced cases than usual and would therefore be suitable for the training of postgraduate students. Practices with a much lower incidence of such cases would not be suitable for postgraduate training, although, when the high caseload per category is taken into account, these practices may well be above average in certain categories.

No seasonal trends in companion animal surgery were apparent.

Although private practices are concerned mainly with minor procedures, undergraduate students need to see relatively more advanced cases to be able better to understand the pathophysiology of the cases, know how to diagnose and them and what the treatment should be. While a teaching hospital should be a cutting-edge referral centre, dealing with unusual and difficult cases so that advances in veterinary medicine can be made, it should be noted that most graduates end up in private practice, whose needs often differ substantially from those of an academic institution.

Advanced cases should preferably be referred to a specialist. With the graduation of specialist-surgeons, the pet-owning public will demand higher standards of care. In this regard, it must be noted that most veterinarians who wish to become companion animal specialists, do so by acquiring their academic and practical training at a veterinary teaching institu-

tion. Acquiring specialist status while in practice, however, is fraught with difficulties at present. Practitioners find the allocation of time for study difficult, especially if this requires long periods away from a practice. We enter a plea for courses to be run in modular fashion, *i.e.* broken up into number of short periods, but adding up to the same total. Modern education should be flexible and the constraints imposed by traditional course regulations should be softened to widen the availability of postgraduate education to all who wish to take advantage of it.⁸

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