

# Forensic veterinary medicine

## 1. Investigation involving live animals



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Simon Newbery and Ranald Munro

**Forensic veterinary medicine is an extremely broad subject covering the entire range of animals with which veterinary surgeons are involved. Cases may involve situations as diverse as physical abuse (eg, beating, stabbing or strangulation), gunshot wounds, trapping injuries, dog worrying, poisoning and malnutrition resulting from neglect. This series of two articles illustrates the basic principles of forensic work, the first of which discusses the protocol for investigating and reporting on cases involving live animals. The second article, to be published in the June issue of *In Practice*, will describe how to carry out a postmortem examination in suspected cases of abuse and how to interpret the findings.**

### Fundamentals of veterinary forensics

Forensic veterinary medicine is a relatively new specialist area. The fundamentals of any forensic veterinary investigation are similar to those that underlie human forensic medicine and involve objectivity, careful recordkeeping and maintenance of the chain of evidence. However, the major difference between veterinary and human forensic medicine lies in the large numbers of species that can be presented for examination. It is therefore unreasonable to expect any one veterinary surgeon to be knowledgeable about all species. Consequently, it is extremely important that cases are examined by clinicians who have the required knowledge and experience to report on the species of animal in question. The golden rule is to avoid straying out of your area of expertise and remain within the limits of your professional competence.

A veterinary surgeon's report forms only a part of the mass of evidence that is drawn together by legal teams for presentation to a court of law. It is important to note that it is not the remit of a practitioner to

decide on the rights or wrongs of a case or to prove a case, as it is for the courts to make such decisions. The vet's role is to describe and explain the nature of the veterinary findings and any suffering that might have resulted from them.

The veterinary surgeon in general practice may deal with animal welfare cases caused by neglect, physical abuse (also known as non-accidental injury or battered pet syndrome), sexual abuse and emotional abuse (Box 1). Although practised unknowingly by vets for many years, veterinary forensics is only just becoming recognised as a discipline in its own right within the veterinary profession. Forensic veterinarians are registered veterinary surgeons who have knowledge in a particular field of veterinary science and who have experience in the recovery of forensic samples. They should also have experience in preparing evidence for court and providing a well-balanced professional opinion. Note that, in English and Scottish law, a lack of 'intention' to abuse is irrelevant and it is not a defence for people to claim that they did not intend to harm the animal or that they were unaware of an animal's needs.

In the veterinary context, crime scenes can include a room in a house/premises where an animal has been abandoned, the body of a starved animal in a kennel or a live animal in appalling body condition that is brought to the surgery for clinical examination. The animal is only one part of the overall crime scene, but should be processed as a crime scene in its own right.

Veterinary surgeons may also be asked to:

- Deal with injury or death of companion animals, farm livestock or wildlife;
- Identify recovered drugs or paraphernalia from dog fight premises;
- Help agencies with forensic video evidence of wildlife cruelty such as badger baiting or fox digs.

Irrespective of the type of case, veterinary surgeons

### Box 1: Practitioner's role in forensic veterinary medicine

General practitioners may be asked to investigate:

- Cases of emaciated live animals;
- Cases of failure to provide veterinary treatment;
- Cases raising suspicion of non-accidental injury, sexual abuse or emotional abuse;
- Cases of abandonment of an animal.

They may also be asked to provide a professional opinion on:

- Other people's evidence, reports, videos or photos;
- Veterinary-related matters (eg, animal medicines) as part of some other ongoing investigation.

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must be prepared to examine the animal, document the findings in a clear and methodical way, and produce a report that sets out the findings, provides a clear interpretation of the facts and reaches a balanced conclusion. This report may or may not end up being presented in a court of law.

## Taking instructions for clinical work

The initiation of a forensic case usually begins with a phone call from an agency such as an animal welfare organisation or the police (or possibly a solicitor) but may also arise following examination of an animal in the clinic. From this point onwards, everything must be documented in contemporaneous notes from which a clinician will, in due course, write his/her report. Veterinary surgeons may also have to rely on these notes in court if asked to attend to give evidence. Practitioners should work on the premise that all cases might potentially be the subject of some form of litigation and that they might be called upon, sometimes months later, to relate their expertise as veterinary surgeons in court.

When first contacted about a potential forensic case, a number of key case details should be recorded (Box 2). At this time, you should decide whether you are the best person to deal with the case. Veterinary surgeons should always ask themselves if they are suitably qualified to conduct the investigation or whether a specialist in a particular species or discipline should be involved. It is also important that any vested interest is declared to the person/agency requesting the investigation (eg, you may know one of the parties involved, they may be clients or you may have examined the animal previously). Not doing so could seriously affect the outcome of a case later in the proceedings.

After noting the essentials listed in Box 2, an arrangement should be made to examine the animal (sometimes, in extreme circumstances, a case may arrive unannounced at a clinic). Normal triage rules apply so, if required, any lifesaving, emergency intervention should always be carried out as a matter of priority, while remembering that as much forensic evidence should be preserved as possible, but not at the expense of the welfare of the animal.

## Evidence collection and documentation of the crime scene

It should be remembered that there is only one chance of properly examining a crime scene, be it an animal or its environment. There is a duty to preserve all the evidence and to keep a record of the various procedures conducted or items retained. These records and retained items might include:

- Clinical details of wounds or signs of malnutrition;
- Results of laboratory tests on samples taken during an examination;
- Accompanying evidential items, such as collars, tethers, bedding, and so on.

A chain of custody starts with a written record of all evidence transferred from the crime scene to the point of attending court, and acts as proof that the items of

### Box 2: Initial information to be recorded

- Who contacted you (ie, the name of the officer/inspector and their contact details) and details of their agency (eg, police, RSPCA, SSPCA, RSPB)
- Date and time of when you were contacted
- Brief notes regarding the type of animal or documents you are to examine/investigate. Record the numbers of animals/documents to be examined. When examining photographic evidence, note how many pictures were supplied and whether these were loose or placed in an album, and add a general comment about the quality of the photographs
- Brief notes of what is expected of you and how soon the findings are required
- Any reference/log details
- List of further information you require

### Box 3: Processing physical evidence

- Discover, recognise and examine evidence
- Collect, record and identify evidence
- Package, convey and store evidence
- Exhibit evidence in court
- Dispose evidence when the case is closed

evidence collected at the crime scene are the same as those being presented in a court of law. The chain of custody tag/label must accompany the evidence all the way to its final destination.

In order to process the physical evidence, it must be identified, collected and packaged (Box 3). There are five main ways of documenting a crime scene:

- Sketching;
- Photography/videoing;
- Measuring;
- Narration;
- Collecting physical evidence.

Table 1 indicates how the evidence might be documented and recorded from a patient. The equipment and other items required for the examination are shown in Box 4. It is important to ensure that the correct equipment is ready before examination of the patient begins.

## Arrival of the patient

On arrival of the animal at the surgery, it is important to ascertain that proper procedures have been followed. The owner's permission may be needed before the patient can be examined and samples taken. (However, under the Animal Welfare Act 2006, it is permissible to take samples without the consent of the owner for the purpose of determining whether an animal is suffering or is likely to suffer). It is also necessary to establish whether the owner or the agency is responsible for the animal at the time of examination.

**Table 1: Documenting evidence**

Evidence	Documentation
Physical (eg, clinical examination)	Evidence list Evidence storage log Contemporaneous notes
Photographic/video (eg, overview, approach and close-up)	Photographic log Video log Contemporaneous notes
Sketches (eg, templates to mark wounds or lesions)	Contemporaneous notes Links to photographic evidence

**Box 4: Equipment and items required for examination**

- Clinical equipment
- Measuring equipment (eg, tape measures, scales)
- Items to aid evidence collection (eg, bags, bottles, notebook, labels, templates, markers, sealing and hazard tapes)
- Video and still camera set to the correct time and date



(above) Ruler and photoscales, marker pens and labels to document any evidence collected. (right) Evidence bags, swabs, disposable containers and various sizes of bottles should be available during an examination to collect samples



Initial details that should be collected when a patient arrives for a forensic examination are listed in Box 5.

Identification is a key part of the clinical examination. The animal should be identified by species, breed or variety, sex, age, weight measurements and any specific markings, such as tattoos or surgical interventions. Many animals are microchipped and this should be checked and recorded.

A full history of the animal being examined is not always available during an examination and may not come to light even after further inquiries. It is vital to establish whether an animal:

- Has received any professional care from another vet;
- Is on any medication;
- Has had treatment from the keeper/owner.

This information is usually obtained from the handler of the animal (eg, police or animal welfare society inspector), rather than the owner and should

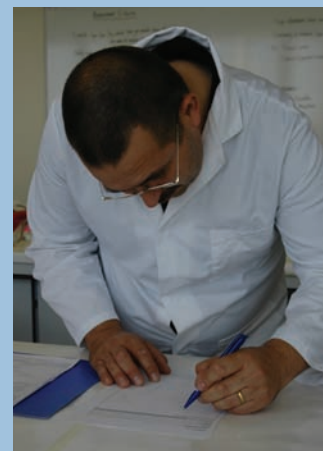
be recorded in the contemporaneous notes. Use of pre-prepared templates allows findings to be recorded quickly and systematically. Box 6 highlights the general protocol for the initial examination of live animals.

**Box 6: Protocol for the initial examination of a live animal**

- Examine an animal thoroughly, and record any findings meticulously. Your best tools are your senses and your pen
- Measure and weigh the animal
- Take blood and faeces samples as a minimum and carry out a full haematology/biochemistry profile and faecal analysis. Consider whether any other tests are relevant
- Photograph/video the animal
- Bag and keep all evidence locked somewhere safe
- The integrity of the chain of evidence relies on numbered bags, tamperproof seals and labels
- Identification numbers on bags, seals and labels should be entered into logs and contemporaneous notes

**Box 5: Details to collect when a patient arrives**

- Date and time of when the animal arrives, the animal's details, and the details of the person bringing in the animal for examination
- Address of where the animal arrives and the place where the examination takes place
- Details of transportation, including departure and arrival times
- Record that unnecessary contact with the animal was avoided
- Record information as seen (note an animal is a crime scene in its own right). See section on photography/video recording for more information
- Date, time and place of the examination, who is filming and who is present at the examination
- Use labelling to link your contemporaneous notes and what the court will see



Taking notes at all stages of the investigation is vital. The better the notes, the easier it is to write a report and to give evidence in court

## General impression of the patient

A general impression of the patient should be formed by looking at, and listening to, the animal from a slight distance (Box 7). This should commence as soon as the patient enters the premises and should continue until the general clinical examination begins.

## Clinical examination of the patient

A thorough clinical examination should be carried out while noting all findings, good and bad, remembering that you are working on behalf of the court rather than a particular agency. This examination is a visual and manual examination to collect information that can guide problem formulation and give direction to further examination. These procedures are summarised in Box 8 and are well documented (Rijnberk and van Sluijs 2009).

During examination, the following measurements should be noted:

- Weight of the animal;
- Length of the animal from the nose to the base of the tail;
- Circumference of the thorax at the elbow;
- Circumference of the abdomen;
- Circumference of the neck;
- Circumference of the thighs.

These measurements provide baseline data regarding an animal's condition and give the practitioner a yardstick for assessing progress during follow-up examinations. Body condition scoring can be evaluated using either five- or nine-point systems (eg, Tufts Animal Care and Condition [TACC] and Purina scales).

Dorsal, ventral, cranial, posterior, lateral and medial aspects of each part of the animal should all be examined, including the feet, which are a very important but often overlooked part of the examination. Overgrown or frayed nails may indicate neglect or injury (Fig 1). Similarly, worn or injured pads may



**Fig 1: Careful examination of all feet is an integral part of a clinical examination. Overgrown nails may indicate neglect**

provide clues about where the animal has been or what it has suffered. For descriptive purposes, it is useful to identify the sides of the toes as 'axial' and 'abaxial'. However, these terms need to be explained in a manner that is understandable to the lay person. A simple diagram with arrows showing which side of each toe is 'axial' and which is 'abaxial' is usually helpful.

All orifices, such as the mouth, ear canals and genital/anal areas, should be examined. The coat should be assessed with a good quality ultraviolet light for trace evidence such as saliva, blood and other bodily fluids. These traces should be recorded and samples collected before the examination proceeds further. The animal's behaviour should be noted throughout the examination.

## Video recording and photography

Video recording and photography should be used to record the appearance of objects and their relative positions, so that other people who are not present at that time can see the evidence and the crime setting (Rynearson 2002).

The purpose of videoing/photographing the scene (in this case, the patient) is to accurately depict the scene as it appeared at the time the investigating veterinarian took charge of it. The composition of the video/photographs should be factual and not artistic, and light should be used as a tool not an effect.

Box 9 suggests some simple ways of ensuring a meaningful and convincing video/photographic record of the evidence is obtained.

### Video recording

Video-taping provides an easily understandable viewing medium that shows the layout of a crime scene and the location of evidence, be it an animal or the environment in which it was found.

When videoing a crime scene, the video should start with a brief introduction from the camera operator to identify him/herself. The introduction should also include the date, time, location, type of crime scene and any other important introductory information. It should provide a brief description of the animal, rooms and evidence that will be viewed in the video tape. During the introduction, the operator may

### Box 7: Features to observe when forming a 'general impression'

- Level of consciousness
- Behaviour
- Posture
- Locomotion
- Body shape
- Nutritional condition
- Coat
- Abnormal sounds
- Abnormalities that stand out

### Box 8: Features to note in a clinical examination

- Respiratory movements
- Pulse rate
- Body temperature
- Coat and skin condition
- Colour of mucous membranes
- Peripheral lymph nodes
- Other notable abnormalities

### Box 9: Creating a video/photographic record of evidence

- Practice as much as you can
- Tailor the mix of photographs and video to suit the case in hand
- Plan your video-taking strategy in advance
- Make sure date and time settings on all equipment are correct and match
- Take a 'walk through' video when showing premises or an overview video when dealing with a single animal at the clinic
- Take plenty of still photographs, showing an overview of the crime scene, as well as approach and close-up views, and use labels and markers to identify specific areas of interest
- Document everything and keep a photographic log. If it is not written down, as far as a court of law is concerned, it did not happen!
- When photographing and videoing individual animals in multi-animal cruelty cases, allocate numbers to each animal and position them obviously in the photograph/video (the authors use labelled wipe-clean laminated cards held next to each animal)
- Remember some things may not initially appear to be worth photographing, but may end up being of vital importance later on in an investigation

want to use a basic diagram to illustrate the layout of the rooms/corridors and the relationship of the crime scene to the surrounding premises/environment.

After the introduction, the crime scene/animal should be video-taped with the audio switched off to prevent the video camera picking up unwanted comments from observers. Video-taping of the animal should begin with a general overview of the scene and surrounding area. This should include both wide-angle and close-up views to show the layout of the animal, the location of the evidence and the relevance of the evidence within the crime scene. While video-taping, use slow camera movements when panning and zooming.



Fig 2: ABFO photo scales are valuable aids to ensure that the camera is positioned correctly. These scales may be used with live patients

First, look all around the area in which you are standing using the full field of view to take in as much general information as possible. Then, narrow the focus on a particular area but avoid, at this stage, focusing totally on one point or area on the patient. Finally, focus on a specific point using a close-up view to record a particular feature (eg, a wound) accompanied by photographic measuring scales.

### Still photography

As with video-recording, 'still' photographs should first show the overall crime scene before showing the whole animal and, finally, close-up views of particular points of interest. The purpose of these photographs is to give general relationships between all the items present and therefore all evidence must be visible in at least one of the views showing the entire scene. At this point, you need to assess if everything of interest to you has been covered in at least one of the shots. If so, the scene should be photographed again from a different corner of the room. If an area of interest is obscured (eg, one leg in the field of vision is hiding a wound on the medial aspect of the opposite leg), reposition yourself and repeat the full set of photographs as described above.

A restricted field of view should be chosen for approach shots, but this should still include sufficient detail to orientate the animal. All items/areas of evidence must have approach shots, each of which may cover a number of items (eg, several different wounds on the patient). All approach shots should contain numbers/evidence markers.

For close-up shots, the object should occupy almost the entire frame. These serve as effective 'enlargements' of specific points of interest. If an object in a photograph occupies only a small proportion of the picture, the clarity of any subsequent enlargement will be much less compared with a similar enlargement of an object that fills the entire frame.

Photographs should be taken with the plane of the camera parallel to the object. This avoids distortion (eg, elongation of objects), which may give a false indication of size. ABFO photo scales are very helpful in ensuring correct positioning of the camera (Fig 2, 3). Each close-up photograph should contain a scale and a reference number.

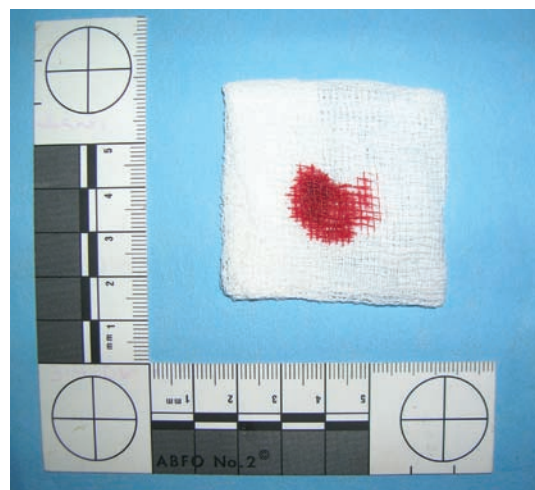


Fig 3: ABFO photo scales are also useful when photographing objects that may form part of the evidence

## Follow-up examinations

Re-examination will often be required in animal welfare cases to show the progress of the patient examined. The type of case will influence the number and frequency of these follow-up examinations. The investigating veterinarian should stipulate where and when follow-up examinations will take place and how many of these are necessary. In addition, the clinician should ask to be informed of the animal's progress while in care and should obtain copies of, or ask to see, boarding records on each follow-up visit. It is important for the investigating practitioner to liaise with other vets/agencies involved, and to record these details.

## Security of evidence

Security of evidence and notes is of the upmost importance (Box 10). All contemporaneous notes, reports and results, together with any exhibits/productions for court, should be securely stored. These should not be stuffed in your personal work drawer! Use a lockable cupboard or cabinet, and a log book for recording when evidence is moved in and out of this storage.

## Video and photographic evidence

Video/photographic evidence should be handled and secured as exhibits/productions. Hence:

- Master copies should be clearly labelled (Fig 4);
- All copies should be numerically referenced;
- In England and Wales, all copies should have Criminal Justice Act (CJA) labelling/markings to indicate the chain of possession for a court of law;
- The date and time of when the video/photographs were taken and when they were placed in storage should be recorded.

## Laboratory samples

Laboratory samples (eg, blood and faeces containers) should be labelled with the reference number, the animal's details, who took the samples and the date of sampling. The samples should be stored correctly and securely until they are collected for delivery to the laboratory. Ideally, the veterinarian should deliver the samples to the laboratory personally. The authors use a courier that employs a fax-back system, whereby the courier signs the evidence bag containing the samples and a fax-back form (Fig 5) detailing the evidence. This

### Box 10: Security of evidence

For each piece of evidence:

- Note the date and time it arrived at the evidence store
- Write a brief description of the evidence (this should be the same as the description recorded in the 'search and seizure' log completed by the investigating agency when the animal/specimen was seized)
- Note the condition of the evidence on arrival (this should hopefully be same as that recorded earlier)
- Note the name of the person delivering the evidence (this may or may not be the same person who seized the evidence)



Fig 4: Master video tapes should be clearly labelled and each copy should be numerically referenced

form is photocopied and kept in the file. Once the courier has transported the samples to the laboratory, the person receiving the samples signs and dates (including the time) the accompanying form and the package to acknowledge receipt and the form is faxed back to the practice for filing.

## Controlling the movement of evidence

Control over the movement of evidence from storage must be considered. Anyone wishing to see the evidence must check the evidence out and then back in when they have finished. The following information should therefore be noted in the evidence log:

- Date and time of when the evidence was checked out;
- Identification of the evidence;
- Name of the person checking the evidence out;
- Whether any evidence was opened. This should be carried out correctly (see later), and any material should be resealed, signed and dated;
- Date and time of when the evidence was checked back in.

## Re-examination of sealed evidence

- Select the item for examination.
- Confirm the correctness of the details on the CJA continuity label.

Forensic Samples Fax Back Form

I have today collected, from S.G. Newbery BSc BVetMed MRCVS Veterinary Surgeon, 14-16 Greenside, Staincross, Barnsley, a sealed package identified as..... containing veterinary samples for NWL ltd for laboratory testing.

Courier Name.....

Signature.....

Time..... Date.....

I have this day received a sealed package from the courier above, identified /marked as ..... from S.G. Newbery Veterinary Surgeon for laboratory examination. I acknowledge receipt of this package.

Received by.....

Date..... Time.....

Please fax this signed document back to Greenside Vets. (01226 388202) on receipt of package to maintain chain of custody. Thank you for your co-operation.

Fig 5: Customised fax-back forms can be readily created in the practice and used to maintain the chain of evidence when sending samples to laboratories

- Confirm the integrity of the seals and the package.
- If possible, open the package in such a way that does not disturb the original seals.

An evidence bag will have a manufacturer's seal at the base of the bag. The mouth of the bag will have a seal that was applied by the person who placed the evidence within the bag (eg, the police). By retaining the original seals intact, the forensic veterinarian can always demonstrate, at a later date, that the packaging had not been opened by another person before the re-examination took place. Any new opening of an evidence bag should be sealed with tamperproof tape (Fig 6), and signed and dated.



**Fig 6: Tamperproof tape is ideal for re-sealing evidence bags following re-examination of the contents**

### Specific evidence

See further reading for how to package specific types of evidence. Certain special considerations may have to be given to trace evidence such as fibres, paint flakes, gunshot residue, vegetation, pollen or glass found on an animal. All trace evidence should be photographed in situ before collection and packaging.

The uniqueness of DNA has been proven to be as useful for domestic animals as for humans. It may be used when the animal is a victim, perpetrator (eg, bite wounds) or link (when DNA is transferred to or from an animal present when a crime is committed). Collection and handling of DNA evidence is extremely complex and requires special training.

### Reporting findings

There is no 'standard' type of report but certain formats are available (eg, from the Academy of Expert Witnesses) and may be used as a template. There are many individual ways of writing and presenting a report to a court as a professional witness or as an expert in a particular field. Several firms run excellent courses on report and statement writing and on giving evidence in court.

A report should collate your findings so that a court is able to piece together a picture of what you saw on the day of the examination, what samples and information you collected and documented, what diseases and conditions you included in your list of differen-

#### Box 11: Approach to report writing

- Understand the purpose for the report
- Always consider that your report could end up in court, no matter how informal the case
- Keep the report absolutely professional, clear and concise
- Collate all information, contemporaneous notes, photos/videos, lab results, evidence labels/identification references
- Use blank templates for reports (this will ultimately save you time)
- Provide factual information that matches your contemporaneous notes (this makes it much easier to give evidence in court)
- Identify the strengths and weaknesses of your findings/evidence
- Leave opinions and discussions until the end
- Re-read your report and check it, and repeat this process as necessary until you are happy that it presents your assessment of a case correctly

#### Box 12: Appearing in court

- List what you need for court
- Confirm details about the court case (eg, when, where and how long will you be required)
- Dress appropriately
- Arrive early to meet up with solicitor/barrister to discuss last-minute details
- Plan for an 'ambush' by taking lots of notes
- Clearly mark relevant pages in your documents to which you may need to refer
- Stay cool

tial diagnoses, and the relevance and interpretation of your findings (Box 11). Before reaching a decision on whether an offence has been committed, the court needs to understand the veterinary evidence. The court will want a clear explanation of why you came to a particular conclusion following your clinical examination of the patient.

### Preparation for court

Preparing for attendance at court will involve liaising with agencies and solicitors/barristers. There may be precourt meetings in the weeks leading up to the case or, more commonly, on the day just before the case is heard. Take notes to which you can refer when in court if required. Prepare thoroughly and dress appropriately. Take your cues from the dress code of the barristers. It is entirely unprofessional to appear in court wearing a fleece top, cargo trousers or trainers. Additional considerations for appearing in court are listed in Box 12.

### Summary

The demand for forensic information is on the rise as more agencies require veterinary surgeons to apply their professional expertise to animal crime investigation. General practitioners are increasingly required to have adequate training in recognising animal crime and how to conduct evaluations that will hold up in court, and aspects of forensic veterinary medicine are now also being covered at undergraduate level. Greater awareness of the legal requirements related to forensic investigations will enable clinicians to be better prepared to handle evidence within their own fields of expertise.

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