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Dispense some care to the wild side

Nicola Louise Ryan
Shropshire, UK

ABSTRACT: Veterinary professionals should act on a crucial role in wildlife rehabilitation. We took an oath to "ABOVE ALL ... endeavour to ensure the health and welfare of animals" (RCVS code of professional conduct 2012) – this does not stop at domestic species. Wildlife care is both exciting and rewarding, offering us the honour to use our skills to help relieve individual suffering while potentially improving species numbers. Veterinary practices are not set up for treating wildlife, but they are often the first line of care. How we respond to wildlife casualties can have huge implications for the ongoing welfare of that patient.

Nicola Louise Ryan

Nicola entered the nursing world after completing a BSc (Hons) in Animal Behaviour and Welfare, completing her RVN training at a 24-hour referral hospital in 2015. On qualifying, she secured her dream job working with wildlife as an RVN/wildlife assistant at a busy wildlife hospital in Cheshire. She has since gone on to complete the City and Guilds Veterinary Nursing of Exotic Species and continues to volunteer for various wildlife charities in her spare time, including carrying out dawn chorus bird surveys for the Wildlife Trust.

E-mail: Nicola.wildlife@gmail.com

DOI: 10.1080/17415349.2017.1327832

Admission of wildlife

The admission of wildlife is so important to successful rehabilitation. Nurses should implement a proper wildlife admission protocol including an admission form containing the following vital information:

- Reason for admission
- Any treatment given
- Any food/water given
- Exact location where the animal was found
- Signed transfer of ownership
- Contact details of the finder

This information will really help the next stage of the process, whether that is re-release, transition to a specific wildlife facility, or further hospitalisation.

One of the most important pieces of information to gain upon admission is the location where the animal was found. This is particularly important for adults of a given species as they will have an established territory, will know where is safe, and will know where to go to find food. If an adult is re-released into an unknown setting it must find all these resources again at a time when it may be most vulnerable.

Law

Morally, we have an ethical duty to care for wildlife. One of the many reasons wildlife is admitted into care is due to human impact, either directly (such as a strimmer injury) or indirectly (such as habitat fragmentation).

Alongside this we have a legal duty. The Wildlife and Countryside Act 1981 permits taking a wild animal from the wild that is sick or injured with the sole purpose of tending to it until it is fit to be released. The animal should not be kept in a manner that would inhibit its capacity to return to the wild. For example, corvids can easily imprint, foxes can easily be tamed, and birds can easily damage their feathers when housed or transported in inappropriate carriers, all of which can delay or prevent release into the wild. The animal can only be kept for the purpose of tending to it and until it is no longer disabled.

Once wildlife is in the possession of the finder, in law, it becomes their property. Thus, ownership must be transferred from the finder to the veterinary practice to enable the veterinary treatment to proceed. This highlights the requirement for the transfer of ownership on wildlife admission forms. Any treatment provided to the animal must comply with the Veterinary Surgeons Act (1966). Once brought into captivity, the animal is further protected by the Animal Welfare Act (2006). This legislation covers the "five freedoms". With wild animals, it can be hard to provide both "freedom from stress" when it comes to prey species, and the "expression of natural behaviour" when placing an animal in a captive environment. However, we must do our best to meet the requirements of the legislation to the best of our abilities, reduce stress as much as possible and prevent unnecessary suffering. This covers all stages of treatment into release. If we release an animal which is unfit for the wild, and will suffer as a result, we are failing to comply with the discussed legislation. As outlined in the BVZS good practice guidelines for veterinary centres (2016), the successful release of a wildlife patient (meaning it has an equivalent chance of survival as its wild counterparts and has the potential to reproduce) is the main aim of treating a wildlife casualty. In circumstances where the wildlife casualty cannot be released in this way, in all but exceptional circumstances, it should be euthanised. This again is why it is useful to know the normal behaviour of a wildlife casualty, as it allows clearer assessment of how treatment may affect the animal in the wild. For instance, a one-eyed hedgehog that relies mostly on its sense of smell and hearing may cope fine in the wild, but a one-eyed diurnal bird of prey that relies on precision sight to hunt would not. Again, if you are unsure, contact a trusted wildlife hospital for advice. Euthanasia decisions rely on more than just medical expertise in wildlife cases.

Wildlife care – the basics

When you are presented with wildlife, don't panic. Your approach to a wildlife patient compared to a domestic patient will differ, but ultimately the principles are the same. If your patient is dehydrated or hypovolaemic, appropriate fluid therapy and electrolyte assessment is required; if your patient is hypothermic, then careful warming provision is crucial. With all casualties, hydration, warmth and freedom from stress and pain are priorities, stabilisation of breathing and circulation is paramount. The main difference with wildlife is the importance of reducing stress. It can be very exciting to have an unusual patient in, but please consider the physiological consequences of a group of predators staring at an already shocked and highly stressed prey animal. You would not house a domestic rabbit opposite a ferret before an anaesthetic, so please do consider the effects of stress on your wildlife patient too. If you can assess the animal in the box first, then do so. This will allow you to see its natural behaviours before it tries to hide them.

Be prepared – if you know the reason the animal has been brought in then everything can be prepared before handling the patient (hence why the admission forms are so important). For instance, if you are presented with a boxed passerine that has been attacked by a cat you may prepare: some povidine iodine to clean any potential wounds, some oral antibiotics (wounds of birds which have been subjected to cat attacks often contain the bacteria *Pasturella multocida* which if left untreated can lead to a fatal septicaemia (Lawson & Best, 2016), weighing scales and an anti-inflammatory medication. The animal should then be weighed, provided with first-aid treatment, and placed within appropriate housing and left to recuperate in a quiet, dark place.

If you can collect a faecal sample from the box the animal was transported in then please do so, as this may be useful for the wildlife centre you send it on to, particularly in the case of an ill hedgehog that is anorexic.

It might be useful to have a few things set to one side for wildlife casualties. An example of some of the things which may prove useful in a wildlife first-aid box are shown in **Table 1**.

As stabilisation is key in wildlife casualties, the two major forms of first aid we can provide is warmth and fluids. Most wildlife casualties will require rehydration fluids before more substantial nutrition is supplied. Although most wildlife patients will be deficient in fluids on admission, the deficient fluid should be administered over a few days. Typically:

Day 1: Maintenance + 50% of deficient

Day 2: Maintenance + 50% of deficient

Day 3: Maintenance fluids

(Fowler 2007, Girling, 2013)

It is very important to know the correct fluid requirements for your species. For example, maintenance rates for birds (over 100 g) and hedgehogs would be 50 ml/kg (Girling, 2013; Mullineaux & Keeble, 2016; Pollock, 2010). Consider the stress of giving fluids to a wild animal when working out fluid regimes. Clinically, small boluses may be more effective, but

Table 1. Wildlife first aid kit

Item	Use
Crop tube	For providing oral fluids/nutrition
Tweezers	For feeding larger birds or for the removal of maggots in myiasis casualties
Povidine iodine	For the initial treatment of wounds- wildlife wounds are often dirty. Only use in the first instance, not on granulating wounds
Hydrogel	A hydrogel such as intrasite for providing a moist environment to optimise healing by 2nd intention/prevent wound edges drying out prior to suturing
PPE	Gloves should always be worn when dealing with wildlife, which often harbour diseases of zoonotic potential e.g. salmonella, ringworm, leptospirosis, chlamydiosis, camplylobactor and rabies. They also protect the animals from anthroponosis (reverse zoonosis), cross contamination, and from the oils in our hands which can affect many species e.g. it impairs the waterproofing of bird feathers, and can be harmful to amphibians which can absorb oils and salts through their permeable skin
F10 (spray and ointment)	Treatment of myiasis and wound management
Heat pad	Heat pad/heat lamp/incubator to provide warmth
Towel	Lining transport boxes to prevent slipping, providing a warm and cushioned surface for animals to rest on during examination, for placing over animals heads during examination to keep them calm. They are particularly useful in casting birds of prey
Rehydration fluid	Packet of rehydration fluid such a glutalyte (Norbrook Laboratories) or lectade (Pfizer). Most wildlife casualties will require rehydration fluids before more substantial nutrition is supplied
Hartmann's solution	For providing fluid therapy where oral fluids is not an option/appropriate
Paintbrush/irrigation cannula	For feeding/medicating small rodents, bats and small birds. There is an increased risk of aspiration pneumonia with smaller patients. To be careful not to flood their mouths (and lungs!) a paintbrush allows them to lap a small amount of rehydration fluid, or a miniature pipette/irrigation cannula attached to a syringe allows a more measured and slow control of fluid as they lap
List of contacts	Work on getting yourself some trusted contacts in your local area, whether for advice or for transfer. Make sure that list is available for everyone who may be on duty
Wildlife manual	A wildlife folder (both in electronic format and paper-based) which covers basic feeding regimes and husbandry guidelines for various species. The guide should be user friendly for all staff and can be a good reminder to yourself of protocols
Exotics formulary	Useful for dosages of unfamiliar species. Helpful in ensuring the medications used are appropriate for the given species

Table 2. Wildlife and Countryside Act 1981 Schedule 9 species (GB non-native species secretariat 2010)

Common name	Scientific name
Bass, Large mouthed Black	*Micropterus salmoides*
Bass, Rock	*Ambloplites rupestris*
Bitterling	*Rhodeus sericeus*
Budgerigar	*Melopsittacus undulatus*
Coypu	*Myocastor coypus*
Crab, Chinese Mitten	*Eriocheir sinensis*
Crayfish, Noble	*Astacus astacus*
Crayfish, Red Swamp	*Procambarus clarkii*
Crayfish, Signal	*Pacifastacus leniusculus*
Crayfish, Spiny-cheek	*Orconectes limosus*
Crayfish, Turkish	*Astacus leptodactylus*
Deer, Chinese Water	*Hydopotes inermis*
Deer, Mutjac	*Muntiacus reevesi*
Deer, Sika	*Cervus nippon*
Deer, any hybrid of Sika	*Any hybrid of Cerbus nippon, Cervus and any hybrid of the genus Cervus*
Dormouse, Fat	*Glis glis*
Duck, Carolina Wood	*Aix sponsa*
Duck, Madarin	*Aix galericulata*
Duck, Ruddy	*Oxyura jamaicensis*
Flatworm	*Kontikia andersoni*
Flatworm	*Kontikia ventrolineata*
Flatworm, Australian	*Australoplana sanguinea*
Flatworm, New Zealand	*Artiposthia triangulata*
Frog, Edible	*Rana esculenta*
Frog, European Tree (or Common Tree Frog)	*Hyla arborea*
Frog, Marsh	*Rana ridibunda*
Gerbil, Mongolian	*Meriones unguiculatus*
Goose, Bar-headed	*Anser indicus*
Goose, Barnacle	*Branta leucopsis*
Goose, Canada	*Branta canadensis*
Goose, Egyptian	*Alopochen aegyptiacus*
Goose, Emperor	*Anser canagicus*
Goose, Snow	*Anser caerulescens*
Heron, Night	*Nycticorax nycticorax*
Limpet, Slipper	*Crepidula fornicata*
Lizard, Common Wall	*Podarcis muralis*
Marmot, Prairie (or Prairie dog)	*Cynomys*
Mink, American	*Mustela vison*
Newt, Alpine	*Treturus alpestris*
Newt, Italian Crested	*Treitus carnifex*
Owl, Eagle	*Bubo bubo*
Oyster Drill, American	*Urosalpinx cinerea*
Parakeet, Monk	*Myiopsitta monachus*
Parakeet, Ring-necked	*Psittacula krameri*
Partidge, Chukar	*Alextoris chukar*
Partidge, Rock	*Alectoris graeca*
Pheasant, Golden	*Chrysolophus pictus*
Pheasant, Lady Amherst's	*Chrysolophus amherstiae*
Pheasant, Reeves'	*Syrmaticus reevesii*
Pheasant, Silver	*Lophura nycthemera*
Pochard, Red-crested	*Netta rufina*
Porcupine, Crested	*Hystrix cristata*

(*Continued*)

Table 2. (*Continued*)

Common name	Scientific name
Porcupine, Himalayan	*Hystrix hodgsonii*
Pumpkinseed (or Sun-fish or Pond-perch)	*Lepomis gibbosus*
Quail, Bobwhite	*Colinus virginianus*
Rat, Black	*Rattus rattus*
Shelduck, Ruddy	*Tadorna fegguginea*
Snake, Aesculapian	*Elaphe longissima*
Squirrel, Grey	*Sciurus carolinesis*
Swan, Black	*Cygnus atratus*
Terrapin, European Pond	*Emys orbicularis*
Toad, African Clawed	*Xenopus laevis*
Toad, Midwife	*Alytes obstetricans*
Toad, Yellow-bellied	*Bombina Variegata*
Wallby, Red-necked	*Macropus rufogriseus*
Wels (or European catfish)	*Silurus glanis*
Zander	*Stizostedion lucioperca*
Boar, Wild	*Sus scrofa*
Capercaillie	*Tetrao urogallus*
Chough	*Pyrrhocorax pyrrhocorax*
Corncrake	*Crex crex*
Crane, Common	*Grus grus*
Eagle, White-tailed	*Haliaetus albicilla*
Goshawk	*Accipiter gentilis*
Kite, Red	*Milvus milvus*
Owl, Barn	*Tyto alba*

holistically if you can give fluids TID/BID to a hedgehog during the times it will be disturbed, i.e. when cleaned out and examined, then this may be much better for its welfare and recovery. Wildlife care is often a careful balance between providing effective treatment whilst being "hands off".

In cases where patients are stable for oral fluids, 5% of body weight [BW] (50 ml/kg) in birds which possess crops and 2.5% of BW (25 ml/kg) in birds with no crop can be provided (Pollock, 2010). Start off slow, particularly with weaker patients or those which may regurgitate where it may be appropriate to feed 1/3 - 1/2 the recommended feeding volume and slowly increase this over the next couple of feeds (Mullineaux & Keeble, 2016; Pollock, 2010). Where oral fluids are not appropriate then other routes must be utilised. Alternative or multiple roots may be more effective in cases of gut pathology (where oral fluids may be less effective) and/or severe hydration (where absorption of subcutaneous fluids will be very slow (Lee, 2013). Adding hyaluronidase to lactated Ringer's solution may be beneficial in increasing the absorption of subcutaneous fluids (Tully, 2011).

When providing warmth, it is important to know the core temperatures normal for that species. For example, a hedgehog's core temperature is around 33.5–36.8°C (Bexton, 2016), whereas a bird's cloacal temperature may be 40–42°C (Goulden, 2016). When providing heat, ensure only half of the cage has the heat supplied so that the animal has the opportunity to escape the heat if it wishes. Remember to keep an eye on the temperature, as a collapsed animal will not be able to move from a heat source that is too warm.

F10 insecticide spray/ointment is also useful to have at hand. It is very useful for hogs with myiasis for its ability to kill maggots quickly and effectively. Large wounds can be packed with the f10 ointment, killing maggots while giving time to allow the animal to be stabilised and warmed up before more intensive wound lavage is attempted (Drake, 2013). Always pack the wound/spray the animal before placing the animal on heat.

When faced with a species that you may be inexperienced with, the idea of handling it may seem very daunting. For example, a bird of prey may seem rather intimidating with its sharp beak and dagger-like talons. As stated in **Table 1**, towels can be a useful way of casting a bird of prey to make handling the animal safer for both the caregiver and the patient. The bird can be cast from behind, draping the towel over their wings and restraining them gently to its body while grasping the legs just above the feet (Girling, 2013) – the talons are the dangerous part!

Important points and useful tips

Know what's normal and remember it is wild

Knowledge of normal behaviour can influence our decision on whether it is right to proceed with a given treatment or whether it is kinder to euthanise the patient. It is also important to understand natural behaviour in order to give us the appreciation of why we must adapt our own behaviour towards our wild patients compared to our domestic patients.

Wildlife will hide pain well so try to observe animals discreetly where you can. Also remember that it's a wild animal. Wild animals do not appreciate direct TLC; it can be very stressful, potentially even fatal. Imprinting is also a major concern; some species such as corvids and foxes are particularly vulnerable. It is important these animals retain their innate fear of humans, so keeping handling to a minimum and having a no-talking policy around the patient is crucial.

Wildlife will be frightened when taken into care and have varying defensive behaviours. For example, owls will often "play dead" as a defence mechanism. They may on initial inspection appear collapsed, but once you have them casted they may suddenly come to life, so always be aware of those talons.

Know what is normal for that species. A hedgehog out during the day is not normal (unless it is moving with purpose, such as a female collecting leaves for her nest). They are nocturnal and so in most cases, if seen in the day, it is likely they are suffering from a parasitic burden or some other illness/injury (The British Hedgehog Preservation Soceity, 2017). Therefore, it is important to always get a faecal sample from a hedgehog that's out during the day.

It is also important to understand differences in anatomy. For example, grebes and divers do not walk/stand well due to the very posterior position of their hind limbs. Grebes will also only be able to take off once on water. Due to their design, grebes should be housed on water, but when housing in cages is required, thick rubber matting or a towel donut should be used to protect the keel from damage, otherwise the keel will constantly be resting on the ground (Stocker, 2000).

(a)

(b)

Figure 1. (a) How to gently restrain a bird prior to crop feeding; (b) Woodpigeon being crop-fed

Housing and transport

Don't house flighty birds, or transport birds, in wire cages/cat baskets – this can seriously damage their feathers which are integral to their survival. Solid cardboard, plastic boxes or fabric cages are a better alternative. Make sure the size is appropriate for the bird/animal and lined with a towel to provide warmth, comfort and to prevent movement during transport. Ensure there are enough air holes for ventilation. Towels may be used to cover transport containers or hospital cages to help make the animal feel safe and hidden.

Be prepared to transport an animal to an appropriate rescue yourself. Many wildlife rescues run on limited funds with minimal staff. Remember, they are taking on the cost and time of caring for your patient so please be considerate, you never know when you may need them again so treat them well!

Crop feeding

Ensure at least a few nurses know how to crop feed – this could be a life-saving skill. This skill can be acquired through volunteering at a local wildlife rescue. **Figure 1**(a) and (b) demonstrate how a bird may be restrained while administering oral fluids. As shown in **Figure 1**(a), it is beneficial to wrap the bird lightly in a towel so the wings are restrained. Extend the neck, and introduce the tube laterally into the mouth avoiding the glottis; advance the tube caudolaterally along the oesophagus and into the crop which sits at the level of the thoracic inlet. You will be able to see and palpate the tube down the right side of the neck. During administration watch for any signs of regurgitation, if this occurs stop immediately and tilt the bird's head downwards to prevent aspiration (Mullineaux & Keeble, 2016). Always make sure the animal is warm before administering oral fluids. The first feed should always be rehydration fluids and the animal must be warm before administering fluids. When moving onto more substantial formulas, such as Kaytee Exact or Harrisons Juvenille Formula, make sure the formula is not too hot in order to prevent crop burns, but not too cold or too thick that it may lead to crop stasis – follow the manufacturer's guidelines on the back of packet, and never microwave feeding formulas as this is likely to result in "hot spots" in the formula and result in crop burns. **Figure 2** displays some potential feeding tubes available for use in birds. A simple cheap tube can be created from attaching a piece of giving set (cut to the appropriate length so it extends from the bird's beak down to the thoracic inlet) connected to a syringe. Feeding tubes and urinary catheters may also be used and may be useful in species that have a longer oesophagus and require a sturdier, longer tube. Make sure the end of any crop tube is smooth and not sharp to prevent damage to the mucosal lining of the oesophagus. Some tubes are more flexible and may be preferred in more flighty species which may move while the tube is within the oesophagus. Metal crop needles are also available and may be preferred in birds of prey or when proventricular feeding in birds that have crop ruptures.

Diets

Learn some basic/emergency diets – a good resource is a book by Samantha Bedford at Bedfordshire Wildlife Rescue, *A Beginner's Guide to Rearing Wild Birds.*

Identification skills

Have a good reference book at hand. If using the Internet, use trusted sites such as the British Trust for Ornithology. You could also create some identification posters (especially useful for fledgling birds, which often look different to their parents). Nothing beats experience though, so if you can volunteer at some wildlife rescues then this will really help the quick development of identification skills. Identification skills can be important when feeding species; for example, some species such as swifts have very specific diets. ID skills are also important for release purposes. Section 14(1) of the WCA makes it illegal to release or allow to escape into the wild any animal which is not ordinarily resident in Great Britain and is not a regular visitor to Great Britain in a wild state, or is listed in Schedule 9 to the Act (Non-native Species Secretariat, 2017). **Table 2** shows those species on Schedule 9 to which Section 14 applies. Occasionally licences may be granted which permit the release of such species on Schedule 9. Licences may be specific (on a case-by-case basis) or general. For example, barn owls are on Schedule 9, and it is illegal to release a captive barn owl. However, the release of wild barn owls is permitted under a general exemption licence (The Barn Owl Trust, 2015). Licences can be granted to a particular person in compliance with specific conditions (RSPB, 2010). For example, some wildlife centres have a license to release a certain number of Canada geese, and this licence may get revised and renewed annually. There are also certain wildlife establishments that will hold a specific licence to hold and release grey squirrels. This is another reason it is important to get to know your local wildlife centres and learn what they are permitted to take and release. If you are unsure then contact your local wildlife rescue or an RSPCA centre as they may be able to advise a facility that can take your wildlife patient if they are not able to do so.

Handling

Wild animals, even when debilitated, may strike out in defence. Be aware of the dangers to yourself (such as sharp talons, powerful bites and zoonotic disease), but also those you may inflict on the patient by overzealous or inappropriate handling. For example, overzealous restraint in snakes could cause bruising and myoglobin release leading to kidney damage (Girling, 2013). In addition, over-restraint around the thorax of a bird can impede respiration and could be fatal, especially in an already dyspnoeic bird.

Triage – a methodical approach

Check the whole animal; it may have a large wound on its head but it may also have a broken wing, so don't overlook what you can't see straight away. Remember basic first aid.

Pain relief

It should go without saying, but sadly it does occur, if an animal has an injury give it the appropriate pain relief and medication *before* transfer. It is unacceptable for the animal to travel without sufficient analgesia on board.

Advice

Ask for advice! Phone a trusted wildlife rescue/hospital for advice. There is also an excellent Facebook group set up by a very experienced and dedicated wildlife nurse, Lucy Kells, called "Wildlife Advice

Figure 2. Examples of crop feeding tubes

for Vets/RVNs". This forum is strictly for RVNs and Vets. Lucy stresses there is no "silly" question, so please take advantage of this excellent resource and never feel you cannot ask for help and guidance.

Contacts

The most important advice is, if you are unsure, ask. Find yourself a trusted wildlife rescue that you can call on when you are unsure with regards to a wildlife case. Wildlife rehabilitation and veterinary practice do, and should, go hand in hand. As well as transferring animals between us we can be exchanging skills. Wildlife care cannot improve if we work as separate entities. It takes all of us to work together, improve communications and exchange experiences in order to make the treatment of wildlife efficient, effective and appropriate.

Some useful websites to find local rescues/ advice in your area:

www.animalrescuers.co.uk

www.rspca.org.uk/whatwedo/care/wildlifecentres

Facebook page: "Wildlife Advice for Vets/RVNs"

Conclusion

Caring for wildlife is extremely rewarding. Working with other charities and vets, we have the ability to undo some of the impacts we have caused to our environment and the wildlife within it. I really believe nurses can play a crucial role in improving the welfare of wildlife and we should consider it an honour to be able to do just that.

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