

*British Hedgehog
Preservation Society*

**Care and Treatment of
Sick and Injured Hedgehogs**



Part of the

Know your Hedgehog

series

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Note for Hedgehog Carers: it is vital to establish a good relationship with a vet who is happy to treat hedgehogs and to ascertain their practice policy regarding wildlife from the outset. If your vet is not very experienced but interested in treating hedgehogs, a copy of this booklet would be helpful.

Note for Vets new to treating hedgehogs: keep an open mind, go back to basic medical and surgical procedures, remove any orthopaedic implants before release, draw on the experienced carers knowledge of hedgehog behaviour. “Veterinary Care of the Hedgehog” by Ian Robinson and Andrew Routh of the RSPCA, published in ‘In Practice’ March 1999 is very informative, copies available from BHPS on request.

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Our grateful thanks to all the above for their work on this booklet and permission to use their information and drawings.

This booklet and its advice are designed to be used with the European Hedgehog (*Erinaceus europaeus*) in mind, other hedgehog species will have different needs and tolerances.

The British Hedgehog Preservation Society does not take any responsibility for matters arising from the guidance given in this booklet.

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HEDGEHOGS THAT NEED HELP ARE:

Orphaned hoglets - found out of the nest in day, or when the nest has been destroyed and the mother killed or injured.

Injured hedgehogs - with open wounds, fractures, bites, burns, or trapped in some way.

Sick hedgehogs - usually found out in the day, thin, dehydrated, possibly poisoned or with breathing problems.

Hedgehogs that are unsteady on their feet (wobbling, rocking) and ones with flies around them.

Autumn juveniles - young hedgehogs born late in the year, See leaflet 'Autumn Juveniles'.

It is normal for healthy hedgehogs to arouse from hibernation for short periods even in cold winter weather, do not assume these hedgehogs need help unless they are underweight or obviously unwell.

HEDGEHOGS THAT SHOULD BE LEFT ALONE:

Adult females in summer uninjured but found out in daylight (these can be nursing mothers), any large uninjured hedgehogs found (eg. crossing the road) and picked up "for safety" by well meaning people should be put back away from the road but near where found. Bearing in mind that any adult female hedgehog admitted could have dependent hoglets. Keep her stay as short as possible and if necessary give advice to finder about searching for orphaned hoglets.

RELEASING HEDGEHOGS AFTER A PERIOD IN CARE

Choose a release site as near to where the hedgehog was found as is practicable, make sure it is: already inhabited by hedgehogs, away from main roads, badger setts and other hazards. Warm damp weather is best, the provision of food and water for the first few nights might help inexperienced hedgehogs. Further advice on release can be found in the BHPS's "Guidance for Releasing Rehabilitated Hedgehogs" leaflet. Consideration could be given to marking or tagging hedgehogs that have been in care. With public co-operation, this can provide information on what happens to them after release and also facilitates identification of returning patients.

1. CARE

INITIAL EXAMINATION

Very sick hedgehogs may not be rolled up but laying flat and easier to examine thoroughly for wounds, injuries and ectoparasites. If stressed or in pain they may bite, jump and/or hiss/snort. Their spines are often dirty, take care to avoid infection if they break your skin, so it is recommended that you wear (gardening or rubber) gloves. They may shriek if in pain or may self anoint - froth at the mouth and put this saliva over their backs when confronting strange smells or tastes. Self-anointing is normal behaviour.

Even severely injured hedgehogs can stay in a ball and may need anaesthesia for a proper examination. Some suggestions on how to unroll a hedgehog: a) put on heat pad and wait, b) gently stroke its back (as you would a cat) but exerting gentle pressure towards the rear with each stroke to get it to flatten out, c) put on table and wait, d) gently rock it to and fro. Once unrolled, hold onto its back legs and lift its rear end into a “wheelbarrow” position, with the front feet still on the table, this should enable an inspection of its underside.

However care must be taken to ensure that further pain and distress is not caused or that any injuries are not aggravated.

Assessment of general conditions: Is it dehydrated? If you pull up a few spines, does the skin spring back into place when you let go or do they stay put? If the skin does not spring back then it may be dehydrated. Is it well nourished? Is it rounded at the rear end? (well fed) or more like a rugby ball and you can see two lumps where its hip bones are? (very thin). Are its eyes sunk/bright? Are its spines/fur shiny/dull etc? Does it smell –if so it may be hiding an infected wound or have rotten teeth. Decide if / when to see a vet.

PHYSIOLOGICAL PARAMETERS

Body Temperature - 35°C +/- 1°C - much lower in hibernation

Heart Rate - 200 - 280bpm (Rates as low as 2 - 48bpm are reported during hibernation).

Respiratory Rate - 25 - 50/min depending on activity (In hibernation it is possible that hedgehogs may be apnoeic for 1 hour).

WARMTH AND FLUIDS ARE ESSENTIAL

Warmth: A heat pad, heat lamp or a warm, well wrapped, hot water bottle (needs to be frequently filled). Fluids (all given at normal body temperature): orally: Lectade, Duphalyte, Dioralyte, glucose/honey in warm water. International Rehydrating Fluid Recipe: 1 tablespoon sugar. 1 teaspoon salt in 1 litre of warm water fed by syringe into the mouth and also left in bowl instead of water. However when giving fluids orally it is essential that the hedgehog is warm and responsive enough to be able to swallow. Alternatively sterile intra venous fluids can be injected, see Appendix 1. Vitamins are essential if the hedgehog is in poor condition, is not eating or may have been exposed to toxins.

ACCOMMODATION, HYGIENE AND DIET

Housing: All hedgehogs should be provided with a high sided box and nest material (ripped up newspaper) or a towel, with no holes or loose threads, to hide in. This will reduce stress; they should be kept in individual pens/cages, unless found as nestlings with their littermates. White or pale plain towels can be used initially as these will show up any blood or discharge stains previously missed. Hygiene is very important; hedgehogs must be given clean newspaper and bedding at least once a day. Cages/pens should be disinfected at least once a week. Wash your hands before and after handling each hedgehog. Sterilise all utensils and feeding bowls every day.

Food & Water: Hedgehogs need to have water in a non-tippable bowl NEVER give cow's milk, they cannot digest the lactose. Feed specialist hedgehog food or meat based tinned cat or dog food (chicken, turkey, rabbit and lamb "supermeats"). A little cooked chicken (no bones), raw liver or mince can be given as treats. Complete dry meat based cat foods are good for teeth and gums.

Note: Mealworms should only be given in very small quantities. They have very little nutritious value and can become 'addictive' in that hedgehogs will refuse to eat other food and only eat mealworms. In addition it is thought that too many mealworms could upset the calcium/phosphorus ratio in hedgehogs which may result in bone problems. Similar

may apply to other single foods being offered in quantity such as chopped unsalted peanuts and sunflower hearts.

Weighing: The hedgehog will need to be weighed accurately before any dose rates can be calculated. This will also give you a good indication of how it is doing on a day-to-day basis. Keep records of the progress and treatment. Disinfect scale pan and work surfaces etc after each hedgehog.

HAND FEEDING: Adult or weaned juvenile hedgehogs which will not eat for themselves need to be hand fed, either on their back, in a sitting position in your hand, or standing normally on your lap on a (well covered) heat pad. Fluids should be given at body temperature. Very slowly insert the syringe containing either electrolyte replacement fluid (see above) and/or liquid feed into the side of the mouth. This can be a prepared formula from your vet: Hills Prescription Diet A/D, or Reanimyl, Liquivite, Waltham Concentration Diet or you can make your own “glop” by liquidising with water some tinned cat or puppy food mixed with unsweetened baby rusks or cereal with vitamins and pro biotic powder (See appendix 3). Sterilise blender goblet after each use. Depending on the size of the hedgehog give 4-5 feeds per day of 10-30ml. This is calculated as follows: 25% of bodyweight (in grammes) in ml per 24 hours ie a 300g hog would need approx 75ml over 24hrs to gain the ideal of 10g per day. Gradually reduce the hand feeds as it begins to eat enough to gain weight.

Unweaned hoglets should be given 2/3 fresh goats milk , 1/3 goats colostrum or a puppy replacement milk at body temperature, 2-4 hourly depending on age and gain about 4g per day. Stimulation of the ano-genital area is vital so they empty their bladder at each feed. See BHPS leaflet Caring for Hoglets.

A list of useful items to have when caring for hedgehogs is to be found at the end of this booklet.

ECTOPARASITES AND OTHER SKIN PROBLEMS

Fleas: some wild hedgehogs carry large numbers of specific hedgehog fleas (*Archaeopsylla erinacei*), these do not appear to harm healthy hedgehogs and will not stay on humans, pets or infest your house, as they breed in the hedgehog's nest. Sick, hypothermic, hedgehogs do not seem to have large number of fleas as they hop off in search of warmth. Severe infestation can cause anaemia. Hedgehogs with flea problems can be dusted with pyrethrum based flea powder suitable for caged birds on arrival, this single treatment should be all that is needed. Most of the aerosol sprays used on cats and dogs should not be used as they may be too toxic to the hedgehog. Any product used for caged birds should be safe if used sparingly on hedgehogs. Make sure you avoid their faces when applying any product.

Ticks: can be found anywhere on a hedgehog's body, particularly around the eyes, ears and tail. Severe infestation can cause anaemia. *Ixodes hexagonus* is the most common species found on hedgehogs. They suck blood and drop off into the nest when fully fed. Care is needed in removing them. See notes on tick removal on our website in the rehabilitators area or request our "Notes on Tick Removal". Clean the area with Calendula or disinfectant after removal.

Maggots and fly eggs (Myiasis): found usually in warm weather in wounds but also on weak, sick, uninjured hedgehogs. Check all orifices, eyes, ears, nose, mouth, anus, and around the tops of the legs. Maggots should be removed with tweezers, or from wounds with a dental water-jet. A 1:250 concentration of F10™ Antiseptic Solution (concentrate) can be applied topically. All dead maggots must be removed from wounds. Fly eggs can be brushed off the spines with a toothbrush and removed from fur with a flea comb, flushed from ears, mouth, anus etc with salt water in a syringe (dissolve 1 teaspoon of salt in a pint of hot water and allow to cool). Use Optrex or similar to flush the eyes. If there may be maggots left in the ears some olive oil might bring them to the surface.

Mites: Hedgehogs may suffer with several species of mites. They may look like dust particles and cause the skin to become flaky, scabby or crusty and spines and/or fur may fall out.

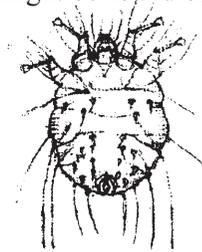
Surface mites (*Caparinia tripilis*, *Chorioptes* spp., *Notoedres cati* etc) : Pyrethrum powder, cleaning bedding and vitamin supplements may be all that is needed.

Deep skin mites (*Demodex erinacei* and *Sarcoptes* spp.) : Ivomec 0.3ml/kg weekly for 4 weeks or Ivomec solution 1:30 topically or Amitraz bath x 2-4 treatments at 10 day intervals. Deep infestations like *Demodex* do not respond well to drug treatments.

Below are two different types of mange mites that might be found on a hedgehog when using a microscope.



Demodex



Sarcoptes

Ear mites: use Canaural drops or Otodex.

FUNGAL INFECTIONS: Ringworm: Dry white flaky skin, especially round the face, thickened “cauliflower” ears may be signs of hedgehog ringworm *Trichophyton mentagrophytes* or *erinacei*, which does not fluoresce under a Woods lamp and needs to be diagnosed by culturing a sample. Note this fungus can be transmitted to humans, so proper precautions should be taken (eg gloves).

Imaverol baths x 2, 1ml/50ml water 10 days apart, Mycophyt baths x 2, 10 days apart (See Appendix 2). Garlic juice or tea tree oil is said to kill ringworm spores.

Vitamin supplements, particularly Vitamin A with Zinc (Vitamin + Zinc) and Evening Primrose Oil for falling spines, wheat germ oil to boost the hedgehog’s general condition. Ringworm can take up to 6 weeks to clear up.

ENDOPARASITES

Strong hedgehogs live with a moderate number of parasites in the wild, but in a young or weak animal they can lead to death. Often hedgehogs get worms by eating infected prey, eg snails, slugs and earthworms so it is inadvisable to feed captive hedgehogs with 'wild' food; live mealworms (see note about mealworms on page 3), beetles etc can be obtained from pet shops or mail order. The aim is to release with a "background level" of internal parasites that the hedgehog can cope with, a "squeaky clean" juvenile will quickly become heavily infested once back in the wild and may not be able to cope with such a sudden burden. Capillaria can be transmitted directly from faeces without an intermediate host, this is also true of Coccidia, so hygiene is very important. A microscope is essential to determine which endoparasites are present. See Appendix 1 for techniques. Mixed parasite infestations are frequent and may vary according to region/climate/weather. In cases of severe infestations, antibiotic cover should accompany any worming. Dosages and choice of wormers and antibiotics vary. Under veterinary supervision choose a regime that works for your hedgehogs.

It should be remembered that there is not a worming drug that kills all the worms that hedgehogs are likely to have. Some drugs are more effective in killing some worms and less effective with others. Fenbendazole (Panacur) can be used for flukes, Nematodes, Tapeworms and Capillaria (lungworms) but is not very effective. Mebedazole (Telmin) is effective for flukes, Nematodes, Capillaria and Crenosoma but is less effective against Tapeworms. Praziquantel (Droncit) is effective for treating Fluke, Tapeworm and Thorny Headed Worm. Levamisole (Levacide) is most effective against Crenosoma, Nematodes and Thorny Headed Worm but less effective against Capillaria. Ivermectin (Ivomec/Panomec) is effective against Capillaria. In most cases it is not necessary to kill all the worms just to get them down to a level that the hedgehog can cope with - once in the wild (or if fed on natural food like earthworms, slugs and snails) it will become re-infected.

LUNGWORM

Crenosoma striatum (lungworm) and *Capillaria aerophila* (lung threadworm) cause wheezing, coughing, gurgling, snuffling, respiratory distress and loss of appetite and weight. Frequently linked to secondary bacterial infection and profuse mucus secretion in airways, dead worms, eggs and larvae must be coughed up or they will block the airways and may cause death. *Crenosoma striatum* is reported to be a major cause of mortality in Europe.

Breathing difficulties can also be caused by nose injuries, dental problems or rhinitis. As a very general guide noise on inspiration will be related to disease of upper airways eg nose, trachea and noise on expiration is more likely to relate to disease of lungs and lower airways.

The following wormers are used widely in Europe for lungworm and seem to work, see Appendix 2 for alternative dose regimes.

Levamisole: (Levacide) 27mg/kg 2 injections sub.cut. 48 hours apart. Do not inject near the head or give to pregnant hedgehogs or to unweaned babies. With young/weak hedgehogs under 300g split the daily dose into 2 and give half in the morning and half in the evening. (Pro Igel)

Mebendazole (Telmin KH) (may cause diarrhoea in weak hedgehogs) for 5 days crushed on food or in liquid feed: <200g 1/8 tablet; 200-500g 1/4 tablet; 500g-1kg 1/2 tablet;

Fenbendazole (Panacur) dosages vary-very gentle wormer, not particularly effective.

Ivermectin is effective against capillaria.

As lungworm infestation is nearly always associated with bacterial infection appropriate antibiotic cover should be given under veterinary supervision (see Appendix 2).

Milophyline sub cut (Appendix 2) and Bisolvon powder (pinch per day) in liquid feed or on food for up to 14 days may also be useful to dissolve mucus and bring up dead worms. Steroids may have a limited use under veterinary advice. (Appendix 2).

INTESTINAL WORMS

Capillaria erinacei, ovoreticulata – intestinal threadworms

Brachylaemus erinacei – hedgehog intestinal fluke

Hymenolepis erinacei – tapeworm

Acanthocephala – thorny headed worm

All cause loss of appetite and weight, diarrhoea, anaemia, possibly enteritis with blood in droppings. Fluid and electrolyte replacement therapy will be necessary in hedgehogs with no appetite. Fluke can cause extreme hyperactivity and lead to death, as can Coccidia, mixed infestations are common.

Wormers for intestinal worms:

If possible a faecal examination should be undertaken first to determine what parasites are present. If this is not possible try the Levamisole doses suggested below initially and if the hedgehog does not respond start the Ivermectin. It may be possible for a large wildlife centre to check droppings if you have no other option, contact BHPS for details if necessary.

Intestinal Capillaria: Levamisole, Mebendazole, Fenbendazole dosage as for lungworm above. Fluke/Tapeworm/Thorny headed worm: Praziquantel (Droncit) <200g 1/8 tablet, <500g 1/4 tablet, >500g 1/2 tablet or injectable, or <200g 0.1ml, >200g 0.2ml, >500g 0.4ml – 0.5ml/kg one dose – may be needed to be repeated in stubborn cases.

As with lungworm infestations, intestinal worms are frequently associated with bacterial infections of the gut, antibiotic cover is recommended see below Intestinal Bacterial Infections.

Suggested Autumn Juvenile worming regime

In the wild there is a high mortality amongst autumn juvenile hedgehogs. Consequently, some hedgehog rehabilitators are choosing to routinely worm autumn juveniles on arrival, others think because there are so many different drugs needed depending on what parasites are present so you need to identify what they have before you can treat it. **Routine worming**

is not recommended but faecal samples should be checked for eggs and larvae under a microscope when the hedgehog is first admitted and then periodically after that, especially if one that has been gaining weight well starts to drop weight on a daily basis.

Remember it is important to keep hoglets warm, perhaps with a heat pad, until they are at least 200gms. If cold they will not eat.

Lungworm can cause wheezing, coughing, gurgling, snuffling, respiratory distress and loss of appetite and weight. Frequently linked to a secondary bacterial infection and profuse mucus secretion in airways, dead worms, eggs and larvae must be coughed up or they will block the airways and may cause death.

There are a number of different worming regimes that rehabilitators use, this may be because certain worms are more prevalent in certain areas so different regimes have been developed to cope with local variations.

The following is widely used and currently appears to work:

If Crenesoma (larvae) are found in a sample, give Marbocyl 2% @0.4ml/kg daily by s/c injection for 7 days, Baytril can be used but must be administered twice daily (dosage depends on strength of Baytril).

Levamisole: (Levacide) 27mg/kg (0.35mls/kg) sc daily for 3 days, leave a 10 day break and then repeat for 3 more days. Recalculate dose at this point as weight should have increased. It is not necessary to dilute this before giving. Do not inject near the head, or give to pregnant hedgehogs or to unweaned babies. With young or weak hedgehogs under 300gms split the daily dose into 2 and give half in the morning and half in the evening and give on day 1 and day 3. Slightly different doses and repeat times are also being used successfully. It is for your vet to decide which dose they use. Repeat the levamisole doses 10 days after the previous course has ended (remember to re weigh and calculate the dose as hopefully the hedgehog will have put on weight). It is not usually necessary to repeat any of the other drugs unless symptoms suggest this is required. This also is the drug and dose to use for the increasingly common 'Thorny-headed' worm.

If Capillaria (eggs) are found in a sample, Ivomec Super/Panomec @0.4ml/kg should be given weekly by s/c injection for 3 weeks. Recalculate dose each week as weight should have increased. As lungworm infestation is frequently associated with a bacterial infection appropriate antibiotic cover should be given under veterinary supervision. For example, Marbocyl 2% @ 0.4ml/kg s/c for 7 days or Baytril 2.5% @ 0.8ml/kg twice daily sc or im for 7 days. If Coccidiosis is suspected Baycox Oral Suspension 100mg/kg (=2ml/kg) orally (can be mixed with small amount of food) single dose repeat in 10 days **OR** Tribissen 24% sc injection (0.5ml/kg) daily for 7 days.

Bisolvon could also be used to shift mucus and bring up dead worms if the hedgehog is showing signs of a heavy lungworm burden (e.g. breathing is affected or it has a raspy cough) Administered by injection @ 1ml/kg sc injection for 7 days.

Recent studies at VWH have shown a greater success rate when Dexamethasone (2mgs/ml) (a short acting anti-inflammatory drug) is used when the hedgehog has problems breathing, at a rate of 0.5ml/kg twice daily for 3 days.

For Fluke, Profender Spot-on for cats at 0.5ml/kg on skin of underbelly once a week for 3 weeks can be used.

In most cases fluid therapy (by s/c injection) and hand feeding will be required. If the hedgehog is particularly young, sick or weak it should be kept on a heat pad throughout the treatment.

Do not feed hedgehogs on their natural food as this can result in re-infection. A meaty cat or dog food is ideal, along with cat complete biscuits, you might like to add a little bran to the mix as roughage. Puppy food liquidized with water or Royal Canin Kitten Mousse with water is recommended for particularly young or sick hedgehogs. Make sure fresh water is available at all times. Mealworms are not recommended as a) hedgehogs can become addicted to them and will refuse any other food, and b) they have very little nutritional value and can actually strip calcium from the hedgehog due to the calcium/phosphorous ratio in them. That

said, a small number of fresh mealworms can be useful to tempt fussy eaters to eat, as long as not given over a prolonged period.

Note the hedgehog may cough more after worming than it was before – this usually means that the worms are dying and being coughed up which is what you want – it does not necessarily mean that the hedgehog is getting worse.

Regular Faecal sampling is important to make sure nothing is missed and that the correct drug is used. Remember that eggs/larvae/oocysts are not shed in every sample so a clear examination does not necessarily mean that no parasites are present.

Refer to the formulary at the back of this booklet or Vale Wildlife Hospitals (VWH) drug regimes for drug doses of these and other drugs frequently used on hedgehogs. Visit the websites: www.britishhedgehogs.org.uk and www.valewildlife.org.uk

BHPS has a worm identification chart available on request.

INTESTINAL BACTERIAL INFECTIONS

Many different types of bacteria are associated with intestinal infections including E Coli, Salmonellae, Klebisiella, Leptospira, Campylobacter and Proteus. NB many of these are transmittable to humans – good hygiene is essential! Some of these bacteria can be very resistant and sensitivity testing is recommended.

Antibiotics: Potentiated sulphonamides or enrofloxacin, amoxicillin/clavulanate (Suggested doses in Appendix 2) accompanied by Buscopan for cramps/squealing, fluid therapy is essential, Pro biotic powder, digestive enzyme, vitamins and Kaolin.

PROTOZOA – Coccidiosis – *Isospora rastegaivae* is the most common in hedgehogs. Can be brought on by stress, is infectious to the same or other hedgehogs from faeces in 48hrs if sporulated otherwise 6-10 days. Hygiene is very important. Distinctive dark green droppings sometimes with blood,

also restlessness and spine/fur loss.

Treatment: Sulphadimidine or potentiated sulphonamides (See Appendix 2) in persistent cases a 15 day course of 5 x Sulphadimidine, 5 x potentiated Sulphonamide, 5 x Sulphadimidine may work. Baycox is also being used.

VIRUSES: German literature suggests that feline parvoviruses may be transmissible to hedgehogs in rescue centres where cats and hedgehogs are cared for in close proximity, good hygiene will prevent this.

URINARY PROBLEMS: appear to be relatively uncommon in hedgehogs but kidney failure has been seen in older animals. These will appear to drink a lot and pass copious amounts of urine. They are difficult to treat but a lower protein diet and antibiotics, cephalexin, or trimethoprim potentiated sulphonamides may be helpful. Lower urinary tract infections also occur, symptoms may be thick, discoloured urine and the hedgehog may squeal while urinating. Treatment can include cephalexin, trimethoprim potentiated sulphonamides and pain relief/anti inflammatories.

2. VETERINARY TREATMENT

WOUNDS, INJURIES, FRACTURES, AMPUTATION

For anything other than surface wounds veterinary treatment or advice will probably be necessary. With any serious injuries, consideration must be given as to whether the hedgehog will be fit enough to be released after treatment.

Open wounds: first aid: clean wound (dissolve a teaspoon of salt in a pint of hot water, allow to cool) and remove fly eggs and maggots. Flush several times with sterile saline, use Intrasilite gel or Aloe Vera Jelly for dressing. Veterinary treatment may include, cleaning, debriding and suturing. When cleaning and debriding wounds it is important to clip enough spines to allow proper cleaning but it should be kept in mind that the spines will only regrow after the base of the old spines falls out. If large areas are clipped the hedgehog will be vulnerable to predators until they regrow. Antibiotic cover: clavulanate potentiated amoxicillin, cephalixin, enrofloxacin. Fluid therapy as required. It is very common in hedgehogs for wounds to “track” beneath the skin because of loose connective tissue. Catheters may be required to flush the full extent of these wounds.

Ligatures: wire, netting, string, elastic bands, plastic all seem to trap hedgehogs, even if there is no obvious wound, pressure necrosis can occur and infection can break through the skin at a later date so keep in for observation for at least a week. Ligature wounds should generally not be sutured but cleaned and allowed to granulate and heal. Watch out for self mutilation as the feeling returns to the limb.

Balloon Syndrome: Hedgehog has blown up appearance, subcutaneous emphysema. There is no single cause for this condition. The air can be removed by incising or aspirating through the skin over the back. Antibiotic cover should be given. This may be associated with lung/chest wall damage or a small external wound acting like a valve or a clostridium type infection.

Pop-off Syndrome: A condition so named by Les Stocker of St Tiggywinkles, “when the spiny skin is pushed up over the hedgehog’s haunches with the orbicularis muscle springing tight and preventing the skin from returning to its normal position. When this happens the hedgehog’s legs are forced sideways, and anal orifice and tail are pulled up over the back and the hedgehog is completely helpless. Check that the hedgehog does not have a spinal injury by pinching its toes, if there is no reaction an X ray will be necessary. If it flinches, the orbicularis muscle can be pulled back into position under anaesthetic. Note this is not a life threatening condition so treat for shock, hypothermia and dehydration before administering an anaesthetic. This can occur when the hedgehog gets trapped and in its efforts to free itself, the orbicularis muscle pops over the pelvis and the hedgehog cannot get it back in place itself.

Leg Fractures: Simple fractures may be put in plaster. Treatment for more complicated fractures can include excision arthroplasty, or internal and external fixation.

Sometimes the leg is so badly infected that amputation is the only solution. Amputations should be performed in the proximal limb e.g. proximal third of the femur, proximal third of the humerus or shoulder joint because stumps are easily traumatised. Hedgehogs with limb amputations are generally considered as candidates for life in an enclosed garden (contact the BHPS for up to date information on this). There are some concerns that hind limb amputees are unable to groom properly and are more subject to mite infestations, while front leg amputees can have mobility problems. Some vets prefer to euthanase rather than condemn a wild animal to a life of captivity.

Paralysis, spinal fractures: The spines may be lying flat across the back from the point of injury, hind limb paralysis may be evident. Nerve or muscle damage may correct itself in time; treatment is the same as for spinal injuries in other species. Where a decision is made to treat these cases manual bladder emptying will be necessary if the hedgehog is unable to urinate – it is essential to monitor both the urine and faeces output. Some time limit should be set if conservative treatment is not working. Female hedgehogs with

pelvic damage may have problems giving birth. Discuss this with your vet before considering release. A demyelination disorder has been recorded in hedgehogs “Paralysis in hedgehogs associated with demyelination” Veterinary Record (1998) 143 .550-552.

Head injuries: frequently affect eyes, nose, ears and jaws. Blind hedgehogs should be kept in captivity provided they settle into an escape proof garden. The decision should be made with your vet, taking into account the overall condition, age and sex of the hedgehog. Male hedgehogs may be less tolerant of captivity. Surgical removal of damaged eyes is possible.

Circling: can be due to central nervous disease or more commonly middle ear infection. Blind hedgehogs may also circle.

Nose injuries: caused by strimmers etc or bites, permanently reduced sense of smell due to damaged turbinate bones may inhibit foraging ability in the wild. Give fluids sc until the hedgehog can accept liquid feed, hand feed until it can smell enough to eat for itself. Olbas oil and inhalations (eucalyptus and menthol) to ease breathing. Carprofen to reduce swelling and antibiotic cover. Surgery to repair nasal wounds should be undertaken with care, hedgehogs appear to get very swollen nasal mucus membranes even after quite minor surgery and have reluctance or inability to breath well thorough their mouths as a result they can be very dyspnoeic and even die following nasal surgery. Nose injuries are very painful and often those involving the nasal cavity either do not heal or take a long time to heal.

Fractured jaw: it is possible to repair some jaw fractures by wiring, hand feeding will be necessary.

Teeth: Juvenile hedgehogs can stop eating and appear to “lose” an eye due to persistent milk teeth, when removed the hedgehog quickly returns to normal. Prolonged captivity may result in a build up of tartar and gum disease, however, varied diet including some hard cat biscuits (complete food) may help reduce this problem. Adults brought in from the wild can have horrible dental problems.

ANAESTHESIA AND ANALGESIA:

The preferred method of anaesthetising hedgehogs is in a small animal anaesthetic chamber using Isoflurane. Halothane is also used but appears to have a smaller safety margin. If the hedgehog will partially unroll it is often possible to anaesthetise it using a small mammal mask or a soft wide anaesthetic tube over nose and mouth.

Endotracheal intubation is possible following induction with injectable agents or in a chamber, using a stylet and an uncuffed tube (2.0mm/2.5mm/3.0mm/3.5mm –depending on size of hedgehog). This is preferable for longer procedures and for surgery on nose or mouth, and is easier than endotracheal intubation in rabbits.

For minor procedures and induction Ketamine is useful in combination with Diazepam, Midazolam, Medetomidine or Xylazine – See Appendix 2 for doses. NB Many hedgehogs have lungworm and pulmonary infections/abscesses that may not be initially obvious and respiratory depression associated with Fluanisone+Fentanyl or Medetomidine/Xylazine can lead to complications.

Analgesia: Carprofen (Rimadyl) Pfizer, Buprenorphine (Temgesic). Lignocaine 2% + Adrenaline various small volumes for local anaesthesia – See Appendix 2 for doses.

POISONING: Hedgehogs are liable to encounter the same poisons as cats and dogs and are treated the same. Vitamin K for Warfarin poisoning. The German literature suggests Vitamin K for 5 days at 10mg/animal. Pesticide poisoning is hard to diagnose unless the agent can be identified and a specific antidote administered. Metaldehyde – charcoal and anaesthesia, intraperitoneal/intraosseous fluids and calcium gluconate. Atropine can be given to counteract anticholinesterase products, and no milk or oils to be given. Strychnine – anaesthesia. Thallium - diphenylthiocarbazon (70mg orally).

OIL, TAR, BURNS: Oil can be removed with warm water and washing up liquid, absorb with Fullers Earth powder, keep warm until dry. Tar can be removed with Swarfega. Burns – apply clean cold wet towels and go the vet. Fluid therapy is also vital – keep hedgehog warm against shock. Chemical burns – wash well. Alkali burns eg lime – water/vinegar 50/50; acid burns 3 tbs baking soda in 2¼ litres warm water, cover with sterile gauze dressing and give electrolyte replacement and antibiotics.

CONGESTIVE HEART FAILURE: This does occur in hedgehogs. Systolic murmurs can be heard if the rest of the respiratory sounds are not too loud. Frusemide and ACE inhibitors have been used with some success to treat pulmonary oedema or ascites Endocardiosis of the A-V valves is the most frequent finding in Jersey on those that have had a post mortem examination. A-V valve dysphasia has also been found on one occasion.

Hedgehog Rehabilitation is an excellent book, written by Kay Bullen and published by the British Hedgehog Preservation Society.

It is a guide to the rescue, rearing, nursing, care, diagnosis, treatment, welfare and release of the hedgehog *Erinaceus europaeus*.

The book is available for £12 + £3.95 P&P (per copy).

To order please Contact BHPS

APPENDIX 1: TECHNIQUES

INJECTIONS: Carers should learn the technique under veterinary supervision. Subcutaneous injections: lift a small fold of spiny skin on the back or flank and inject into the connective tissue at the base of the “pleat” formed, parallel to the body. Intramuscular injections into the front of thigh (quadriceps group). Injections into the back of the thigh can cause irreversible nerve damage. Intramuscular injections can also be made into the orbicularis muscle. Performing any invasive procedure on an animal is governed by legislation. Any carer considering this should discuss it with their veterinary surgeon.

FLUID THERAPY: Fluids should be given at body temperature.

Oral fluids via a syringe – always give time for hedgehog to swallow. Fairly well tolerated if fluid/food is palatable.

The following methods should be carried out by a veterinary surgeon unless the rehabilitator has been properly trained in the techniques.

Subcutaneous fluids – relatively easy – 2-3ml for small hedgehogs and up to 10ml for larger hedgehogs at any one site.

Intravenous fluid therapy is difficult - jugular or femoral veins in collapsed hedgehogs. In larger hedgehogs it is occasionally possible to establish an i/v line in the cephalic vein. If this is done the propofol can be used for anaesthetic induction - see Appendix 2.

Intraosseous fluids – via tibia – many other sites eg. trochanteric fossa of the femur are covered by spines and not easily accessed.

Intraperitoneal fluid – relatively easy – via posterior left or right quadrant of abdomen.

Nasogastric tube - these appear to be fairly well tolerated but need to be securely fixed. Technique as for a cat.

FLUID REPLACEMENT CHART (50ml/kg)

WEIGHT (gms)	DAILY MAINTENANCE (mls)	+	FLUID DEFICIT 5%	FLUID DEFICIT 10%	FLUID DEFICIT 15%
		add to			
50	2.5mls	+	2.5mls	5mls	7.5mls
100	5	+	5	10	15
150	7.5mls	+	7.5mls	15	22.5mls
200	10	+	10	20	30
250	12.5mls	+	12.5mls	25	37.5mls
300	15	+	15	30	45
350	17.5mls	+	17.5mls	35	52.5mls
400	20	+	20	40	60
450	22.5mls	+	22.5mls	45	67.5mls
500	25	+	25	50	75
550	27.5mls	+	27.5mls	55	82.5mls
600	30	+	30	60	90
650	32.5mls	+	32.5mls	65	97.5mls
700	35	+	35	70	105
750	37.5mls	+	37.5mls	75	112.5mls
800	40	+	40	80	120
850	42.5mls	+	42.5mls	85	127.5mls
900	45	+	45	90	135
950	47.5mls	+	47.5mls	95	142.5mls
1KG	50	+	50	100	150

Grateful thanks to Vale Wildlife Rescue for their permission to use the fluid replacement chart.

Amounts to give:

It must be remembered that the amount of fluids you administer has to be an amount to counteract dehydration/fluid loss PLUS the normal daily amount required (maintenance rate).

In order to work out the correct amount the hedgehog must be weighed accurately.

To work out the amount of fluids needed you first need to assess the degree of dehydration.

Clinical signs for varying degrees of dehydration include:

5% dehydration – some minor tenting of the skin, dry lips and gums, slightly sunken eyes

10% dehydration – prolonged skin tenting, dry lips and gums, pale gums and prolonged Capillary Refill Time CRT (press the gum and see how long it takes for the white gum to turn pink). Try it on your own gums.

15% dehydration – collapse, severe shock, death imminent.

The chart gives a daily dose over a 24 hour period. After 24 hours reassess the degree of dehydration and re weigh the casualty so you can adjust the dose for the next 24 hours accordingly.

The hedgehog may require fluids 5 or 6 times a day to give the full 24 hour requirement. It is probably best to keep the total fluid injected at one site to around 10mls at a time for the smaller hedgehogs although very small hedgehogs should have less and larger ones can take more.

If a hedgehog is presented in a debilitated state assume it has lost 15% of its total body fluids.

However, if in doubt, assume all casualties require fluid therapy even if at first they do not appear dehydrated. One exception might be a young female about to give birth as they sometimes come out in the day not knowing what is happening and are picked up and taken into care.

BLOOD SAMPLING: This is not an easy technique. The jugular or femoral vein can be used in the anaesthetised hedgehog. Enough blood for a smear can be obtained from a nail.

Haematology	Range	Units
RBC	4.49 – 6.41	10 ⁶ /mm ³
PCV	0.30 – 0.45	%
Haemaglobin	9.9 – 16.3	mg/dl
WBC	5.5 – 17.1	x 10 ³ /mm ³
Neutrophils	1.43 – 11.7	%
Lymphocytes	2.3 – 5.1	%
Eosinophils	0.47 – 1.87	%
Monocytes	0.06 – 0.58	%
Basophils	0.07 – 0.69	%
Reticulocytes	<0.8	x 10 ³ /mm ³

Biochemistry

Total protein	44 – 62	g/l
Albumin	21 – 31	g/l
Globulin	16 – 32	g/l
Glucose	1.3 – 5.9	mmol/l
Urea	2.9 – 12.7	mmol/l
Creatinine	0 – 71	umol/l
Bilirubin – total	<7	umol/l
Cholesterol	2.7 – 3.9	mmol/l
Calcium	1.45 – 2.55	mmol/l
Phosphorus	1.07 – 2.17	mmol/l
Sodium	121 – 141	mmol/l
Potassium	3.0 – 6.0	mmol/l
Chloride	90 – 106	mmol/l
Alk Phos	20 80	IU/L
AST	1.0 – 79.0	IU/L
ALT	22 – 70	IU/L
Amylase	<1500	IU/L
CK	<360	IU/L
LDH	<490	IU/L

(Values provided by Greendale Labs Ltd)

FAECAL EXAMINATION

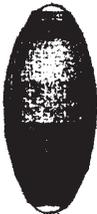
The quickest and easiest method is a direct smear of faeces onto a microscope slide with a drop of tap water spread out to the size of the cover slip and examine microscopically. Any sick hedgehog will have such a heavy parasite burden that this method is adequate to ascertain what treatment to give. Faeces should be checked on arrival and every other day for 2 weeks, thereafter weekly unless condition deteriorates.

Concentration methods are described in laboratory technique manuals. Dora Lambert has compiled this summary to show what method to use to find hedgehog endoparasites.

Procedure:	to find:
Sedimentation	Brachylaemus eggs Capillaria eggs Acanthocephala eggs
Flotation	Capillaria eggs Coccidia Oocysts Crenosoma larvae Tapeworm eggs
Baermann funnel	Crenosoma larvae

We have a free worm identification chart available - please contact us.

The following are pictures of parasitic evidence you might see under the microscope:



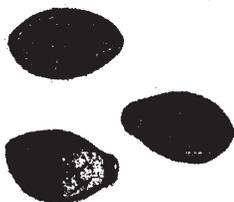
(egg x 450 approx)



Larvae

Capillaria worm eggs and
Crenosoma larvae.

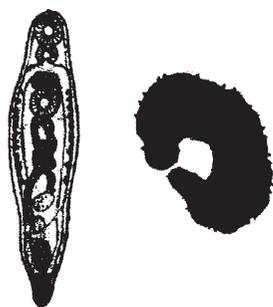
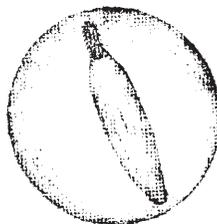
Brachylaemus (fluke)



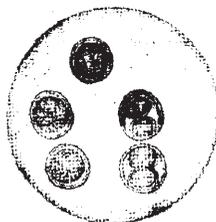
Eggs (x480 approx)

Thorny headed worm - below

Acanthocephala
(x5 approx)



Female (x8
approx) Coiled
female (x8 approx)



Isopora (x300 approx)

Visible objects like small grains of rice may be tape worm egg sacs.

FORMULARY

The dose rates in this Formulary have been gained from practical experience from a number of sources. The drugs at these dose rates appear to have therapeutic effects without causing adverse reactions. However, none of these preparations have a product licence for use in hedgehogs. The British Veterinary Association cascade should be adhered to when using the Formulary.

APPENDIX 2

Generic name *Antibiotics/Antibacterial drugs*

Generic name	Trade name	Manufacturer	Dose	Frequency	Route	Source
Amoxicillin	Clamoxyl Palatable Drops	Pfizer	40mg/kg	twice daily	oral	
Amoxicillin 15%	various	various	150mg/kg	sid 5days	sc	Pro Igel
Amoxicillin L/A	various	various	150mg/kg	ev 2 days	sc im	St Tigs
Amoxicillin L/A (150mg/ml)	Clamoxyl	Pfizer	100mg/kg	every other day	sc im	Vale
Amoxicillin/Clavulanate	Synulox	Pfizer	30-50mg/kg	bid	oral im sc	IR/AR
			100mg/kg	sid at least 7 days	sc im	Vale
			150mg/kg	bid	oral	St Tigs
Cephalexin	Synulox pal drops	Intervet	30mg/kg	sid	sc	JHPG
		Intervet	30mg/kg	daily for 7 days	oral sc im	Vale
Clindamycin	Antirobe	Pfizer	5-10mg/kg	bid	oral	IR/AR
			20mg/kg	bid	oral	ST Tigs
			25mg/kg	daily for 7 days	oral	Vale
			12.5mg/kg	daily for 5 days	oral	
Enrofloxacin	Cleorobe 25mg Baytril	Upjohn Bayer	10mg/kg	bid	sc im oral	IR/AR
			20mg/kg	bid 7 days	sc im	Vale
			12.5mg/kg	daily for 5 days	sc	Pro Igel infected wounds
			2.5mg/kg	sid 3-5 days	sc	Pro Igel chest infections
Marbofloxacin (comes in 1% + 2% soIns)	Baytril Marbocyl	Bayer Vetoquinol	4mg/kg	sid	oral im	KB
			8mg/kg	daily for 7 days	sc	Vale
Metronidazole	Stomogyl Flagyl	Rhone Merieux	1/2 tab/kg	sid	oral	St Tigs dental conditions
			40mg/kg	daily for 5-10days	oral sc im	Vale
Oxytetracycline (if using a 10% solution dilute to 5% before injecting ie mix 50:50 with sterile water)	Engemycin 5%	Intervet	50mg/kg	twice daily for 7days	oral sc im	Pro Igel
			50-100mg/kg	sid 5 days	sc	JHPG
Sulphadiazine/Trimethoprim	Tribrissen 24%	Schering-Plough	30mg/kg	sid 5-8 days	im sc	JHPG
			0.5/ml/kg	daily for 7 days	sc	Vale
Tylosin	Tylan	Elanco Animal Health	10mg/kg	sid	im	JHPG
			20mg/kg	daily for 7 days	sc im	Vale

Generic name	Trade name	Manufacturer	Dose	Frequency	Route	Source
<i>Anti-parasitic drugs</i> Endoparasiticides	see note at the end of this appendix see also paragraphs on worms and Coccidia pages 7-10					
Flubendazole	Flubenol 5% (powder)	Janssen Health	100mg/kg <500gms 1gm >500gms 2gm	daily for 5 days repeat in 10 days sid 5 days sid 5 days	oral oral oral	Pro-Igel Pro-Igel
Levamisole (see notes at the end of appendix and page 10 autumn juvenile worming regime)	Levacide	Norbrook	20mg/kg 27mg/kg 27mg/kg	x3 1 wk apart with bronchial dilators x3 24hrly intervals x3 24hrly intervals, repeat this from day 13	sc sc sc	St Fligs IR/AR Vale
Mebendazole	Telmin KH	Janssen	100mg/kg 100mg/kg <200gms give 1 eighth tablet 200-500gms give 1/4 tablet 500-1kg give 1/2 tablet	x5 days - repeat in 10 days 5-7 days for 5 days may cause diarrhoea	oral oral oral	BHPS/JD Vale
Praziquantel (dilute to 1%)	Droncit inj. Droncit inj.	Bayer	7.5mg/kg 28.4mg/kg 0.4ml=22.72mg	x1 x1 x1	im sc	St Fligs Pro-Igel
	Droncit 50mg tab		10mg/kg 25mg/kg 15mg/kg	x1 x1 repeat in 10-14 days	sc sc oral	JHPG (repeat if necessary) BHPS for tapeworm Pro-Igel
Sulphadimidine (dilute to 1% before injecting by adding sterile water - 1 part Intradine to 2 parts sterile water)	Intradine 33.3%	Norbrook	Dose = 110mg/kg sid on day 1 then 55mg/kg sid 2-5 and 11-15	repeat in 10-14 days	sc	JHPG
Toltrazuril (50 mg/ml oral suspension)	Baycox	Bayer	100mg/kg (2ml/kg orally)	Single dose - repeat in 10 days	oral	Vale
Ectoparasiticides	See also paragraphs on Ecroparasites pages 5-7 and note at the end of this appendix					
Amitraz	Ectodex bath	Hoechst Roussel	2 baths	10 days apart		Pro-Igel
Amitraz	Aludex	Various	0.3% solution	once a week for 2-3 weeks	topical	JHPG
F10			1:250 concentration spray over the site	max of 5 applications per animal with multiple wounds	1-2 trigger pulls (1-2ml per wound)	repeat as necessary
Ivermectin - see notes at end of appendix	Ivomec	MSD	0.2-0.4 mg/kg x3 weekly use sparingly mix 1:9 dilute 1:9 dilute	0.4ml/kg dilute 1:9 propylene glycol with water for maggots for mange not lungworm few drops	sc sc topical	St Fligs St Fligs IR/AR IR/AR
	Panomec	Merial	10mg/ml - 1:30 dilute 3mg/kg	spray sparingly once only stable hogs x1	sc	Pro-Igel
		MSD	<500gms = 0.05 ml, or >500 gms = 0.1	3 injections 1 week apart	sc	Pro-Igel for lungworm
Permethrin Pyrethrins/Pipeonyl Butoxide or any simular drugs used on small caged birds should be a safe treatment for hedgehog fleas and biting (visible) mites.	Insecticidal powder	Johnsons	one light dusting for hedgehog fleas and biting (visible) mites.	topical	sc	BHPS for mites

Generic name	Trade name	Manufacturer	Dose	Frequency	Route	Source
<i>Anti-Fungal Drugs</i>						
Clotrimazole	Canesten cream	Bayer	apply to skin	bid/tid	topical	JHPG
Enilconazole	Imaverol	Janssen	dilute & use as directed		topical	JHPG
mixture will keep for 6 weeks, use a house plant sprayer to apply			dilute 1:50 with water	spray daily	topical	St Tigs
			mix 1:50 with water	spray well and allow to 'drip dry'. Spray every 3 days until hog has had 4 sprays. Keep warm during treatment. Mixture will keep for 6 weeks.	topical	Vale
Fluconazole	Diflucan oral	Pfizer	10mg/kg	daily for 1-4days	oral	
Itraconazole	Sporanox	Janssen	20mg/kg	twice daily	oral	St Tigs
Itraconazole 10mg/ml	Itrafungol		1.5ml/kg	daily for 7 days	oral	JHPG
				repeat after 7 days		
Ketoconazole	various	various	10mg/kg	Daily	oral	JHPG
Natamycin	Mycophyt		dilute and use as directed		topical	JHPG
<i>Anaesthetic/Analgesic drugs</i>						
Atipamezole - reverses Medetomidine	Antisedan	Pfizer	300-500 mcg/kg		im only	St Tigs
			reverse Medetomidine with equal volume Atipamezole		im sc	JHPG, Pro Igel
			1mg/kg to reverse Xylazine		im sc	JHPG
Buprenorphine	Temgesic Vetergesic	Schering-Plough	0.05-0.1 mg/kg	8-12 hours	im	JHPG
			0.03-0.05 mg/kg	every 6-12 hours	sc: im	
			can be used when Corticosteroids are also given			Vale
Butorphanol	Torbagesic	Fort Dodge	0.4mg/kg		im sc	JHPG
			0.5mg/kg	4 times daily for up to 2 days	sc im	Vale
Carprofen	Rimadyl	Pfizer	5mg/kg	sid for up to 5 days	sc	St Tigs
			4mg/kg	sid 3days	sc	IR/AR
			4mg/kg	24-36hrly	sc	JHPG
Diazepam	Valium	Roche	1-3mg/kg	every 6-8 hrs	oral:im iv	JHPG
Fentanyl/Fluanisone	Hypnorm	Crown, Janssen	1ml/kg		im sc	JHPG
Halothane (in oxygen)	Halothane	M&B	5% - 2.4%	induce at 5% maintain at 2-4%		St Tigs
Isoflurane (in oxygen)	Isoflurane	Abbotts Labs	5% - 1-3%	induce at 5% maintain at 1-3%		St Tigs
Isoflurane (anaesthetic of choice)	various	various	3-5% induction	anaesthetic of choice		JHPG
			0.5-3% maintenance			
Ketamine hydrochloride	various		80mg/kg		im	IR/AR
			5mg/kg - with Medetomidine		im	St Tigs
Ketamine - better in combination see below			5-30mg/kg sedation/anaesthesia		im	JHPG
Lignocaine 2%	various	various	0.05-0.2ml		sc	JHPG
Medetomidine - *see combinations below	Domitor	Pfizer	100mcg/kg		im	St Tigs
			0.1-0.2ml/hog		im	Pro Igel
			0.1mg/kg		im	JHPG sedation
Meloxicam	Melacam	Boehringer Ingelheim	0.1mg/kg	sid	oral sc	JHPG
			0.5mg/kg	for up to 3 days	oral sc	Vale

Generic name	Trade name	Manufacturer	Dose	Frequency	Route	Source
Midazolam - * see combinations below	Hynovel		1-2mg/kg		im	JHPG sedation
Propofol	Rapinovet & Others	Schering-Plough & other companies	10mg/kg		iv	JHPG
Xylazine* - * see combinations below	Rompun	Bayer	1-2.5mg/kg		im	JHPG sedation
<i>*Sedative and anaesthetic combinations:</i>						
Fentanyl/Fluanisone	Hypnorm	Crown, Janssen	1ml/kg		im sc	JHPG
		Tranquilizer/neuroleptanalgesic can partially reverse with Buprenorphine or Butorphanol				
Medetomidine}			0.1mg/kg	Anaesthesia-reverse Medetomidine with Atipamezole 300-500meg	im	
Ketamine}			5-15mg/kg		im	
Midazolam}			1-2mg/kg	sedation	im	
Ketamine}			5-15mg/kg		im	
Xylazine}			1-2.5mg/kg	Anaesthesia -reverse Xylazine with Alpamezole 1mg/kg	im	
Ketamine}			5-15mg/kg		im	
<i>Various oral and injectable drugs not included in previous categories</i>						
Bromhexidine hydrochloride	Bisolvon	Boehringer	1-3 mg/kg 3 mg/kg	tid daily for 7-10 days	im sc im	St Tigs Vale
			1 pinch	14 days as nec on food	oral	JHPG
Clenbuterol hydrochloride	Bisolvon powder	Boehringer	0.6mcg/kg	sid	im	St Tigs
Clenbuterol	Ventipulmin	Boehringer	0.5ml/kg	bid up to 3 days	sc	Pro Igel
Dexamethasone	Planipart	Boehringer	0.1-0.04mg/kg	sid - reducing doses	im sc	St Tigs
Dexamethasone (2mg/ml)	Dexadreson	Intervet	1mg/kg		sc	Vale
			5mg/kg		sc	Vale
			5mg/kg 1st dose then 2.5mg/kg then 2mg/kg		bid sc	Vale
			0.05-0.15mg/kg	sid x 5 days	sc	JHPG
			2mg/kg	sid (max 5 days)	im	St Tigs
Flumixin meglumine	Finadyne injection	Schering-Plough	5-10mg/kg	twice daily	oral sc im iv	Vale
Frusemide	Dimazon	Hoechst	2mg/kg	bid/sid	sc im	
	Lasix 5%		2.5-5mg/kg	tid	im sc	JHPG
			0.1-0.2ml/kg	8 hrly max, not prolonged use	sc im	St Tigs
Hyoscine-N-butyl-bromide/diptyrone	Buscopan	Protexin veterinary	1ml	tid	oral	JHPG
Kaolin/Probiotic	Prokolin Syringe	Upjohn	0.1ml/0.05ml	one with 1st Levamisole	sc	JHPG
Methylprednisolone	Depo-Medrone V	Intervet	2mg/kg	every 3 weeks	im	St Tigs
Nandrolone laurate	Laurabolin	Intervet	12mg/kg	half hour before food	im	St Tigs
Propentofylline	Vivitonin					
<i>Vitamins</i>						
B Vitamins	Amnit 4BC	Animalcare	1ml/kg	sid x5	sc	JHPG
Multivitamins	Arkvits	Vetark	1 pinch/kg	sid	oral	JHPG

Generic name	Trade name	Manufacturer	Dose	Frequency	Route	Source
<i>Oral rehydration packs</i>						
Electrolytes & Glucose	various	various	up to 25ml/kg	tid	oral	JHPG
Sterile Intravenous fluid packs	Aquapharm	Animalcare	No 1 No 3 No 11 No 18	saline- correct dehydration & flush wounds correct dehydration if energy depleted Dehydration associated with diarrhoea maintenance fluid & after prolonged dehydration		JHPG JHPG JHPG JHPG
Amino acids glucose etc.	Duphalyte	Fort Dodge	as 10% of fluid 12ml/kg	replacement up to 10ml/kg daily	oral iv sc ip sc	JHPG St Tigs
Probiotic powder	Protexin	Probiotics Int Ltd	1 pinch	sid	oral	JHPG
Lactobacillus, acidophilus, bifidus Lipase, amylase, protease, cellulase, electrolytes, vitamins	Acidobifidus powder	Higher Nature	1 pinch	sid	oral	JHPG
	Avipro	Vetark	1 pinch	sid	oral	St Tigs
<i>Topical preparations not included in previous categories</i>						
<i>Eye Preparations</i>						
Betamethasone + neomycin	Betsolan eye/ear drops	Pitman-Moore	1 drop	E 6-8 hrs - topical (not if corneal ulceration suspected)		
Chloramphenicol eye drops 0.5%	various	various	1 drop	E 6-8 hrs	topical	
Chloramphenicol eye ointment 1%	various	various	1 application	tid	topical	
Fusidic acid	Fucithalmic	Leo	1 drop	E 12-24 hrs	topical	
Hypromellose 0.3%	Hypromellose	various	1 drop	as directed	topical	
Ofloxacin	Exocin Ophthalmic solution	Bayer	2 drops	4 times daily	topical	St Tigs
Polymyxin B + neomycin + dexamethasone	Maxitrol eye drops	A Icon	1 drop	E 6-8 hrs topical (not if corneal ulceration suspected)		
<i>Ear Drops</i>						
Framycetin, nystatin, prednisolone dianolamine fusidate	Canaural ear drops	Leo	1-2 drops	bid	topical	
Polymyxin B, miconazole, prednisolone	Surolian	Janssen	1-2 drops	bid/tid	topical	
Phenoxyethanol & chlorbutol	Otodex vet ear drops	Petlife International	3-4 drops	sid	topical	

Generic name	Trade name	Manufacturer	Dose	Frequency	Route	Source
<i>Skin Preparations</i>						
Fusidic acid + betamethasone	Fuciderm Gel	Leo	apply to skin	bid	topical	
Propylene glycol, malic acid, benzoic acid salicylic	Dermisol cream	Pfizer	apply to skin	bid	topical	
Propylene glycol, malic acid, benzoic acid salicylic	Dermisol solution	Pfizer	liquid cleanser		topical	
Hibitane chlorhexidine gluconate 4%	Hibiscrub	Pitman-moore	dilute 1:4 for cleaning wounds		topical	
	Intrasite gel	Smith & Nephew	wound dressing		topical	
<i>Antacid</i>						
Ranitidine	Zantac		3.5mg/kg twice daily for at least 14 days (25mg/ml injectable=0.15ml/kg) 15mg syrup = 0.25ml/kg		sc	Vale
					oral	Vale

Some drugs are likely to be added or removed from the formulary or doses amended - however, an up to date list of some of the drugs listed here can be found on the Vale Wildlife Hospital website, www.valewildlife.org.uk

KEY:

Dose rates: sid = once daily; bid = twice daily; tid = 3 times daily.

Routes: po = oral; sc = subcutaneous; im = intramuscular; iv = intravenous; io = intraosseous; ip = intraperitoneal

Sources of information: JHPG = Hugh Forshaw, Jersey Hedgehog Preservation Group; IR/AR - Ian Robinson & Andrew Routh, RSPCA Wildlife Hospitals; St Tigs = Les Stocker, Wildlife Hospital Trust; Pro Igel = Igel in der Tierazpraxis (The Hedgehog in the Vet's Practice - hedgehog treatment manual); JD = Jane Durrant, Welsh Hedgehog Hospital; KB = Kay Bullen, Hedgehog Helpline, BHPS = British Hedgehog Preservation Society, Vale = Vale Wildlife Hospital (**regularly update dose suggestions on www.valewildlife.org**).

NOTES:

It is suggested that when injecting **Levamisole** or **Ivermectin** the injection site used is away from the head and that injecting into the abdominal cavity is avoided. **Ivermectin** can be diluted 1:9 with sterile propylene glycol for injection (this solution is stable for 30 days) or it can be mixed 1:9 with water for topical use (this solution is not stable).

The above doses are taken from the most recent sources, however it should be borne in mind that dosages may change and drugs go out of manufacture. The above is intended as a guide only.

If you have used any drugs on hedgehogs with repeated success that are not included in the above please let the British Hedgehog Preservation Society (BHPS) know the details so consideration can be given to including them in any revised editions. The BHPS will keep notes of any amendments made to the above formulary. If you have any doubts on whether a drug is still being used or whether the dose quoted still applies (or is correct) for hedgehogs or any other queries the BHPS can be contacted on 01584 890801.

You can request a free vet pack for your surgery including posters for your waiting room - just contact us (see back page).

Natural remedies:

Aromatherapy oils, such as Lavender, Rosemary, Chamomile, can be used on bedding to calm stressed hedgehogs.

Almond oil containing a few drops of Tea Tree oil painted to areas of ringworm may help to kill spores and bacteria and should help to soften the scabs caused by ringworm or mange.

Almond oil containing a few drops of Lavender Oil – as a massage for mobility/stiffness.

Rescue Remedy: Bach Flower Remedies: first aid for stress

Pro Biotic Powder: Protexin in sachets from the vet or Acidobifidus powder (Lactobacillus Acidophilus and Bidfidus bacteria) from health food shops to restore healthy gut flora after antibiotic or when digestive upsets occur.

Evening Primrose Oil: few drops on food to improve condition of skin/fur/spines

Wheatgerm Oil: to improve general condition

Olbas Oil or Eucalyptus oil: few drops on bedding to ease blocked noses (to encourage hedgehog to eat)

Abidec or multi-vitamins on food to improve appetite and condition.

Charcoal (medicinal) for trapped wind, toxins in gut and diarrhoea.

APPENDIX 3 – USEFUL ADDRESSES and FURTHER READING

Useful addresses:

BHPS – see back cover.

Vale Wildlife Hospital - www.valewildlife.org.uk update their rehab section and drug suggestions frequently.

Pro Igel e.V., Lilienweg 22, D-24536 Neumünster, Germany
Web site www.pro-igel.de or email Pro_igel@t-online.de

Dora Lambert, Arbeitskreis Igelschutz Berlin e.V. Basaltweg 25,
D-12349 Berlin, Germany

Kay Bullen, c/o British Hedgehog Preservation Society, Hedgehog House, Dhustone, Ludlow, Shropshire SY8 3PL

Live Foods Direct, Houghton Road, North Anston Trading Estate,
Sheffield, S25 4JJ. Telephone 01909 518 888;
Fax 01909 568666; email sales@livefoodsdirect.co.uk

Pets Choice Ltd (Spike's food), Brentwood House, Lower Philips Road, Whitebirk Industrial Estate, Blackburn, BB1 5UD.
Telephone 01254 54545, email info@petschoice.co.uk

Further Reading:

The British Hedgehog Preservation Society has published a book on hedgehog care called **Hedgehog Rehabilitation*** by Kay Bullen. Only available through the BHPS.

The British Hedgehog Preservation Society has booklets on **“Rearing Hoglets”*** **“Know Your Hedgehog - The Basic Facts and Much More”*** and **“Guidance for Releasing Rehabilitated Hedgehogs”***

Morris P - **Hedgehogs*** Whittet Books, Reprinted with additional material, 2018

Breese D - **Everything you want to know about hedgehogs** Midsummer Books 1998

Stocker L - **The Complete Hedgehog**, Kingdom

Robinson I and Routh A - **Veterinary Care of the Hedgehog*** - In Practice March 1999

Medication for use in the Treatment of Hedgehogs - St Tiggywinkles. The Wildlife Hospital Trust, Aston Road, Haddenham, Aylesbury HP17 8AF

*These can be ordered from the BHPS.

USEFUL ITEMS TO HAVE WHEN CARING FOR HEDGEHOGS

Small plastic bowl - For use as a bath.

Tweezers - Fine pointed if possible, for removal of maggots and fly eggs.

Small sharp scissors - For cutting spines.

Cotton buds - Ideal for wounds, applying cream, disinfectant etc.

Kitchen roll.

Cotton wool.

Disposable plastic gloves - Hygiene is vital.

Scales - Weight checking is important.

Hot water bottles - Vital for providing heat to hypothermic hedgehogs.

Clean towels - To use as bedding for hoglets or sick injured hedgehogs.

Newspapers - For lining hutches and pens or as bedding for convalescing adult hedgehogs. Do not use shredded paper.

Syringes or Droppers - For feeding hoglets and administering medications.

Tinned cat, dog or hedgehog food - White meat flavours such as chicken, turkey or rabbit.

Dried hedgehog foods or cat or small dog biscuits - To help keep teeth clean.

Small pack of Lectade - Rehydration fluid essential for sickly hedgehogs in shock.

Multivitamins

Washing up Liquid - 2% solution good for cleaning off oil, paints etc.

Salt - Diluted in warm water, used for cleaning wounds.

Sterilising tablets - To keep hoglets' feeding equipment infection free.

Bach's Rescue remedy - Good for calming down stressed hedgehogs.

Feeding dishes - Shallow, straight sided heavy dishes for adults, jam jar lids for hoglets.

Electric Heat Pads - To provide 24 hour constant heat. The BHPS has tried to ensure that every carer on its contacts list has one of these heat pads.

Olive Oil - for flushing maggots out of ears.

Tick remover - see notes on tick removal on our website or request our 'Notes on tick removal'

A space for your notes

The Aims of the Society are:

To encourage and give advice to the public about the care of hedgehogs, particularly when injured, orphaned, treated cruelly or in any other danger.

To encourage the younger generation to value and respect our natural wildlife and, by supplying information and giving lectures, to foster their interest in hedgehogs.

To fund research into the habits of hedgehogs (which involves no deliberate cruelty) and to ascertain the best method of their survival.

*For further information please send a s.a.e to:-
British Hedgehog Preservation Society,
Hedgehog House, Dhustone,
Ludlow, Shropshire SY8 3PL*

*Email: info@britishhedgehogs.org.uk
Web-site: www.britishhedgehogs.org.uk*

For urgent advice call 01584 890801

