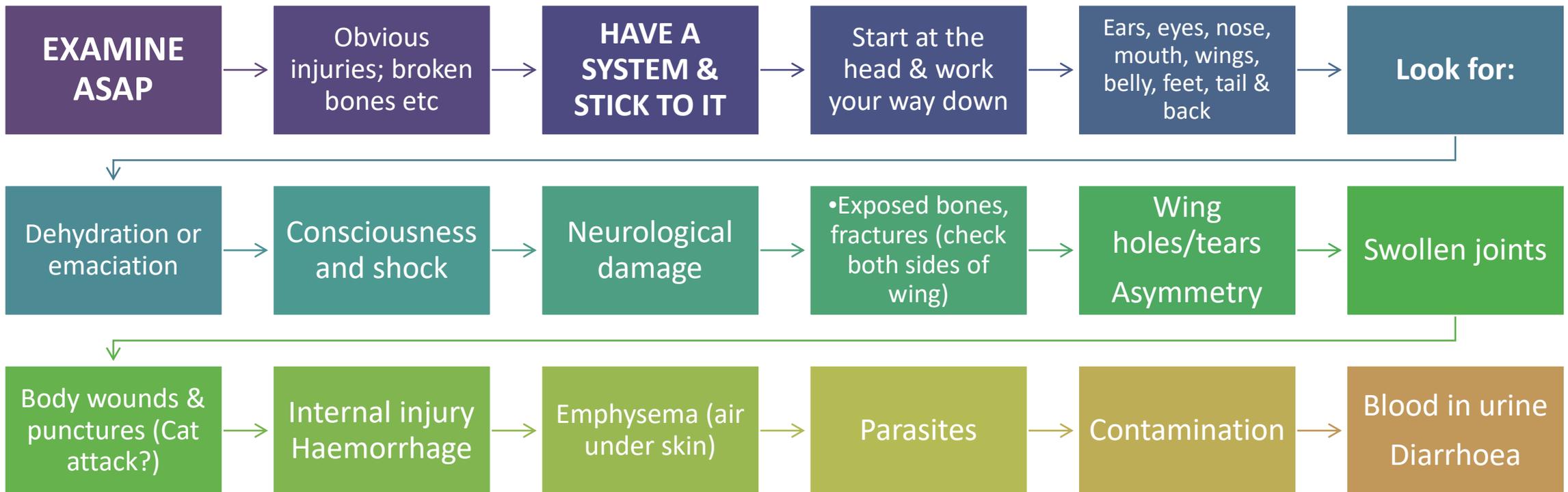




Bat Rehabilitation

Common injuries, treatment and outcomes

Initial Assessment Checks





Ethics

- **For all treatment decisions, consideration should be given to:**
 - The level of damage
 - Number of injuries that are affecting the bat
 - Condition of the bat (grooming, feeding, drinking etc)
 - Distress level
 - Long term prognosis (i.e. can the bat be released or long term captive? Would the latter be ethical for this bat)
- **Euthanasia:**
 - Euthanasia is always an option and should be considered during continuous reassessment of the bat
 - It is not giving up, it is keeping the welfare of the bat paramount. Sometimes it is the kindest thing we can do

Emaciation and dehydration

- **Physical Examination:**
- Fallen in shoulders, hips and abdomen
- Thin skinny knees
- Dry, crispy wings
- **Treatment:**
- Rehydrate immediately with electrolyte based fluids (commercial or homemade)
- Rehydrate often and feed little but often
- Keep warm
- May prefer mealworm innards, blended food or puppy dog milk if available



Consciousness, Shock and Neurological damage

- **Check for responses:**
 - Eyes open
 - Nostrils moving when breathing
 - Responds when lightly blowing on the head
 - Rapid breathing
 - Position of ears (BLE)
- **Neurological symptoms:**
 - Head tilt
 - Walking/flying in circles (not same as doing laps)
 - Seizures or tremors (not revving)
 - Partial or total paralysis
 - Difficulty eating or swallowing
 - Sight or hearing problems (V. difficult to diagnose)



Exposed bones

- Very high infection risk
- Very painful
- Risk of self amputation
- Normally requires euthanasia
- Where the prognosis is good, it will require analgesia and antibiotics



Fractures

- Can be caused by cat attacks or collision with objects, for example
- For major bone fractures euthanasia should be considered (ethics, quality of life)
- Wing tip and distal phalange injuries may heal sufficiently for release
- Will need antibiotics and analgesia, if treatable



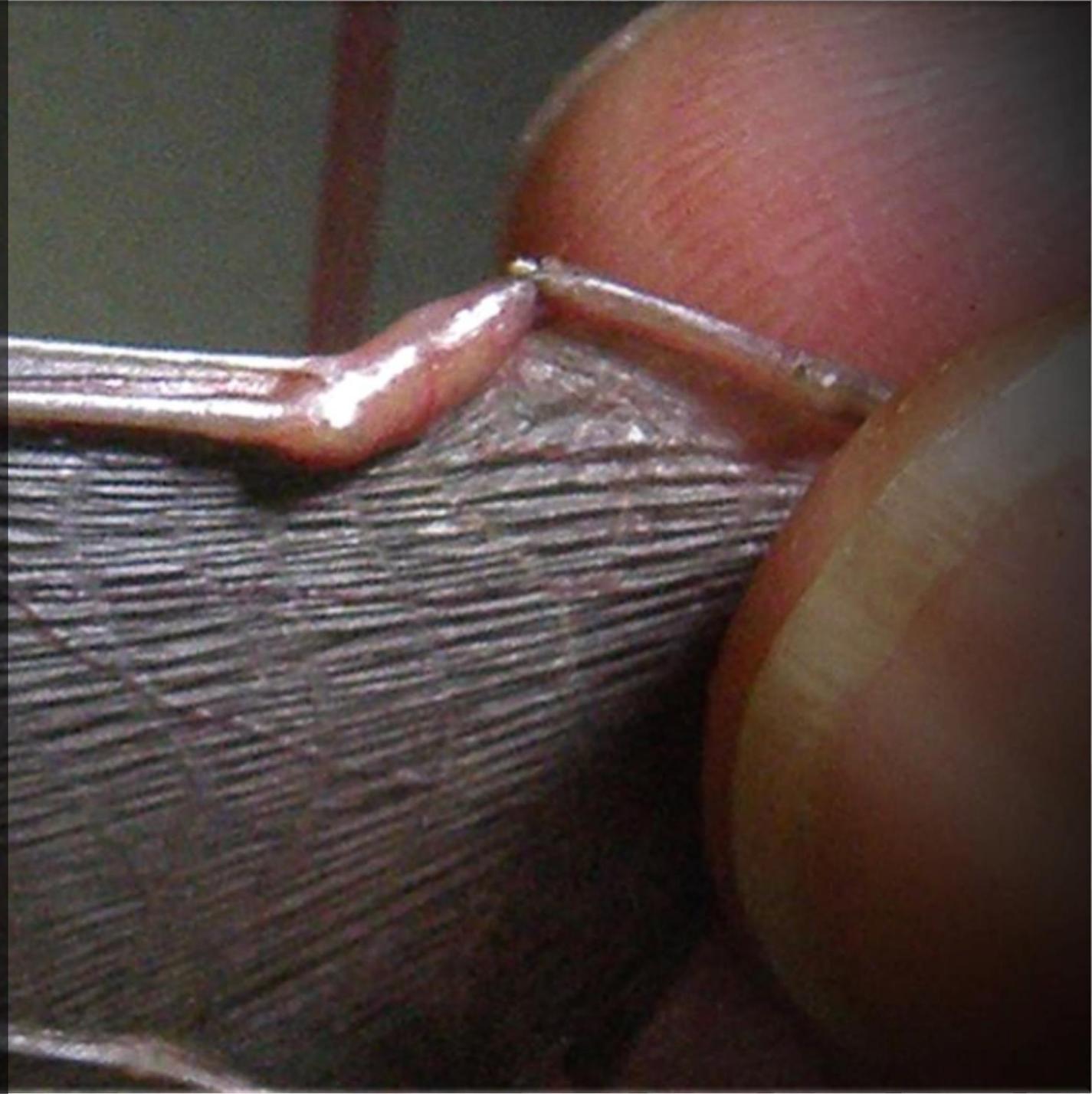


Fractures



Considerations

- Type of fracture – Simple, compound, open etc.
- Will the bat regain full mobility?
- Pinning requires veterinary expertise, long term care, extensive rehabilitation, facilities and financing
- Amputation is not recommended
- Simple fractures may heal with restricted movement
- Bats tend to remove anything attached to the wing
- Finger bones are likely to heal but may require veterinary assistance to remove non-viable tissue, as well as medication



Holes and tears

- A hole injury is defined as a hole where the wing margin remains intact
- A tear is defined as a rip that extends through the edge of the membrane
- Both are normally caused by cat attacks
- Some holes and tears can be old and do not impair flight
- Antibiotics may be needed if the damage is cat-related (septicaemia and related issues)
- Most holes and tears in the membrane heal naturally in care (or even in the wild)





Considerations

- Fractures or dislocations?
- Are any of the finger bones exposed?
- De-gloving of the finger (often fifth finger) prone to infection and poor prognosis
- Size of the holes and/or tears
- Large holes and tears require a long rehabilitation time (ethics)
- Scar tissue of large tears may preclude perfect flight





Torn wings and tail membranes



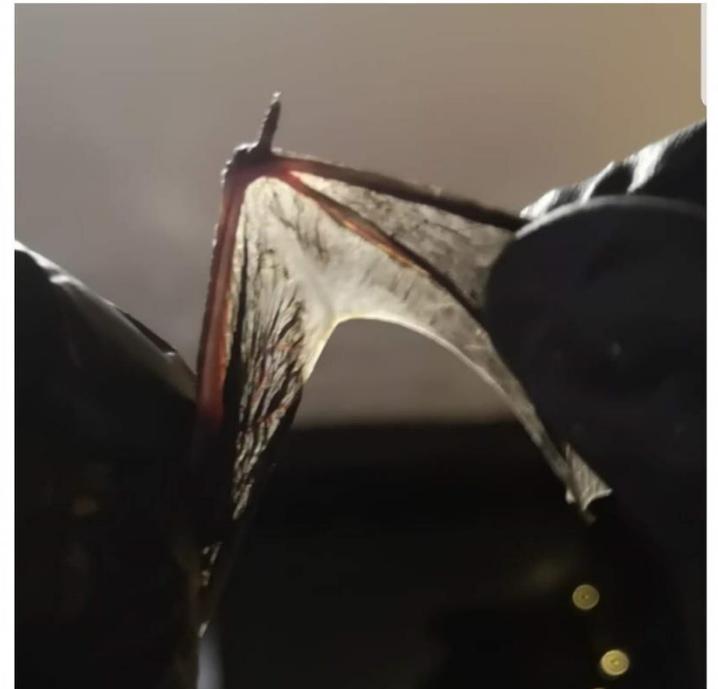
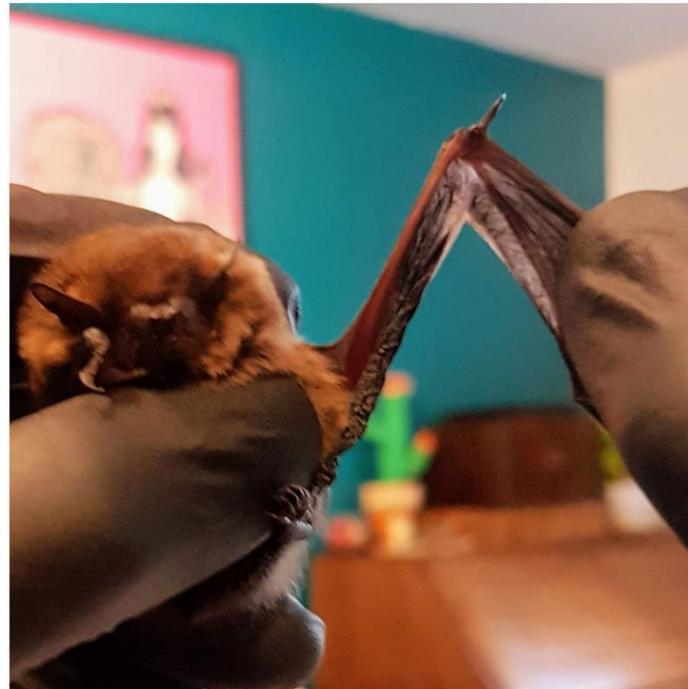
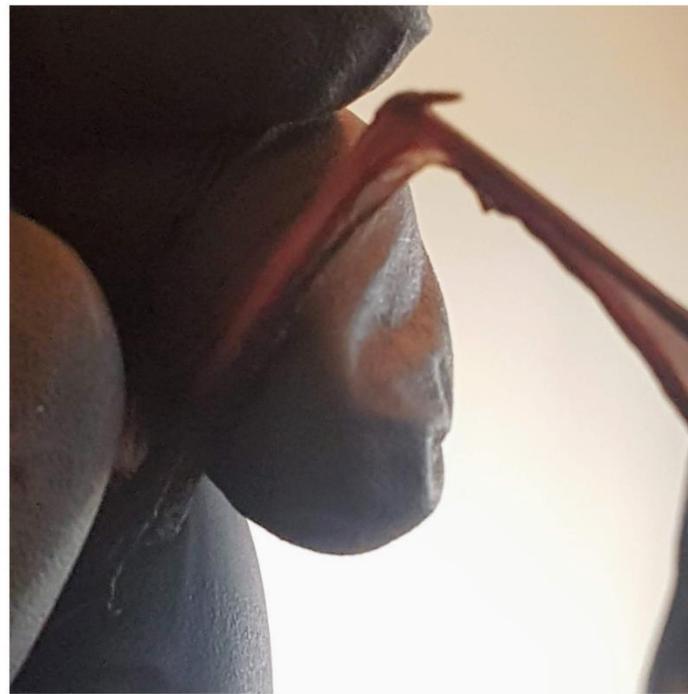
This male Brandt's bat came in with no obvious wounds or broken bones but unable to move one leg and foot. Overnight he started and, over a few hours, he proceeded to chew off all of his right foot, most of his tail and then he started on the other foot.

Euthanasia was the only option

Wing tear during healing

- Viable skin margins essential
- Scar tissue is formed and effectively “zips” wing back together
- Long duration of rehabilitation (May require license)
- Healing slows down during colder seasons
- Must exercise regularly to maintain muscle condition and to ensure scar tissue does not prevent full wing extension

*Common pipistrelle – Cat attack
Overwintered from September 2019-2020
Wing 50% healed at 6 months*



Wing tear before and after



Holes over exposed bone

- Risk of chewing
- Bone will often die off
- Predominantly requires euthanasia (NBG protocol)
- *Common pipistrelle - cat attack 2018*
- *Wing healed well over a period of a few months.*
- *Sudden haematoma and open fracture.*
- *Euthanised at this stage*
- *Post-mortem revealed cause was a combination of the bone having died off and the scar tissue, which is thicker and tougher than normal wing membrane, led to the bat ripping his own bone apart by simply extending its wing.*

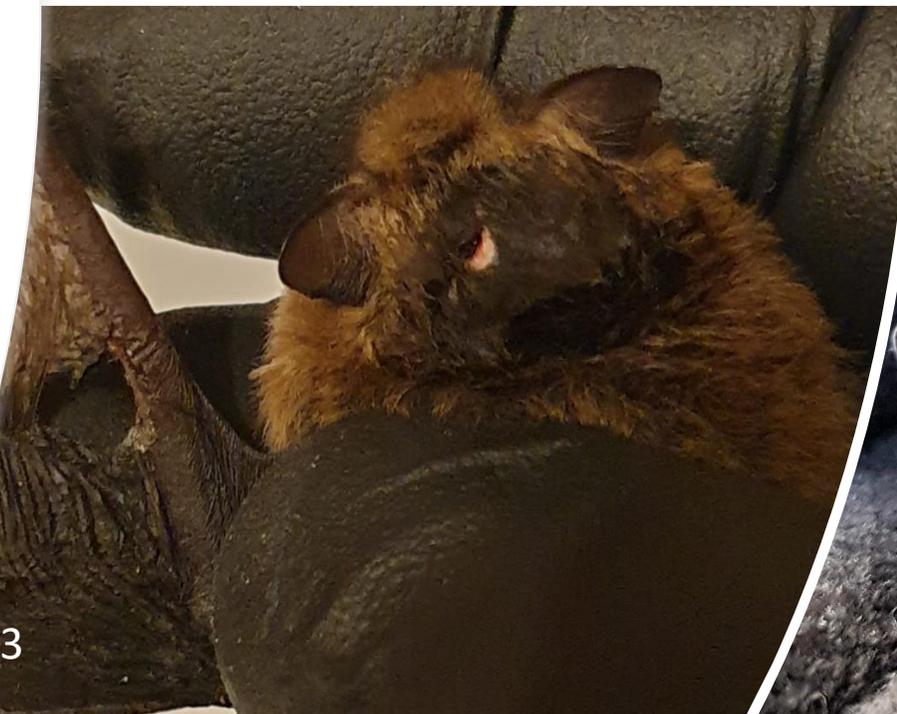


Haemorrhage

- Abnormal collection of blood outside a blood vessel
- Blood vessel wall, artery, vein, or capillary, has been damaged and blood has leaked into tissues
- The haematoma may be tiny, with just a dot of blood, or it can be large and cause significant swelling
- May require antibiotics
- Rest in confined space initially

Skin punctures (& a dislocation)

1. *C. pip* – cat attack. Note the dropped right leg caused by a dislocated hip
2. BLE – cat attack. Note the area of dishevelled fur caused by dried blood around the puncture wound (NB: frozen cadaver)
3. *Pip* – cat attack. A very obvious puncture wound and associated exudate
4. *C. pip* – cat attack. Note the bald patch above the wing from the puncture wound (The Beast [ironic name!] was the only one to be released)





Subcutaneous emphysema

- Predominantly caused by cats
- Require antibiotics and analgesia
- Air or fluid (oedema)?
- Deflation of subcutaneous emphysema with small gauge sterile hypodermic needle required (can be performed by lay person as an emergency first aid measure but should ideally get veterinary surgeon's consent first)
- Restricted movement whilst bat is healing
- Recovery is 50/50, so each case must be taken on its individual merits



Considerations

- Potential invisible injuries caused by cats
- Run finger/wet cotton bud over fur, looking for matted blood (red will appear on the cotton bud if blood is present)
- Emphysema may reoccur again and require further intervention
- Puncture wounds to the body are often the portent of doom; including such complications as severe internal injury and septicaemia. If a bat is not improving or appears in terminal decline:

Euthanasia should always be an option and can be considered after continuous reassessment of the bat

Remember:

One bat will not save a species

It is not giving up, it is keeping the welfare of the bat paramount

Ectoparasites



Mites, Fleas, Flies, Bat Bugs, Ticks, Maggot/Flystrike



All bats carry some parasites and should not cause any harm. If the bat is covered in ectoparasites then something is wrong as they should have been groomed off



Prolonged parasitic load will debilitate the bat



Physically remove excessive parasites with damp paint brush, Q-tip or masking tape (wrapped around your finger or Q-tip with sticky bit on the outside)



Ticks can be removed with Frontline (see BCT guidelines)
Do not try to pull ticks off as leaving mouthparts behind can cause an abscess



Change and wash cloths in cages daily (parasites are drawn to a warmth source so a heat mat will aid removal)



Maggots suggest a severely debilitated bat and it is likely to require euthanasia



Trombiculidae (Chigger mite larvae)



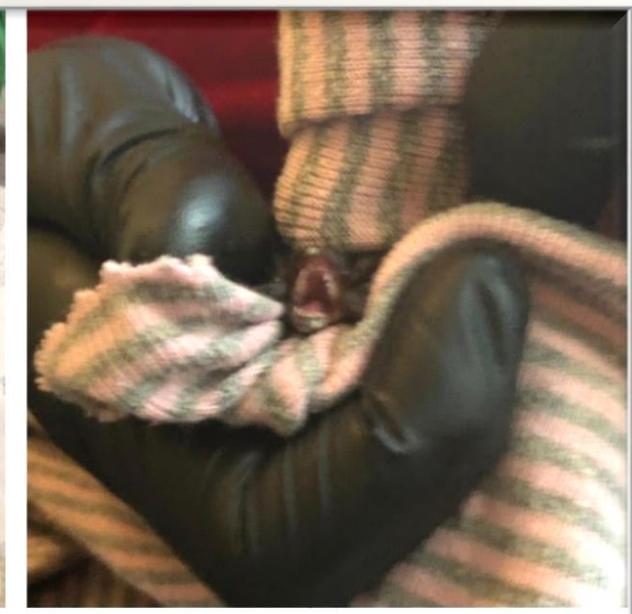
Spinturnix myoti

Parasites



Contamination

- Fly paper, oil, hot tar/bitumen on flat roofs, unknown contaminants
- Rehydration and first aid paramount
- Assess damage, broken bones, severe emaciation etc. Can the bat handle treatment?
- Treatment:
 - Water-soluble contamination can be washed with water
 - Oil-based contamination: use light vegetable oil
 - Bathe bat afterwards in mild detergent and keep warm
 - Some bats will tolerate a hairdryer!



Rehabilitation Plan

A rehabilitation plan should be made when the bat comes into care and be reassessed:

Short term:

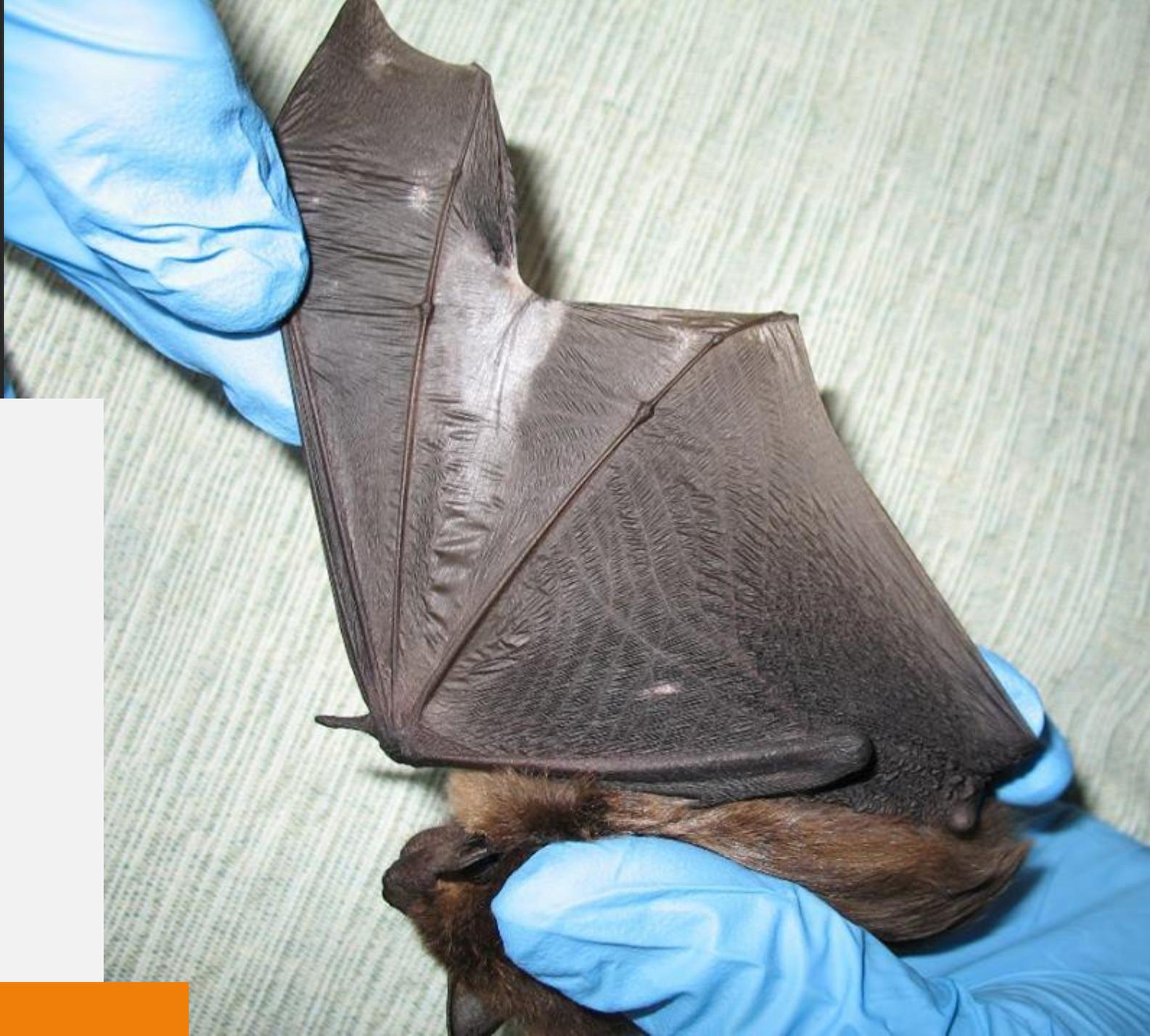
Dehydrated
Underweight

Medium Term:

Small injuries
Underweight
Minor wing issues
Cat attacks

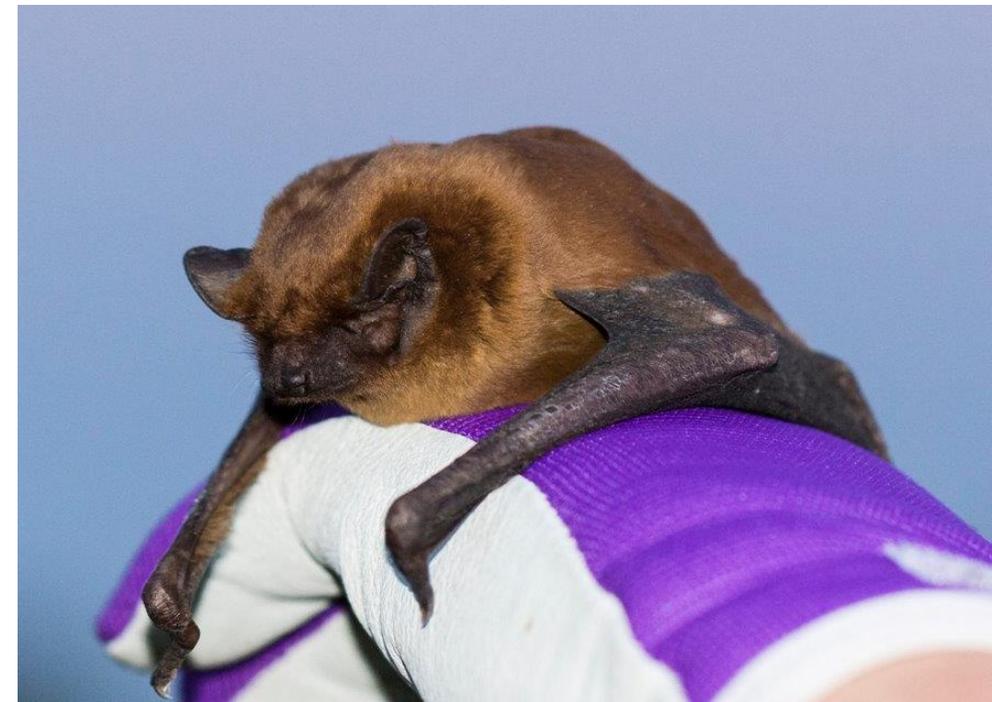
Long term:

Severe wing injuries
Deep tissue/unknown injuries
Over-winter
Flight cage



Assessment for release

- Flight practice (ideally in a flight cage)
- Correct weight
- Must be confident that the bat will have a good quality of life post release
- No diseases/parasites
- Take back to same area it was found
- Good weather conditions (even in winter)
 - Temperature
 - Dry
 - No/low winds



Pups

- Pups wander when left unattended, most pups are just lost!
- Assess for injuries, deformities and excess parasite load
- Locate roost and attempt to reunite the pup with mum (experienced carers necessary/licensed bat worker may be required)
- If roost cannot be found, attempt to reunite at dusk at place of finding
- Never leave the pup unattended, without warmth source or in a place it can wander off out of reach



Pups

- 3 to 5 day window to reunite with mum.
- Should be fed 4-6 times a day between attempts, young ones more often (see guidelines)
- It should be attempted to reunite all juveniles, from very young pups to bats that are just starting to fly, as they are still unweaned
- **Ethics**
If we cannot reunite the pup and mum, hand-rearing for eventual release, or euthanasia should be considered
- Hand-rearing is labour and resource intensive, low success rate and insufficient information on long-term survival rates
- Access to an outdoor flight cage is essential for the pups to learn the many and varied skills they need to survive in the wild
- We can never do as good a job as mum





Credit: Kit Wood



Reunite at place of finding

- Mum will forage first before attempting to pick up the pup
- Be patient, it may take several hours
- Assess location, flight lines, potential roost entrance etc.
- Use ladders or tripod as make-shift 'flight-deck' and supply warmth source
- Make sure pup is fed but not too much (will go to sleep), warm and safe
- The colony or single female should swarm around the pup, occasionally land and pup will call
- If not picked up, but interest from other bat(s) and roost access known, consider "posting" bat back

No interest from mums



- Wrong species or wrong colony?
 - Are there more roosts nearby?
 - Can you hear different species on the detector?
 - Pup may still be calling but mum not showing much interest (possibly separated too long)
 - Other mums virtually never “adopt” a pup that is not theirs – pup’s mum may no longer be present
- Pup is not calling?
 - Possibly wrong species
 - Too cold
 - Asleep (fed too much?)
 - Pup is ill
- Unable to reunite; consider feasibility of hand-rearing and long term plan.



Thank you



NOTTINGHAMSHIRE
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