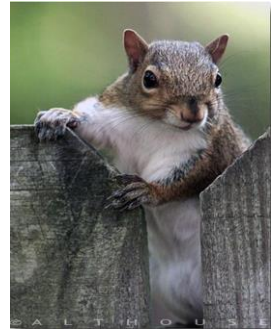


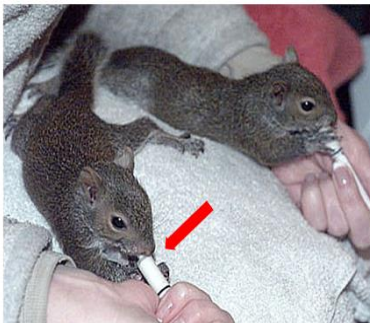
“Anything & Everything Squirrel” by Linda Bergman-Althouse, bergmanx@gmail.com MS EdPsy, EDS, DDI, NVTI, State Certified Wildlife Rehabilitator, Wildlife Rehabilitators of North Carolina, Inc. Board Member, Outer Banks Wildlife Shelter, Newport, NC

Knowing the Squirrel - The squirrel is a misunderstood mammal. They are rodents and people's first impression is that they are vermin. We, as wildlife rehabilitators, know that is not the case. However, the squirrel is still a wild and capable animal that can do you harm if precautions are not taken when treating them. Safety to the rehabilitator is a primary concern along with minimizing stress to the squirrel.



Baby Squirrel Calls: “GIVE MOM A CHANCE” - Try to reunite baby or babies with their mom. If you think the mother squirrel may still be in the area and you have a good idea where their nest is, give mother the opportunity to retrieve her babies. Supervise reunion attempt carefully but from a distance. Make sure babies are safe from natural predators such as cats, dogs, hawks, crows, and snakes but remain out of mom's sight, so she feels safe coming for the babies. If the babies are found just before dark, DO NOT place them out for mom. She won't be moving after dark. Put them out in place as soon as the sun is up in the morning. If she is in the area she will start looking for them then. If she has not come for them within a 2-hour time frame, she probably won't come for them.

If reuniting doesn't work out: Place baby squirrel container or box on heating pad set on lowest temperature. Make sure baby is warm and awake before providing fluids or formula. Test for dehydration, lightly pinch the skin over the shoulders. If it stays tented for a couple of seconds then the squirrel is dehydrated and fluids must be replenished. It's always best to assume that any orphan baby is dehydrated to some degree. Hold the baby in an upright position for feeding and rehydrating, **never on its back**. The formula I use is 32/40 Fox Valley for Pinkies up to 4 weeks, then 20/50 Fox Valley for 4 weeks and older. This Formula is a 2 parts water for one part powder combo. The best way to administer the fluid is with a small syringe: preferably a 1cc and no larger than a 3cc syringe. **Note: With pinkies and very young always check their milk band.**



Miracle Nipple
Excellent Choice

EQUIPMENT NEEDED (Plus heat source – lowest setting, best to place bin half on and half off)



Aging Infant Squirrels



Formula Feeding Schedule:

Up to 2 weeks: every **2 hours** from dawn to dusk - .5 cc
 1 to 2 weeks: every **2 hours** - .75 to 1 cc
 2 to 3 weeks: approx. every **3 hrs** – usually # of cc's in weeks of age
 3 to 4 weeks: every **3 hrs** - 3 or 4 cc's
 4 to 7 weeks : every **2.5-3 hours**
 7 to 9 weeks: approx. every **3 hours** with introduction to solid foods
 9 - 10 weeks : all they want - **3 times a day**, reducing gradually to none
 10 - 12 weeks: should start rejecting formula

Stimulate: Always stimulate baby squirrels after each feeding. Some may require stimulation before feeding. If a squirrel stops eating in the middle of feeding, it may need to be stimulated before continuing to feed. Use a warm, damp cotton ball, tissue or q-tip and gently pat the genitals until urine or stool is produced. You can use a slight downward stroke above their genitals to help them produce urine. You can gently press directly around the anus to help them produce stool. Be sure they are urinating and defecating at least every other feeding. Initially they may not produce much urine if they are dehydrated. They may not produce much stool if they were not fed for a while. Don't be alarmed if they do not produce stool the first day if they were separated from their mother for a while. Generally babies will urinate and defecate on their own soon after their eyes open. If baby does not, continue to stimulate.

Infant Squirrel Ailments

Fleas: A bath in warm water with baby shampoo usually is enough to kill fleas on baby squirrels. Keep the baby's head above the water and gently trickle the shampoo bath water on the face making sure you cover all areas. It is not recommended using flea dips, etc. Fleas in quantity can make a baby squirrel anemic, hurting the chances of survival. (Adams)

Aspiration: Aspiration happens when the squirrel drinks too fast and fluid goes up into its nose, and sometimes into the lungs. If a baby aspirates the liquid, you'll see it bubble out of his nose. To prevent this from causing Pneumonia, immediately tip baby forward so the head is down. Hold securely and allow the fluid to drain out of the nose. No need to pat the back, as there is nothing to dislodge. Let gravity remove the fluids. When baby is calm again and nose is clear, resume feeding. If you don't get the formula out and it gets in his lungs, pneumonia will result. If that happens, you will eventually hear a clicking sound when the baby breathes. That can be fatal. Stop feeding regular formula and go to Pedialyte® for at least 12 hours and put the baby on an antibiotic for 7 days. Hopefully he/she will pull through. Try to be careful when feeding; if baby is snorting formula through the nose, you are feeding too fast.

Over-Feeding: It takes about 5 minutes for the brain of a baby squirrel to register the food in the stomach. During this time he will act like he's starved even though you have fed the correct amount. Most people overfeed because of this which can cause bloat (painful) and also lead to diarrhea problems (deadly). You can usually tell by the color of the stool. It will be runny and light yellow or light orange. If you keep overfeeding, you will kill the baby. Reduce to half of what you were feeding. It usually takes 24 hours for the diarrhea stop. After the diarrhea stops, increase 1/10th of 1 cc as the feeding amount. Continue for 24 hours.

Hypothermia: The body temperature has dropped due to exposure to cold weather. Internal organs start to shut down if low body temperature is prolonged. The baby must be warmed slowly back to normal temperatures by placing container on heating pad set on lowest temperature. **Do not attempt to feed a cold baby.**



Sucking/suckling: Sometimes there will be a baby that wants to suckle on their brother or sister or themselves. When baby squirrels are with their mother, they can nurse all day. When they are fed with a syringe, there is not as much time to quell the urge to suckle. If you encounter this problem, try allowing the baby to suckle on the syringe even though you are done feeding. Eventually the baby will tire and go to sleep. Spray penis with aversive deterrent (i.e. bitter apple). If he is suckling himself, treat penis with petroleum jelly or Neosporin. You may have to remove the "suckling" squirrel to another area. Extreme cases of suckling may result in scabbing and blockage of the urethra. If the scab blocks the flow of urine, it must be removed. This can be accomplished by soaking the scab for 15-20 minutes with a wet cotton ball until the scab turns white and slides off easily.

Dehydration: Very common when animals first arrive. To test for dehydration, lightly pinch the skin over the shoulders. If it stays tented for a couple of seconds then the animal is dehydrated and fluids must be replenished. It is always best to assume that any orphan baby is dehydrated to some degree. Pedialyte is a very good hydrating solution to use. Find it in pharmacies or grocery stores in the baby aisle. Don't use a solution with more than 2.5% dextrose for initial hydration. (Lactated ringers solution also good). Before feeding anything else, feed it a few meals of Pedialyte. Don't be in a hurry to feed other foods. Squirrels that are dehydrated can't digest foods well and may become very sick or die if food is given too soon.

Emaciation: Also, Very common with squirrels that have been orphaned for a full day or two. The squirrel will be very thin and weak. Hydrate with Pedialyte every fifteen minutes for the first hour. Transition slowly to ½ Esbilac Formula and ½ Pedialyte mix. (Some use ensure and Pedialyte ½ mix), which is easy for baby to digest. Then gradually introduce full formula. Don't rush the process. **DO NOT OVERFEED** an emaciated squirrel, even if they want more. They will be in a feeding frenzy to replace all they have missed, but you must use restraint and cut them off. It will be a death sentence if you don't.

Hypoglycemic Seizure: If a baby is arching his head back and acting very weak, he may be hypoglycemic due to lack of glucose in his system. Try a small amount honey, karo syrup, or all-fruit jelly on his tongue to help pull him out of a hypoglycemic seizure.

Ant Bites: If your squirrel has ant bites, wash off with warm water and put salve on. You can give Vitamin C (25 mg.—4 times a day) before each feeding for several days. If you suspect or see fly eggs or maggots, remove those immediately before they hatch into maggots. Use a flea comb, dry tooth-brush or fingernails to remove eggs. Bathing these areas in warm water may inactivate any missed eggs. Soaking clumps of fly eggs in baby oil for a few seconds helps with flea-comb removal. Remove maggots with tweezers (if only a few). If there are larger areas, use Adam's Flea Mist on cotton ball and press onto area to kill maggots. Wash wound with warm water on cotton ball and apply antibiotic to area 2 or 3 times a day until wound has healed.

Squirrel Trauma: Injury and /or Attack

Injury (falls, hit by car, shot): If trauma has occurred within 24 hours an anti-inflammatory nonsteroidal (i.e. Metacam) is recommended and given to reduce spinal and brain swelling. Following a severe head injury, conscious squirrels may have to be hand fed, because their limbs don't function well and muscle coordination is poor. If a squirrel is clipped by a car and thrown, he will have road rash. If it is severe, use lidocaine 10 mg/ml (to relieve itching, burning & pain) before cleaning wound. Flush wound with sterile saline then iodine to remove dirt and road debris. Administer antibiotics. Use triple antibiotic ointment with pain reliever on wound. If eyes are also injured, you can use Terramycin ointment (for eye injuries, 2 to 4 times daily, as needed). Apply with a q-tip gently and directly to eye. Due to the stress of captive care some lose their appetite temporarily, so you need to carefully feed them a liquid supplement with a syringe. They can regain their strength through this procedure.

If the squirrel has been caught by a cat, dog or hawk. It must receive antibiotic treatment It must receive antibiotic treatment (i.e. SMZ (Sulfamethoxazole), Clavamox or Baytril) within a few hours or the bacteria on the cats teeth may cause it to develop fatal septicemia. within a few hours. Attack wounds can develop abscesses that will require surgical opening and draining, along with antibiotic therapy. These wounds have to be kept open and flushed to facilitate healing. You may find jaws that need wiring, limbs that are broken, and comatose patients. Don't give up on them.

Also, look for maggots in old wounds. Check Everywhere! - the ears, eyes, nose, mouth, rectum, or any injuries that the maggots could be inside. Remove with tweezers. **Properly assess for injuries, Treat for shock (Dark, Warm & Quiet), AND DEFINITELY keep squirrel patient away from cats, dogs, ferrets, parrots, pet skunks, raccoons, fox, coyote, bear cubs, pelicans, mountain lions - so on.**



In defense of maggots:

Maggots serve three medicinal purposes: 1) Debride (clean) wounds by dissolving the dead (necrotic), infected tissue 2) Disinfect the wound, by killing bacteria 3) Stimulate wound healing.

Bot Fly (*Cuterebra emasculator*): “Lumpy squirrels” are a common sight during mid and late summer in eastern and Midwestern North America (from Canada to Florida). The Bot Fly, a natural parasite of eastern gray, red squirrels and fox squirrels (flying squirrels very rarely), live under the squirrel’s skin and produce these nasty swellings or “warbles.”



Each warble typically contains only one larva and at its tip is an opening, the 'warble pore', which is cut through a squirrel's hide by the larva so that it can breathe and excrete liquid. The terms 'bots' and 'warbles' give rise to the names 'bot flies' and 'warble flies' for these and closely related species of flies. It is important to realize that bot flies are a natural part of the ecology of squirrels, along with many other parasites that are not so readily apparent, including fleas, mites and internally living species such as tapeworms and roundworms. Parasites are one of many natural factors with which a squirrel must cope. We should generally "let nature take its course" with squirrels infested with bots. After the larvae exit, the skin shrinks and returns to normal. However, if an injured adult squirrel is admitted that also has bots, the best approach would be to extract the larvae. This would remove one source of stress on the squirrel so it can better cope with its other injury. Bots in orphaned infant and juvenile squirrels in the care of a rehabilitator should also be

removed, because the stress of the larvae could hamper the growth of the baby or prove fatal.

Mange (Notoedres douglasi Sarcoptes scabiei): Mange is a term commonly used to describe the obvious signs of a burrowing mite infestation on an animal host. Mites are tiny, 8-legged arthropods, related to ticks and spiders. Mange starts on the ears and around the eyes, usually, and the skin in squirrels' balding spots will be raw and look rough. Mange mites burrow into the skin of animals and feed on subcutaneous tissues. The site of the infestation becomes irritated, itchy and results in scratching by the host animal and ultimately, hair loss. Very little can be done to help them, unless you can catch the squirrel and apply repeated applications of an insecticide (i.e. **Adams Flea & Tick**). Like other natural afflictions, mange has been said to be nature's way of eliminating weak individuals, thinning populations so only the healthiest survive. Most animals can tolerate 'some' mites, but when they become severely infested it causes anemia and the animal may die. So a high protein, high fat diet may be his only salvation unless someone can trap and treat him. **Administer liquid Ivermectin** (lower dose anti-parasitic that facilitates release of GABA-an inhibitory neurotransmitter) to infestees. It can be given on a pecan or walnut and the squirrels don't seem to mind the taste. **Severely infested squirrels** show distinct signs of poor health, and mange has proven fatal to wild animals in numerous instances. Mange appears to be a contributing factor, if not a primary one, in squirrel mortalities in cold weather. Sarcoptic mange mites are



known to transfer from animal hosts to people, so persons handling mangy animals should take reasonable precautions: wear rubber gloves if possible, and always wash promptly after handling a diseased animal. Freezing kills the mites; therefore it is best to freeze carcasses that are collected for examination. Notoedric mites are not transmissible to humans. **They can and do recover frequently when treated.**

Poisoning: Toxicity, such as a hypersensitivity to pesticides (lawn sprays), due to chemicals or intentionally placed rodent poisons cause: 1) Extremities; weakness; upper limbs; hands 2) Generalities; pain; intolerable 3) Hemorrhage 4) Mind; restlessness, nervousness; general 5) Mind; anxiety. **Treatment:** Administer **Vitamin K** (shot initially) and fluids. 2 mg/kg at least once or twice daily orally for at least four days to thirty days (Or homeopathic medicines such as **Arsenicum album**) **Factors influencing treatment success:** 1) There is a short window to be able to successfully treat toxins – effective help must be made available quickly 2) Appropriate medicine and dosage must be administered 3) The animals were still in good enough condition to be able to recover.

Malocclusion: The prominent characteristic of rodents is the presence of upper and lower incisors that grow continuously throughout their lifetime. As a result, a squirrel must gnaw on hard objects such as nuts or wood to keep their teeth worn down. If this is not done, a condition called malocclusion occurs. Squirrels cannot eat or drink properly because teeth (usually incisors) are not properly aligned. The teeth over grow because they do not meet and cannot be ground down through normal wear. The teeth grow so long, they can grow through the cheek or roof of the mouth. Without treatment, the result is death due to starvation, because overgrown incisors prevent the squirrel from chewing, swallowing or closing their mouth properly. Malocclusion can also be caused by a cleft palate or a falling injury when young. Sneezing and sniffing are indications of malocclusion. Squirrels have four large incisor teeth for gnawing, which grow the entire duration of their lives and an additional eight cheek teeth on each of the upper and lower jaws. Squirrels' teeth do not have nerves just like human hair and fingernails, so they do not feel pain when you trim their teeth properly. **Treatment plan:** Incisors should be trimmed and filed biweekly as needed. If squirrel is still unable to grind down teeth on his/her own, incisors could be removed (but not if squirrel will be released).



Trimming Squirrel Teeth: **Ready your tools:** (sharp, straight edge clippers, Dremel tool or emery board, wooden dowel or orange stick, towel wrap, safety glasses (**for you, not the squirrel**), leather gloves & anesthesia such as Sevoflourine if necessary. **Wrap your squirrel** like a burrito and cover his/her eyes. (use material with a tight weave and Velcro closures work very well) **Don**



your safety glasses before you begin to trim teeth. (Pieces of teeth will fly). **Insert wood dowel** into mouth as shown to protect tongue and mouth. (behind the teeth and on top of the tongue with dowel protruding out both sides of mouth) **Upper incisors:** should be 1/8 to 3/16" below gum line. (Infants-white, Adults-Orange) **Lower teeth:** should be 1/2 to 3/4" above gum line. **Trim one tooth at a time** with a quick snapping motion and be careful not to create a vertical fracture when using your clippers. **File teeth:** When you use straight edge clippers and clip cleanly, there should little filing needed. A dremel tool with a mild filing bit can be used, but I prefer an emery board. **Safer** for the squirrel is no

anesthesia and use an emery board. Give squirrel lots of things to chew (sterilized dog bones, cuttle bone, unshelled nuts, pieces of wood, nutritional rodent blocks, pumice stone or deer antlers). Ensure proper nutrition with lots of calcium.

Metabolic Bone Disease (MBD): is a deficiency of calcium in a squirrel's diet, so it's most often caused by improper diet where too many of the wrong nuts (hazelnuts, almonds, Brazil nuts) which are low in calcium, were provided. Vitamin D, which under normal circumstances the body produces on its own (needing sunlight to do so), is vital to the body's ability to absorb calcium. Sun received through windows and window screens is not adequate because these filter the important UV rays necessary for this to take place. Calcium is also needed for all organic functions, including heart, respiration, blood circulation, muscle and eyesight. **So – ignorance, diet and not enough sunlight cause Metabolic Bone Disease. Educate the public – squirrels should not be kept as pets.** Some of the signs of MSD are excessive sleeping, not wanting to move around or jump and climb, activity levels decline, lethargy, sometimes a drop in appetite, sometimes labored breathing, increasing in severity to seizures and or paralysis, then death if not treated. **MBD is painful and deadly.** The bones and muscles become weak and the squirrel is in pain. Swollen joints and improper bone growth (legs splayed in or out) are signs of MBD's progression. In more drastic cases there are seizures and lack of use of the back legs. MBD can be prevented. **Necessary for indoor squirrels:** Nutritional rodent blocks, High-Calcium vegetables (arugula, beet greens, carrots, endive, celery, collard greens, dandelion greens, fennel, mustard spinach, radishes, squash, turnip greens, fresh parsley, radicchio, romaine lettuce, Swiss chard and watercress. **Other veggies:** Asparagus, avocado, bell peppers, broccoli, cabbage, carnations, cauliflower, cherry tomatoes, cucumber, green beans, mushrooms, okra, pumpkin, sugar snap peas, sweet potato, zucchini. **Wild Foods:** pine cones, pine bark, Bradford pear berries, dogwood berries, roses, (make sure area wasn't sprayed, fertilized or treated with chemicals). **Fruit:** Apple, apricot, bananas, cherries (sour) blueberries, cantaloupe, grapes, strawberries, kiwi, watermelon, nectarines. Avoid dried fruit of any kind. **Nuts/Seeds:** Acorns, pumpkin seeds, almonds, hazelnuts, macadamia nuts, walnuts, pecans, pistachios, peanuts, sesame seeds. Avoid cashews, sunflower seeds, dried corn & pine nuts. **Something to chew on:** Antlers, tree branches, sea shells, big rocks, cuttlebone or other calcium/mineral block. **Avoid** pet treats, starchy & sugary foods, junk food. **Natural sunlight:** at least 1 hour per day. Indoor cage should be mobile or stationary cage should have access to natural light sunning area.

Squirrel pox: or squirrel fibroma is a viral disease that produces multiple tumors on the skin of gray and fox squirrels. It belongs to the pox group of viruses which produce rabbit fibromatosis, rabbit myxomatosis, hare fibromatosis and some deer fibromas. These **tumors are presumably all caused by a virus.** Although the natural history of the virus is not known, mosquitoes have transmitted it from squirrel to squirrel in the laboratory. It is probably transmitted by insects in nature as well. The tumors develop at the site where the insects feed. Tumors may be scattered all over the body and range in size from a few mm to 25mm in diameter. Metastasis to the lungs, liver, kidney, and lymph nodes has been reported. Can spread through animal to animal contact. In general, there are no obvious signs of illness in naturally infected squirrels except for the presence of the tumors over the skin. In severe cases, when vision is obstructed or the skin becomes secondarily infected, the animal may be less active, weak, and eventually die. **Note: The disease is of no public health significance. The virus is not transmissible to humans.** Grey squirrels rarely die from this disease because the population has developed immunity having been exposed to the virus for many years; however, they are still carriers of the infection and can spread the disease to red squirrels. Pox in red squirrels causes skin ulcers, lesions and scabs with swelling and discharge around the eyes, mouth, feet and genitalia. The squirrels become increasingly lethargic, largely due to a failure to feed, as the virus progresses further resulting in death generally within 15 days. **Treatment: Isolation. Zovirax** is a treatment for pox. Acyclovir is the generic name for "Zovirax" which is a trade name. It's available in liquid suspension, capsules, tablets, ointment and a dermal cream. Suspension is available only in a 200mg/5ml strength and is administered orally. **Zovirax** is an antiviral drug. It slows the growth and spread of the herpes virus so that the body can fight off the infection. **Or** you can opt not to use medication and **isolate squirrel** to minimize the spread of pox to squirrel population, and let the pox run its course.



Squirrel Caging: An indoor cage should be at least 24 inches wide by 24 inches deep and at least 3 feet tall depending on the number of resident squirrels.



The outdoor cage can be made from ½ inch welded wire or strong hardware cloth. The cage needs to be as large as possible or 4' x 8' x 8' (NWRA standard) and designed using 2 x 4 posts to make a frame. Squirrels require vertical height more than horizontal space. Make sure it is predator proof. Dirt or sand floors should have hardware cloth or plywood buried along the interior sides of the cage, approximately 12" below the surface to prevent escape. It should have lots of branches and limbs for climbing and gnawing inside. A nest box should be available on an upper side or in a corner of the cage under a cover to protect it from the rain. It may take 2 to 3 weeks before the squirrels get used to being outside and are big, fast and furious enough to be released. Most squirrels will come back to the box in the cage for a week or so because they don't know how to make a nest yet. Continue to supply food and water for a few weeks after release.

NWRA STANDARDS: 4'W x 8'L x 8'H for tree squirrels. (single animal cage sizes). 1 square foot needs to be added for each additional animal.

Nesting: (Tree) squirrels build two general types of nests: tree cavity dens and leaf & twig nests called dreys. Squirrels are active all year round. You may not see them as often in the Winter since they choose to stay in their nests to conserve body heat.



When we get calls for unwanted Squirrel Presence (gardens, attics, walls, chimneys, soffits)

Repellents: (safest for the squirrels)

<u>Fox Urine</u>	<u>liquid spray</u>
<u>Shake-away</u>	<u>granules</u>
<u>Ro-pel</u>	<u>liquid soak or spray</u>
<u>Critter Ridder</u>	<u>granules or spray</u>
<u>Squirrel Away</u>	<u>granules</u>
<u>Yard Guard</u>	<u>ultrasonic repellent</u>
<u>Bird-Xnetting</u>	<u>hard-to-chew netting wrap</u>
<u>Evictor Strobe Lights</u>	<u>high intensity strobe lights</u>
<u>Mr. McGregor's Fence</u>	<u>(\$150.00) electric fence</u>

Use live traps for chimney extraction.

Q & A

Thank you for caring and keep in touch!

Linda Bergman-Althouse
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HAPPY POST HOLIDAYS!