



Queen, Neonatal, and Infant Kitten Care

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INTRODUCTION

The original Neonatal Kitten Care handbook was developed by Joan E. Bush in response to the need for trained individuals to care for abandoned kittens found in San Francisco each year. The program's intent was to bring together individuals interested in the welfare of San Francisco's abandoned kittens. Unfortunately, the program no longer exists. Alley Cat Allies received permission to reprint the Neonatal Kitten Care handbook and distribute it because similar problems exist nationwide.

This handbook has been modified to contain up-to-date medical information as well as Feline Rescue's current policies and procedures in caring for neonatal kittens. Sections about caring for pregnant queens before, during, and after birth have also been added. These rely heavily on information provided by International Cat Care, the non-profit arm of the International Society for Feline Medicine.

Some of the skills for neonatal care described herein require special training, and this will be provided by the Veterinary Services department as required. Please do not attempt tube feeding or subcutaneous fluid administration without prior training by Veterinary Services. Significant harm, including death, can result if these procedures are done incorrectly or unnecessarily.

Caring for neonatal kittens is time consuming, and at times, physically and emotionally difficult work. However, participating in a process that turns fragile newborns into healthy adoptable kittens is an enriching experience. We hope, as the original authors did, that many individuals will want to participate in this process, and that together we can substantially increase the number of neonatal kittens saved.

CARE FOR THE PREGNANT OR NURSING QUEEN

General Information

The term “queen” refers to an unspayed female cat. A pregnant or nursing queen needs a stable environment, protection from various diseases, and consistent, specialized nutrition to give her and her kittens the best chance of good health throughout pregnancy, birth, nursing, and adoption. The majority of feline pregnancies and births occur without complication, but this section will prepare you for what to expect and when to be concerned.

Feline Pregnancy

A cat’s pregnancy generally lasts about nine weeks (58-72 days.) Throughout pregnancy and nursing the queen should be fed unlimited amounts of canned and dry food that meet the AAFCO requirements for “growth” or “all life stages.” This ensures that she and her kittens have adequate nutrients and calories for the monumental changes their bodies undergo. The food brands and flavors offered should remain consistent to avoid causing vomiting or diarrhea, and clean fresh water that is changed daily should be available at all times.

Early in pregnancy the queen may show no signs other than not going back into heat. At 3-4 weeks into gestation the queen will begin to appear “pot-bellied,” with a larger, rounder abdomen than normal and less fat overlying her ribs. At this stage a veterinarian can use an ultrasound to search for uterine swellings to confirm pregnancy. Fetal heartbeats should also be visible inside of any living kittens, but the number of kittens cannot be reliably determined in this way. When the kittens are 6-7 weeks into gestation, x-ray can be used to identify fetal skeletons in the uterus, providing a more reliable fetal count. Feline Rescue generally reserves such testing for cats whose pregnancy is prolonged or if retained kittens are suspected after a queen gives birth.

As the pregnancy progresses, the queen’s belly will continue to grow, and she may lose fat and muscle along her ribs, shoulders, hips, and spine. A few weeks before her due date, her nipples will become pink, the veins on her belly will enlarge, and her mammary glands will begin to swell. Odd, angular shapes may also be visible along her body wall as the kittens grow and move about inside their placental sacs.

Approximately 1 week before her due date, the queen’s temperament may change. She may go to extreme lengths to discover a dark enclosed space well away from human contact or she may increasingly seek comfort from her caretakers. At this point, she should be housed in a quiet place, apart from other animals, with food, water, a litter box, toys, and multiple blankets, beds, and hiding places so that she can engage in nesting behavior. Feline Rescue has provided a large plastic tub that should be placed on its side and lined with a blanket or towel atop a washable pee pad to create a covered shelter for birthing. If the queen prefers another location in the room, allow her to create and stay in the nest of her choosing until after the kittens are born.

Birth Stages

During pregnancy kittens reside in both horns of the uterus. Each kitten is contained within its own membranes and has its own placenta through which it derives nourishment. The uterus may be considered as a muscular, sausage-shaped bag, capable of contracting both around its diameter and along its length. To help in its passage, each kitten is contained within a fairly tough double-layered bag of membranes, which are filled with slippery fluid in which the fetus floats.

Birth (parturition) is generally described in three stages; however, in cats the second and third stages are repeated with each kitten, and the third stage is brief and nearly continuous with the second.

First Stage Parturition

In this stage the cervix and vagina begin to relax and uterine contractions begin. Uterine contractions must always be interrupted by periods of relaxation, otherwise, the blood supply to the kitten would be cut off. The pelvic muscles slacken and the perineum (the area between the anus and vulva) becomes looser and longer. Uterine contractions are not yet observable as straining, although movement of the kittens may be felt through the abdominal wall. There is little else to see at this stage except for repeated visits to the prospective kittening bed, and in the dependent type of cat, an apparent desire for reassurance from the owner. Some scratching up and bed-making occurs, and panting may be seen as a late first stage feature. Vaginal discharge is rarely seen and is usually licked away promptly by the cat. In the cat kittening for the first time, the first stage can be very prolonged, even lasting up to 36 hours without being abnormal.

Second and Third Stage Parturition

After the relaxation of the first stage, the uterine contractions become stronger and more frequent and drive the first kitten, contained within its membranes, towards and into the pelvic opening. As the first kitten enters the pelvis, the outer layer of the membranes appears briefly at the vulva as the 'water bag', which bursts and sheds some fluid which is usually cleared up by the cat. The inner layer passes into the pelvis and retains some of the fluid which acts as a lubricant to assist the kitten's passage.

The cat pushes to help the kitten through the pelvis. This is usually the point at which the owner can see that the cat is actually straining. Normally, delivery of a kitten from the beginning of the second stage may take from five to 30 minutes. Once the head is out, one or two more strains should complete the passage of the kitten.

The third stage follows immediately and is seen simply as the passage of the membranes, complete with the dark flesh-colored mass of separated placenta, the 'after-birth'.

Normally, each set of membranes is passed immediately after each kitten. However, sometimes a second kitten will follow so quickly from the opposite uterine horn that the membranes from the first will be trapped temporarily and the two sets will be passed together.

As each kitten is born the queen will tear open the membranes, clear the mouth and nose area of the kitten, bite off the umbilical cord, and subsequently eat the afterbirth. Second and third stages of labor are repeated as each kitten is born. The interval between kittens varies, from 10 to 60 minutes in the average case. While cats usually have an average of 4 kittens in each litter, this can range from 1 - 12 kittens. Larger litters are seen more frequently in pedigree breeds such as Oriental, Siamese and Burmese.

Sometimes, when one or more kittens have been born, the mother will cease straining and rest happily, suckling those kittens already born. She will accept food and drink and is in every way completely normal except that it is obvious from her size and shape, and the presence of movement, that there are still kittens waiting to be born. **This resting stage may last up to 24 or even 36 hours, after which straining recommences, is clearly productive, and the remainder of the litter is born normally and easily.**

Birthing Complications and Interventions

Approximately 97% of mixed-breed cats give birth without issue, and queens should not be interfered with if kittening is progressing normally. However, some cats—especially purebred cats with extreme features like Siamese and Persians—experience difficulty. It is therefore important to be able to recognize a problem when it arises.

Dystocia

Dystocia (difficult birth) can occur due to large kittens, small birth canals, malpositioned kittens, pelvic blockages, fetal defects, uterine weakness, uterine twisting, or uterine tearing. Cats who are purebred, older, sick, severely stressed, or overweight are more likely to have these problems. **If a heavily pregnant queen is restless, panting, crying, demanding attention, straining to birth and not passing a kitten within 30 minutes, or suddenly seems ill, exhausted, or weak she must be taken to a veterinarian immediately.**

Inhibitory or Hysterical Behavior

Inhibitory or hysterical behavior may cause delay when the kitten is already through the maternal pelvis and protruding through the vulva. This causes pain, so at this point the queen may appear to give up trying and wait for help or may demand help with restless pacing and crying. **Attempt to calm the cat, but if this behavior lasts more than 5 minutes you must intervene to assist the birth of the kitten if the mother will allow it (see below.)**

Malpresentation

Tail-first kittens occur quite frequently, so much so that it could *almost* be considered normal. However, if a kitten comes tail-first there may be delay in its passage due to the lack of a wedge-shaped head at the front to push the fluid-filled membranes forward. The kitten is usually passed eventually, but it does have an increased risk of drowning if the time from placental separation to when its nose is freed from its membranes is too prolonged. **If the time from presentation of the kitten at the vulva to full birth is greater than 5 minutes, intervene to speed the kitten's passage if the mother will allow it (see below.)**

Assisting Parturition

Only try to assist the queen if she or a kitten are struggling as described above and if she will allow it. **If she is struggling and will not allow help, or if your help is not proving effective, take her and any kittens that have already been born to a veterinarian immediately.**

Feeling the space between the vagina and anus (the perineum), a lump will be present if a kitten is already through the pelvis but not yet visible at the vaginal opening. **A view of the nose or of feet and a tail at the vulva indicates that birth must occur within the next few minutes if the kitten is to live.**

- 1) If it is coming head first, immediately clear the membranes away from the kitten's nose and mouth to allow breathing to take place.
- 2) The kitten must then be eased gently out, alternating the direction of traction, first freeing one side then the other, and always directing the pull slightly downwards.
- 3) Since kittens are slippery and wet at birth, clean pieces of toweling or soft paper towels may help to get a grip.
- 4) If the kitten has only the tail and hind-legs showing, delivery is even more urgent and the problem of holding the slippery subject more difficult, but the same principle applies. Hold the hind legs above the hocks (ankles,) and ease gently to alternate sides.
- 5) If progress is not made with the aid of a strain or two on the cat's part, try gentle rotation through a few degrees before continuing the easing-out process, alternating the direction of pull.
- 6) **Pull and traction are probably misleading words to use here to convey the sensitivity required to co-operate with the cat as she strains and rests momentarily in between,** so that progress continues without fear of injury to cat or kitten. Make haste slowly.
- 7) Immediately after the kitten is out, clear the mouth and nose of all membranes and fluid. If necessary, use a plastic straw to reach the back of the kitten's mouth to administer suction.

If the queen is straining and nothing can be felt at the perineum, the problem must be further forward. **Take the queen and any kittens that have already been born to a veterinarian immediately.** Surgery is most likely required.

Kitten revival after birth

The average mother cat will generally do a better job of cleaning and drying her kittens than any human. **Do not interfere** unless a kitten had a delayed birth, required assistance to be born, is not breathing, or is being ignored by its mother.

- 1) Tear the membranes from the nose and mouth, wipe them clear, and open the mouth.
- 2) Tilt the kitten upside-down, with its head hanging, and GENTLY swing it back and forth. Clear away any fluid that runs out.
- 3) **If the kitten was born tail-first**, clear debris and fluid from its air passages. Use a small catheter attached to a 5 ml syringe to gently suction the nose, mouth, and throat. This may also cause the kitten to sneeze and cough, which is helpful.
- 4) If the cord has not broken on delivery, tear it, leaving two inches of cord attached to the kitten's belly. **Do not pull on the kitten's umbilical attachment.** There should be minimal bleeding, but use a short piece of floss to tightly tie off the end if more than a few drops fall. Do not forget to remove the floss after a few hours to prevent the mother from ingesting it later.
- 5) Next, rub the kitten's belly with short stroking motions with a clean towel. This imitates the mother cat's licking and stimulates breathing. Follow this with a brisk general rub to dry the kitten, warm it, and further encourage breathing.
- 6) **If the kitten is still not breathing or is not vigorous, mouth-to-mouth respiration can be tried, but only if very carefully carried out:**
 - i. Make sure that all debris has been cleared from the nose and mouth.
 - ii. **The capacity of kitten lungs is TINY compared to human lungs**, and over-inflating them can cause damage. Blow very small amounts of air very gently into the nose and mouth, then allow a pause for expiration. Repeat this cycle every 3 - 5 seconds.
 - iii. Breathing into the kitten's airway through a small drinking straw may help to reduce the risk of over-inflating the kitten's lungs and will be more hygienic than direct mouth-to-mouth resuscitation. Take care not to cut the kitten's lips, gums, or throat when placing the straw into the back of the mouth.
 - iv. **Not all kittens can be revived.** This is a simple fact of nature. In general, attempts to revive the kitten should be discontinued after 5 minutes. Note that kittens will RARELY start to spontaneously breathe on their own up to 30 minutes after birth. For this reason you should wrap any kitten who appears deceased in a warm towel and check them occasionally for breathing during those 30 minutes.

Umbilical entanglement

If the queen does not chew through each kitten's umbilical cord as it is born, kittens can become entangled in their cords or placentas. A kitten entangled in an umbilical cord may lose a limb if the cord wraps around a leg, be strangled if the cord wraps around its neck, or develop internal bleeding if the cord is pulled at its attachment to the body wall. As mentioned above, any cord not broken during or shortly after delivery should be torn off two inches from the body wall, and floss can be used to temporarily tie off cords that bleed afterward.

If a group of kittens is found tangled together, it will be difficult to untangle them safely. If you are able, carefully cut the cords apart using a scissors with a rounded end for safety. **If you cannot safely disentangle the kittens or if you find a kitten who appears to have been injured by a cord take them to a veterinarian immediately.**

Immediate Post-birthing Care

Iodine spray

After each kitten is born and its umbilical cord has been severed, the cut end of the cord, the cord's full length, and its attachment at the belly button must be sprayed with iodine on all sides. This step reduces the kitten's risk of dying from bacterial infection early in life. The queen should be prevented from grooming the kitten's belly until the iodine has had a chance to dry.

Weight

After each kitten has been cleaned, dried, and had a chance to nurse from its mother, it must be weighed on a gram scale. The starting weight of each kitten must be recorded and reported to Veterinary Services, preferably by email. Kittens who weigh at least 90 grams at birth have greater rates of survival, so any kitten weighing less than this must be watched closely and may require extra feeding or nursing care.

Warmth

Providing warmth is essential for a newborn. A kitten cannot react to cold by shivering and cannot control its own body temperature. Normally, the kitten's immediate environment is 101-103° F due to warmth obtained by body contact with the mother and conserved by nesting materials. Making sure the kitten is dry is essential, as a newborn wet kitten loses heat very rapidly. Follow this—if the mother is ill or not cooperative—by placing the kitten on a dry blanket atop a warmed, fleece-covered Snuggle Safe. **Take great care not to inflict contact burns** by overheating the Snuggle Safe or having it incompletely enclosed in its fleece cover. Place a blanket over the top of the kitten, and see the “Environment” section in the “Neonatal Kitten Care” chapter for further instructions.

Nutrition

Newborn kittens should nurse almost immediately after birth. A kitten who is lethargic at birth might benefit from a small drop of corn syrup rubbed onto its gums. This small infusion of sugar may give the kitten enough energy to nurse from its mother and receive colostrum, an antibody-rich first milk that the mother makes to provide disease protection to her new babies. **Colostrum is most effectively absorbed within the first 2 hours of life**, so encourage any wandering kittens to nurse by placing them back near the mother, facing her nipples.

If a kitten has not nursed within 3 hours of birth, it will require supplemental feeding of commercial kitten formula. See the feeding section of the next chapter for more information.

After feeding, place the kitten back with the mother to encourage nursing, but repeat feeding every 3 hours if the kitten is not nursing well.

Once a kitten has been cleaned, dried, spritzed with iodine, weighed, and fed, it should be left to sleep with its siblings in its warm nest. Avoid handling neonatal kittens unnecessarily. This stresses them and increases their risk of bacterial and viral infections.

Post-kittening Complications of the Queen

Retention of fetal membranes

Occasionally a cat may fail to pass the final set of fetal membranes after birthing appears to be complete. She will probably be restless, have abdominal discomfort, and be unwilling to settle with her kittens during the 24-72 hours after parturition. Her appetite will probably be poor, a brownish vaginal discharge may be seen, and her temperature will most likely be elevated. **An urgent veterinary visit is required.**

Metritis

Metritis (inflammation of the uterus) occasionally occurs within 3 days of parturition. The queen is much sicker than with retention of fetal membranes. She will be dull, lethargic, ignore her kittens, refuse food, drink excessively, and may vomit. A thickened, foul-smelling vaginal discharge is present along with fever and pain. **An emergency veterinary visit is required or the queen may die.**

Uterine prolapse

Uterine prolapse describes telescoping of the uterus into or through the vulva. Initially, the cat is straining and uncomfortable despite the completion of parturition. Then pink or red tissue is visible bulging within or protruding out of the vulva. The cat will rapidly become dull, lethargic, and go into shock. **An emergency veterinary visit is required or the queen may die.**

Mastitis

Mastitis (inflammation of the mammary glands) sometimes occurs during early lactation. It is usually confined to one gland, which will be tense, hot, painful and enlarged. If it is only due to milk congestion, applying a warm compress for 5-15 minutes followed by gentle massage of the gland should bring normal milk out of the teat orifice. If this occurs, having a kitten to nurse from this gland or milking the gland by hand may permanently resolve the issue. If the cat is too painful or resistant to massage, if these steps do not resolve the issue, if the gland turns red or purple, if the liquid that is expressed is yellow, green, pink, red, brown or foul-smelling, or if the cat loses its appetite, becomes mentally dull, or develops a fever, **an urgent veterinary visit is required.**

Lactation tetany

Lactation tetany could occur before, during, or after parturition. Most cases occur 2-8 weeks post-kittening, often affecting cats producing milk for a large litter. Early signs usually include lack of coordination and muscular spasms. If not treated promptly, symptoms progress to collapse and coma. **An emergency veterinary visit is required or the queen may die.** Kittens should be separated from the mother if at least 6 weeks-old. They must be given supplemental feeding if they are too young to be weaned.

NEONATAL KITTEN CARE

General Information

Developmental Milestones in Kittens

From “Playing Mum: Successful management of Orphaned Kittens” by Dr. Susan Little

Milestone		Age
Umbilical cord falls off		3 days
Voluntary elimination of urine and feces		3 weeks
Eyes	Eyelids open	7–10 days (average)
	Menace/pupillary light reflexes present	28 days or later
	Normal vision	30 days
	Adult iris color	4–6 weeks
Ears	Ear canals open	9 days (average)
	Functional hearing	4–6 weeks
Locomotion	Crawling	7–14 days
	Walking	14–21 days
Teeth	Deciduous incisors/canines erupt	3–4 weeks
	Deciduous premolars erupt	5–6 weeks

The term neonatal refers to kittens from birth to 2 weeks of age. Kittens are very fragile during these first weeks and are naturally dependent upon their mother for protection, warmth, nutrition and to boost their immune systems.

Healthy newborns cared for by their mother are a vision of contentment. They spend 90% of their time sleeping against her warmth, and 10% of their time eagerly nursing. Most mother cats take meticulous care of their litters, keeping the nest and each kitten clean. They can also be extremely protective of their newborns and will behave aggressively or move them to a new location if they feel threatened.

Orphaned neonatal kittens or those ignored by their mother present a very different picture. Cold, hungry, and unprotected, they cry loudly and often. Without the warmth of a mother they are unable to sustain their body temperature, and without assistance they will slip into a coma and die. Great care must be taken to keep them warm, clean, and well fed as their mother ideally would have.

Birth Weight

A healthy kitten will generally weigh 90-110 g at birth. A 10% weight loss within the first 24 hours of life is often normal, but greater weight loss, ongoing weight loss, or failure to start regaining weight by the third day of life, is cause for concern. From their third day of life

onward, a kitten should gain 10-15% in body weight daily. They should double their weight by 1 week of age.

A template chart for tracking kittens' weights and other health parameters is located in the back of the handbook. Weigh the kitten every 12 hours for the first 2 weeks of life, then every 24 hours until they reach 6 weeks-old. Aim to weigh them at approximately the same times each day, preferably before feeding them, and record the weights for each individual kitten. Report weight loss, failure to gain weight, or gaining weight more slowly than expected to Veterinary Services.

Environment

As mentioned in the previous section, providing warmth is essential for a newborn. A young neonatal kitten cannot control their own body temperature, which is normally 97-98° F. If the kitten has a mother and adequate nesting materials, she will keep the kitten's immediate environment between 101-103° F with her body heat. If there is no mother to provide warmth, it is important to mimic this environment.

Turn the provided plastic tote upright and place a towel or peed pad in the bottom. Place a warmed, fleece-wrapped Snuggle Safe in the bottom and place 1-2 layers of soft, dry blanket over it. Surround the heat disc on three sides with blankets, leaving one edge of the nest clear so the kitten can move away from the heat and return to it if they choose to. **Take great care not to inflict contact burns by overheating the Snuggle Safe or having it incompletely enclosed in its fleece cover.** Place the kitten in the nest and lay a light blanket over top of them.

Place the provided hygro-thermometer inside the tote near the nest to ensure that the environment immediately surrounding the kittens is warm and moist. The ideal temperature varies by age:

Optimal Temperature for the Immediate Environment of Orphaned Kittens

From "Playing Mum: Successful management of Orphaned Kittens" by Dr. Susan Little

	°C	°F
Week 1	32–34	89.5–93
Week 2	27–29	81–84
Week 3	24–27	75–81
Weeks 4–12	24	75

The ideal humidity is 55-60%. An electric space heater with tip-over protection and a humidifier should be placed near the tote to try to maintain these conditions. Check the highs and lows recorded on the hygro-thermometer and reset them daily so you can determine if adequate heat and humidity are reaching the kitten at all times.

Cleanliness

Keeping the kitten and their environment clean and dry is essential. You must wash your hands before and after working with a kitten or you could transmit viruses, bacteria, and parasites between the kitten and other animals in your home. You must also keep the kitten and their blankets free of food, feces, and urine or the kitten will be prone to illness, skin infections, chill, and distress. Keep spare items on hand and do laundry frequently so you have enough supplies to change out soiled items as often as necessary.

Emotional Comfort

All kittens are born with closed eyes and closed ear canals. They can neither see nor hear well during the first 1-2 weeks of life. They find their way to their mother by sensing the heat generated by her body, and her heartbeat is a comfortable, familiar feeling. When you visit with the kitten, take care of their physiological needs first, but once you've finished, spend time with them resting on your chest while you pet them. You can gently stroke the kitten with your fingers or with the toothbrush provided. The toothbrush has a rough texture that may simulate a mother's tongue, and stroking the kitten's forehead and back with it may feel like a mother's grooming.

To comfort the kitten when they are in the nest, a stuffed-animal surrogate has been supplied. It must be kept clean and dry with regular spot cleaning, the heartbeat within it should be kept on at all times, and its internal heat pack, if present, should be kept warm according to package directions. This will provide the kitten with another heat source and a feeling of security and comfort.

Urination and Defecation

Kittens 3 weeks-old and younger are unable to pass urine and feces without stimulation. Queens provide this stimulation with their tongues and eat the waste products to keep the nest clean. An orphan kitten needs their caretaker to use toilet paper or soft paper towels to recreate that sensation on their anogenital region and clear away their waste products. Stimulation can be done before or after the kitten eats, but doing it beforehand can improve their appetite.

To stimulate the kitten, hold them on their back and use light pressure to brush the toilet paper up and down their anus and genitals. Within 1 minute you should notice drops of urine and/or fecal matter being passed. Continue to stimulate the kitten until they stop passing waste products. Afterward, gently clean the waste residue from the kitten's skin with a warm, damp washcloth, **wiping in one direction-from the belly toward the tail-** to keep feces away from the kitten's genitals. Dry the kitten with a fresh towel immediately after cleaning to help it keep warm.

Record the color of the kitten's urine. It should have a slight yellow hue and be mostly clear. Medium to dark yellow urine may indicate dehydration, and the formula should be diluted 10% with water. The humidity of the room may also need to be increased. Pink, red, or brown urine may indicate a urinary tract infection. Notify Veterinary Services if you see these colors or if truly yellow urine persists after adjusting the environment and formula.

Also record the color and character of the kitten's feces. Healthy kittens eating milk or milk replacer will have light yellow to light brown stools that are mostly formed. **Abnormal stool colors, stools that are looser than the consistency of toothpaste, or a kitten who does not pass stool for 24 hours should be reported to Veterinary Services.**

Diarrhea

Some cases of diarrhea in kittens will respond to a temporary diet adjustment. Any kitten with liquid stool should have their formula diluted to ½ strength by mixing it 1:1 with Dextrolyte solution for the next 4 feedings. They should also have their daily formula intake volume reduced by 10% for 4 days.

A kitten with diarrhea needs additional nursing care. You should check on them every hour, wash them as needed, and fold over or change soiled blankets in their tub to keep the kitten clean and dry. After washing and drying a soiled kitten, apply a light layer of petroleum jelly to any reddened skin on their belly, legs, genitals, anus or tail to protect the area from further irritation. **If the skin becomes chapped, cracked, or thickened or if the kitten's anus protrudes even when it is not trying to defecate, notify Veterinary Services.**

Veterinary Services may ask for a recent stool sample from any kitten with diarrhea. Keep one that is less than 24 hours old in your refrigerator until you speak with them.

Constipation

Kittens who strain to pass hard stools or who do not defecate for 24 hours are probably constipated. This often results from dehydration. Add 20% more water to their formula for 24 hours and monitor them for a response. **If they are still unable to pass a normally formed stool, notify Veterinary Services.**

Nutrition & Feeding

A kitten without a lactating, attentive mother, who isn't adept at nursing, or who is a runty member of a large litter will require feeding with commercial kitten formula. Frequent feedings are required to maintain adequate blood sugar levels and hydration and to provide energy for metabolism and growth. It is important that these feedings be distributed evenly throughout the day and night to keep from overloading the kitten's kidneys and digestive system.

The milks or infant formulas of other species are NOT appropriate substitutes for a queen's milk. Using these can compromise a kitten's development and lead to permanent growth defects.

Commercial feline milk replacers closely match the nutrients provided in a queen’s milk. Formula should be fed according to the manufacturer’s label instructions—approximately 8 mL of formula per 30 grams of kitten body weight per day. Refer to the following chart for approximate feeding amounts and frequency:

Kitten Feeding Chart

From “Orphan Kittens: A Guide to Saving the Tiniest Felines” by Hannah Shaw and Sonja Lueschen

AGE	WEIGHT	AMOUNT PER FEEDING	SCHEDULE
0-1 week	50-150 grams	2-6 ml	Every 2 hours
1-2 weeks	150-250 grams	6-10 ml	Every 2-3 hours
2-3 weeks	250-350 grams	10-14 ml	Every 3-4 hours
3-4 weeks	350-450 grams	14-18 ml	Every 4-5 hours
4-5 weeks	450-550 grams	18-22 ml	Every 5-6 hours
5-8 weeks	550-850 grams	(weaning; offer ample wet food)	Every 6 hours

A kitten’s stomach, which is found on the left side of their body just behind their ribs, should feel full but not tense after a feeding. If a kitten is unable to take in the amount of formula planned for each meal the number of feedings should be increased and the amount of formula per feeding decreased. **If the kitten is failing to gain weight or frequently seems sleepier than normal, notify Veterinary Services.**

NEVER FEED A KITTEN IF IT IS CHILLED. Signs of chilling include a kitten who feels cool to the touch, who is less active/sleepier than normal, and who has a low body temperature. **If you are concerned that a kitten is chilled, use a rectal thermometer to check the kitten’s body temperature.** Place a disposable sheath over the thermometer and squeeze lubricant onto the end before inserting the silver tip of the thermometer into the kitten’s anus. Run the thermometer twice without removing it and record the second temperature reading obtained. Normal body temperature varies by the age of the kitten:

Normal Kitten Body Temperatures

From Small Animal Pediatrics: The first 12 months of life by Michael Peterson and Michelle Kutzler

Week	Normal rectal temperature
Week 1	95° to 99° F (35° to 37.2° C)
Weeks 2-3	97° to 100° F (36.1° to 37.8° C)
Week 4	99° to 101° F (37.2° to 38.3° C)

If a kitten is chilled, refer to the “Emergency Care” chapter for instructions on rewarming.

Feeding

Formula may come pre-mixed or powdered. Mix powdered formula according to its package directions, and eliminate any lumps large enough to clog your feeding tube or nipple. If you are treating a sick kitten, dilute the formula according to the instructions provided in the previous section or those given by Veterinary Services.

Warm the formula to approximately 100 °F prior to use, heating it a little at a time and mixing it frequently to eliminate hot spots. **The temperature of the formula MUST be tested on the skin of your inner wrist prior to offering it to kittens to eat.** It should feel warm but not hot, and it may need reheating between kittens if you are using a small amount or have a large litter to feed.

There are three main methods for feeding a neonatal kitten—by syringe, bottle, and tube. It is best to syringe feed kittens less than 3 weeks-old so that the amount of formula they ingest can be tracked exactly. Kittens 3 weeks-old or older can be syringe or bottle-fed, and starting at 3 weeks kittens should also be offered formula in a shallow saucer for 30 minutes before their feedings. This will encourage them to explore the food, get it on their fur, and taste it while grooming themselves, which encourages them toward weaning. Tube feeding is reserve for kittens who are too weak, unable, or unwilling to drink from a syringe or bottle. **Never tube feed a kitten without prior instruction from Veterinary Services.**

Syringe Feeding: Preferred method for feeding kittens less than 3 weeks old

The easiest method of syringe feeding is to attach a Miracle Nipple to the end of a syringe that is large enough for the full volume of the kitten's meal to be drawn up. The kitten should be placed feet-down on a soft surface and the formula-coated nipple should be gently inserted in the center of their mouth. It may take a few minutes of trying to hold the kitten still and get it to latch onto the nipple, but once it is firmly attached a kitten with a strong suckle reflex may be able to move the plunger of the syringe without assistance. Hold the plunger so that the kitten's head tilts up slightly while drinking.

Some syringes have more drag on the plunger, and light pressure on the end of it can assist the kitten in pulling out the syringe's contents. Do not force formula into the kitten's mouth when it is strongly latched. This can cause the kitten to inhale the fluid and can threaten its life.

If a kitten refuses to latch strongly, small amounts of formula can be dripped into its mouth, allowing it time to swallow and breathe in between. If the formula bubbles out of the kitten's mouth or nose, you are giving too much too rapidly and must slow down to prevent the kitten from inhaling the fluid.

If the kitten is unwilling to hold still for feeding or is initially uninterested in its meal, wrap it in a clean dry cloth that pins its front feet at its sides but leaves its face poking out. Hold the wrap with one hand to prevent the kitten from escaping, and tip the kitten upright to make fitting the nipple into its mouth easier. **Never tilt the kitten backward during feeding**, as this increases their risk of inhaling the formula.

Once the kitten has stopped willingly eating, record how much formula was actually eaten. Rub and gently pat the kitten's back to encourage it to burp up any bubbles that were consumed. If you haven't already, stimulate the kitten to urinate and defecate. Then clean all traces of milk, urine, and feces from the kitten's face and coat with a damp washcloth, and fully dry the kitten before putting it back in the nest to sleep.

As mentioned previously, if the kitten is not eating the expected amount for its weight each meal, increase the number of feedings offered per day. **If the kitten still is not consuming an adequate amount of formula, notify Veterinary Services.**

Bottle Feeding: Alternate method of feeding kittens of any age

Rarely, kittens may not like the Miracle Nipple and may respond better to a different nipple shape. Alternate shapes are available in the bottle baby kits. Other nipples are not made for use with syringes, so use of a bottle will be required. You may also need to cut or poke a hole in the tip of other nipples. The hole should be large enough to allow milk to drop slowly from the nipple tip when the bottle is inverted.

Even kittens who respond well to the Miracle Nipple and syringe feeding will have to transition to bottle feeding eventually. As kittens grow larger, it stops being possible to fit the amount of formula they need per meal into a single syringe from which they can successfully suction formula. At this point, the Miracle Nipple can be used with a plastic baby bottle, which will cave in as the kitten nurses. Kittens who are old enough to have erupting teeth may need to switch to one of the larger, rubberier nipples in the bottle baby kit if they tear holes in their Miracle Nipples.

Tube Feeding: For kittens too weak or ill to suckle appropriately

The advantages of tube feeding are that it is time saving, easy to learn, precisely administers the amount of formula that is needed, and often means the difference between life and death for struggling kittens. The disadvantage of tube feeding is that it must be done carefully to avoid dispensing formula into the lungs. Placing formula in a kitten's lungs can lead to **drowning, pneumonia, and death. This is why tube feeding should only be done by foster caregivers who have been trained by Veterinary Services.**

The first step in tube feeding is to estimate how deeply the tube should be placed in order to reach the kitten's stomach. Hold the empty tube next to the kitten and note the distance from the kitten's lips to its last rib. Mark the tube at the level of the lips with tape or a permanent marker. If feeding multiple kittens, be sure to record whose mark is whose. Update these marks 1-2 times per week to keep up with the kitten's growth.

Prepare the formula as mentioned above. Pre-mixed formula is preferred for tube feeding because it is free from lumps. If you have to use reconstituted formula, mix it in a blender, then wait for several minutes afterwards to allow the bubbles time to work their way out. You can speed up this process by gently tapping on the side of the glass. Rewarm the formula afterward

if necessary, **always remembering to check it against your skin RIGHT BEFORE feeding it to a kitten.**

Draw up 0.5 mL of warm water into the kitten's feeding syringe. Invert the syringe and push the plunger to push bubbles out of the syringe. Push the feeding tube onto the front of the syringe, and depress the syringe's plunger until a drop of water exits the end of the tube. Then pull back 0.1 mL on the plunger.

Wrap the kitten in a towel so that its face is exposed but its arms and body are contained. Keep hold of the towel firmly but not so tightly that the kitten cannot expand its chest to breathe. Kittens DO NOT like to be tube fed and will try to move away or pull out the tube, especially as they get older.

Hold the kitten's head gently in place to facilitate tube placement. Hold the kitten in a natural standing position or upright- never tilt a kitten backward to place the tube as this increases the risk of the tube entering its lungs. Gently push the tip of the tube into the kitten's mouth, aiming toward the upper left side of the back of its throat. As you push the tube in, listen for a change in the kitten's meow or any coughing that might suggest that the tube is in the lungs- kittens do not have a gag reflex until at least 10 days-old.

As you advance the tube, watch how deeply it goes. A slight amount of resistance might be felt just before you reach your measured mark, when the tube passes from the esophagus to the stomach. However, if you feel a fair amount of resistance when you are more than 1 cm from reaching your mark, remove the tube, wipe it clean, and try again because the tube is most likely in the lungs.

Once you have advanced the tube to your mark, pull back on the plunger of the syringe. If you feel resistance to pulling back or if the plunger moves back toward its starting place once you let it go, you are most likely in the stomach. If you pull back on the plunger and get air, your tube is most likely in the lungs. Remove the tube, wipe it clean, and try again.

After you've pulled back on the plunger and not gotten air AND you've listened to the kittens breathing to make sure it is not struggling or coughing, advance the plunger on the syringe 0.2 mL to give a small amount of water. If the kitten coughs, wheezes, or suddenly struggles in your hand, or if you note water in the mouth, STOP giving water, remove the tube, and restart the process with 0.5 ml of water.

If the kitten does not react to receiving the first bit of water or if it momentarily becomes quiet, slowly administer the rest of the water. If the kitten continues to breathe easily, fold the feeding tube in half and pinch it closed and twist off the syringe that held the water, leaving the feeding tube in place. Attach the syringe with the warmed formula for the kitten's feeding and proceed to push the formula into the kittens stomach over the course of 1-2 minutes. Continue to monitor for any signs of breathing difficulty or formula in the mouth. Stop if either are noted.

If the kitten coughs, wheezes, or suddenly struggles in your hand after you've started giving formula, or if you note formula in the mouth, STOP. Remove the tube, and watch the

kitten for a minute to see how it behaves. If it continues to cough or has trouble breathing, do not immediately attempt to tube feed the kitten again. Instead, take the following steps:

- If symptoms are limited to a mild cough and resolve after a few minutes, send an email about the incident to Veterinary Services. Try to tube feed the kitten again after 30 minutes if it will not eat its required amount of formula by syringe or bottle.
- If the kitten is having trouble breathing, if the cough lasts more than a few minutes, or if you are unsure of how ill the kitten is, **take the kitten to an emergency clinic**. Our partner clinics should know to contact Veterinary Services.

If the kitten has managed to pull the tube out, rinse formula out of the tube, wipe the tube clean, and go back to the step where you filled the tube with water prior to placing it.

After the kitten is fully fed you can set them down on their feet and massage their back gently for a minute to encourage any bubbles to be burped up. Then clean the kitten's face and coat with a damp washcloth or paper towel to remove ALL traces of spilled formula. If the kitten is not well cleaned the formula will become a hardened, sticky mess that can lead to discomfort and skin infections later on.

Once the kitten is clean and dry, you can place it back in its warm nest to sleep. Clean and reset your supplies, and proceed to the next kitten. Generally, the same tube is used for all kittens in a litter, but if one of the kittens is ill with diarrhea, vomiting, or upper respiratory signs, notify Veterinary Services so that individual tubes can be provided.

Kittens that are tube fed do not have the opportunity to suckle. This may result in a kitten trying to suck on various body parts of itself or other kittens in the litter. Signs of inappropriate suckling include redness and wetness on a kitten's ears, toes, anus or genitals, a protruding umbilicus, anus, or genital region, swollen toes, or seeing kittens using each other to suckle. If this occurs, feed the kittens smaller amounts more frequently. If it persists, notify Veterinary Services. The offending kitten may have to be separated from the others when not being supervised, and kittens who have been suckled on will have to be monitored for resultant illness.

Overfeeding

While it seems like feeding a kitten as much as it will eat is in its best interests, kittens who are fed by artificial means- syringe, bottle, tube- are at risk for overfeeding. The kitten's immature kidneys have a limited capacity to process and excrete liquid, and fluid overload can stress the kitten's lungs and heart. Also, the kitten's digestive system is not prepared for very large meals. An excess of nutrients can overwhelm the kitten's small numbers of beneficial gut bacteria and put it at risk for diarrhea.

A kitten fed milk or formula should have stool that is the consistency of toothpaste and light yellow to brown in color. Looser stool may be a sign of mild overfeeding. If this occurs, double-check the chart on page 12 to see if you are feeding the correct amount of formula at the correct intervals. If you have been feeding the recommended amount, reduce the volume that the kitten is fed by 20%. Also, dilute the ill kitten's formula 1:1 with Dextrolyte for 3-4 meals.

When the stool appears yellow to tan and firm again you can return to feeding the full strength formula and increase the volume by 10%. If the stool does not normalize, contact Veterinary Services.

Stools that are liquid, abnormal in color, or foul smelling may indicate more serious disease, and Veterinary Services should be notified. If liquid stools persist in a kitten for more than 24 hours or if the kitten has reduced energy or vomiting, take the WHOLE LITTER to an emergency clinic.

Underfeeding

Underfeeding is life threatening to the newborn. A kitten that is underfed is restless, cries excessively, will become dehydrated, and weak, and will eventually die. A kitten that is underfed may also become chilled. If this has happened, you will have to warm and rehydrate the kitten if it is to survive (See the Emergency Section.)

Once the kitten is warm and rehydrated, double check the chart on page 12 to see if you are feeding the correct amount of formula at the correct intervals.

Keep accurate records of the kitten's weight. Weigh the kitten every 12 hours for the first 2 weeks of life, every 24 hours during weeks 3-6, and weekly thereafter. Also, aim to weigh the kitten at approximately the same times each day—preferably after pottying them but before feeding them. Report weight loss, failure to gain weight, or gaining weight more slowly than expected to Veterinary Services.

Weaning

When a healthy kitten reaches 3-4 weeks of age, they can learn to eat milk replacer or kitten food pate from a shallow dish such as a saucer. Teach the kitten to eat from the saucer by offering it for 30 minutes 5-6 times per day. Mix the milk replacer (or water, for kittens with a mother) with a small amount of kitten food pate and warm the mixture prior to feeding. Always remember to mix food after heating it and check that it feels warm on your skin but not hot.

Encourage the kitten to investigate the saucer by putting them near it or putting their feet in the food. Weaning is very messy at first—kittens often step or stumble into their food—but this is an important part of the process. Grooming themselves is one of the ways the kitten will first learn to ingest food other than milk.

Do not save any milk or canned food that is leftover after 30 minutes—discard it and wash the dishes thoroughly. Keeping the dishes clean and the food fresh prevents bacterial overgrowth and accidental food poisoning, which can result in vomiting, diarrhea, and weight loss.

Continue to bottle, syringe, or tube feed the kitten until they reliably eat from the saucer. Continue to weigh the kitten daily after they transition to make sure they are eating enough to gain weight. Once the kitten is doing well, gradually increase the amount of canned food in the

mix while decreasing the amount of milk (or water) added. By the time the bottle, syringe, or tube-fed kitten is 5-6 weeks-old they should be fully weaned.

Kittens with a mother will nurse until an older age—often for as long as the mother will tolerate them. They do this for both nutrition and for comfort. However, kittens on milk replacer are more prone to digestive issues, which is why they must be weaned at a younger age.

Introduce the kitten to dry food when it is 5-6 weeks-old. Only feed kibble specifically made for kittens because it both meets their nutritional requirements and is a good size and shape for the kitten to chew. Feeding rounded adult kibbles may lead to choking.

The kitten should have access to kibble 24/7, but their dishes must be washed and all-new food provided every 12-24 hours (depending on how messy your kitten is.) The kittens must also have continuous access to a shallow bowl of clean, fresh water from 5 weeks-old onward. This should also be washed and refreshed every 12-24 hours.

EMERGENCY CARE

General Information

One of the most important aspects of caring for a kitten is **keeping detailed records**. In addition to monitoring a kitten's weight and feedings, take notes on its general appearance, activity level, normal habits, and any symptoms of illness or other causes for concern. The more detailed your notes, the more information you will have available to help you make decisions regarding a kitten's health.

A kitten is inherently fragile. Even kittens with a mother to care for them can rapidly become hypoglycemic, chilled, dehydrated, or sick. Keeping a close eye on kittens and intervening early can mean the difference between life and death.

Warming a Chilled Kitten

A kitten is at risk of becoming chilled if they are single, orphaned, fed infrequently, or lack sufficient warmth in their nest or the surrounding environment (see chart on page 11.) **Signs of chill can include crying, feeling cool to the touch, lacking strength or energy, or slipping into a comatose state.** Check the kitten's temperature by placing a clean disposable cover on the thermometer's tapered end, lubricating and inserting the silver tip all the way into the kitten's anus. If the kitten's rectal temperature is below the normal range for its age (see chart on page 14,) rewarming must be started immediately; **HOWEVER**, the kitten must be rewarmed **slowly**—generally over 2-3 hours—to prevent secondary dehydration, shock and death.

To rewarm a chilled kitten, heat the Snuggle Safe from your kitten care kit, enclose it in its fleece cover, and wrap it in a layer of towel. Place this in a kitten carrier and place the kitten on top of it. Place a blanket over top of the kitten, but make sure that the kitten has room to move away from the Snuggle Safe if it becomes too hot. Gently rub the kitten's back and limbs with gentle pressure, moving in circular motions to stimulate circulation and breathing. Also, check its temperature every 15 minutes and transport the kitten (and its Snuggle Safe) to an emergency clinic if its temperature does not start to improve within 30 minutes. If this would mean leaving other kittens without a source of heat in their nest (a queen counts as a source of heat,) take the entire litter to the emergency clinic in the same carrier.

Chilled kittens will also have **low blood sugar and moderate to severe dehydration**. They must receive treatment to address these issues, or they may not survive. **Read on to learn about life-saving interventions for these conditions.**

Addressing Low Blood Sugar

Low blood sugar is a common problem for young kittens who become sick or chilled. However, a sick kitten may be unable to nurse, and **a chilled kitten must not be fed, or it may die.** Instead, when faced with a lethargic kitten who is chilled or sick, **mix a 1:1 solution of warm**

water and sugar, and rub a small drop (about 0.01 mL) of the mixture onto the kitten’s gums. Doing so will raise the kitten’s blood sugar level, and dosing can be repeated every 15-30 minutes until the kitten is warm and behaving normally. At this point, the kitten can return to normal feedings.

If the kitten’s attitude does not improve within 30 minutes of administering the sugar solution, transport it to an emergency clinic. Bring a heating element, such as a warmed Snuggle Safe, along for the journey. Again, if this would mean leaving other kittens without a source of heat in their nest (a queen counts as a source of heat,) take the entire litter to the emergency clinic in the same carrier.

Dehydration and Rehydration

Dehydration is excessive loss of water +/- electrolytes such as chloride, sodium and potassium. It is often caused by insufficient or infrequent milk intake, by repeated vomiting, or by diarrhea. It can also result when a chilled kitten is being rewarmed. Symptoms of dehydration include a lack of energy, weakness, and possibly poor appetite.

Hydration status can be difficult to judge in kittens less than 6 weeks-old because they naturally have less resilient skin than adults. This means that the standard “pinch test”—picking up a fold of skin along the kitten’s back and seeing if it stays tented when released—underestimates how well hydrated a kitten is. Instead, hydration should be judged by assessing the mucus membranes of the mouth:

Mucus Membrane Characteristics in Relation to % Dehydration of Kittens < 6 weeks-old

% Dehydration	Moisture Level	Color	Capillary Refill Time
0 - 5% (Normal to Mild)	Wet to sticky	Medium pink to light pink	< 2 seconds
5 – 10% (Mild to Moderate)	Sticky to dry	Light pink to pale pink	≤ 2 seconds
> 10% (Moderate to Severe)	Dry	Pale pink to white	> 2 seconds

Moisture level and color are somewhat self-explanatory. Capillary refill time is the time it takes for the mucus membranes to regain their color after being pressed on with a finger.

Oral Fluid Therapy for Mild Dehydration

If a kitten has repeated vomiting or diarrhea but their mucus membrane characteristics are not abnormal, they are probably **mildly dehydrated**. They can be fed diluted milk replacer as described in the “Overfeeding” subsection of the “Nutrition” section on page 18. However, if the kitten is not currently on milk replacer (has been weaned or is queen-fed,) feed them 1 mL of 50% Dextrolyte solution per 60 grams of body weight as frequently as the chart on page 13

recommends for its age group. For kittens older than 8 weeks, feed 1 mL of 50% Dextrolyte solution per 60 grams of body weight twice daily.

Subcutaneous Fluid Therapy for Moderate to Severe Dehydration

If a kitten is **moderately or severely dehydrated**, they need subcutaneous fluid therapy. Fluids help expand their blood volume to improve blood flow to their brain, extremities, and organs. Subcutaneous fluids are given by placing a needle under the skin and injecting into the space between the skin and the muscle. As with most subcutaneous injections, subcutaneous fluids are given between the shoulder blades because this is one of the most distensible areas on the body. Subcutaneous fluids for kittens are dosed at **1 mL per 30 g of body weight**.

To give subcutaneous fluids, you must first assemble your supplies. You will need a fluid bag, a thermometer sticker, a 12 or 35 mL syringe with a luer lock (aka screw-in collar), an 18 g needle, and a fresh butterfly catheter. A butterfly catheter consists of a hollow needle with a plastic wing on both sites and a long piece of tubing attached to the back.

Plan to give your fluids in a location where you can place the kitten on a soft, firm surface while scruffing them with one hand to hold them in place. Kittens do not like to receive subcutaneous fluids, so the kitten may yell during fluid administration. Because of this, you must choose a location **OUTSIDE** of the kitten's regular nursery room and away from their mother. **Queens can become violent if they think their babies are being threatened or injured.**

Before giving subcutaneous fluids, you must warm them. Failing to warm the fluids makes administering them more uncomfortable for the kitten and may cause the kitten to become chilled, which is life threatening. First, if the bag is new you will have to rip open the plastic pouch to remove it. Next, remove the backing from the thermometer sticker and attach it to the outside of the bag. Place the fluid bag sticker-side-down in a microwave and heat it on High for approximately 11 seconds per 100 mL of fluid in the bag, keeping in mind that microwave ovens vary. Shake the bag half way through heating and again when finished to eliminate hot spots.

After heating, let the bag rest for about 10 seconds, then check the temperature sticker. The brightest part of the sticker should be highlighting the 100 degree mark. If the bag is too cool, continue heating it 10 seconds at a time until you reach the desired temperature. If you overheat the fluids, set the bag on a counter to cool for a few minutes, shake it, let it rest for 10 seconds, then check the temperature again. Do not proceed until the correct temperature is reached.

Remove the plastic tab from the end of one of the necks of the fluid bag to reveal the rubber stopper. Next, twist the clear end off of the 18 g needle and screw that end of the needle onto the neck of the syringe. Remove the cap from the needle tip, insert the needle into the rubber stopper, and hold the bag upright, jostling it to move any bubbles from the necks to the top. Pull back on the plunger of the syringe to draw up the appropriate amount of fluids, and if any bubbles enter the syringe, push them back into the bag. After the fluids are drawn up, pull the needle out of the stopper (the bag should self-seal,) recap the needle (**DON'T STAB YOURSELF,**) and set the bag and needle aside for later use. Screw the butterfly catheter onto the syringe, and press the plunger to run fluid through to the end of the needle.

At this point, you should check the temperature of the fluid against your skin. Depress the plunger to drip a small bead of fluid onto the inner surface of your wrist. The fluid should feel warm but not hot. If it stings on contact the fluid is too warm to give to the kitten. Pull all the fluid from the butterfly needle back into the syringe, allow the syringe to sit on a cool counter for 30-60 seconds, and try again. Repeat until the fluid feels warm on contact but does not sting.

Bring the kitten to the place you've prepared and set them in a standing position. Remove the clear cap from the butterfly catheter needle and hold it in your dominant hand. Scruff the kitten and gently lift up the skin between their shoulder blades using your non-dominant hand. This should create a "tent" of skin with a flattened vertical surface toward the back of the body.

Look at the needle to make sure that the bevel (hole) in the end is facing up. Then insert the needle into the skin using firm pressure and keeping it parallel with the body. If the needle stops abruptly after you've entered the skin but before you reach the hub (place where the needle joins the wings) you've probably hit muscle or bone. Pull back a little and aim the needle slightly upward. If you stab yourself you've aimed too high. Switch to a clean butterfly catheter and try again. The needle is correctly placed if it is inserted all the way to the hub and the tip can be easily moved under the skin.

Relax the tent of skin, but keep the kitten scruffed. If possible, try to rest one or two fingers on the wings of the catheter to keep the needle in place. Use your dominant hand to depress the plunger on the syringe and begin administering fluids.

At this point, most kittens will try to run, twist, kick, etcetera to try to get away from the new, strange sensation that you are creating. Some kittens will relax with time, some will respond positively to being lifted by their scruff, and some will do best with a helper to hold their legs if available. Do your best, but if you and the kitten cannot accomplish fluid therapy without undue stress, notify the Veterinary Services department.

Push the fluids in over the course of 1-2 minutes to allow the tissues in the subcutaneous space time to stretch. If the kitten dislodges the needle, if the skin overlying the fluids becomes too tight, or if the needle has gone through the skin and sprays outside the kitten, you can remove and replace the same needle up to 4 times. After the 4th attempt, switch to a fresh, sharper needle.

When you are finished giving the fluids, pinch the skin around the needle entry point with moderate pressure and draw the needle straight out. Continue pinching the skin for 30-60 seconds to help the hole close and prevent fluid from leaking out. Fluid may still leak out, and it may be blood tinged if a blood vessel in the skin was punctured, but the flow should naturally slow with time.

Praise the kitten for their cooperation and place them back in their nursery. Recheck their attitude and hydration status in 30 minutes. The kitten may be seen scratching at the pocket of fluid. This is normal and should be less likely if the fluids are warmed appropriately beforehand.

Also, some fluid may remain under the skin for several hours after administration, and during that time it may shift to the shoulder, triceps or arm pit. This is also normal.

Clean up your supplies so they are ready to use next time. Place the used butterfly catheter in a sharps container, hard plastic container, or in a bag to return to Feline Rescue for disposal. Take the 18 g needle and reattach it to the fluid syringe- kept together these two items should remain adequately sterile for future use. Use a permanent marker to label the fluids with the date you first punctured the stopper, and store all the items in a place that helps rubber stopper on the bag stay clean. Discard the fluid bag 14 days after its first use.

Please notify Veterinary Services if you have to give a subcutaneous fluid treatment. If the kitten was **moderately dehydrated** but seems to return to normal after treatment, monitor their hydration status, appetite, activity levels, and eliminations (urination, defecation) closely for the next 3-4 days. Fluid treatment can be repeated every 12 hours if necessary. If the kitten's condition worsens, notify Veterinary Services and take them to an emergency clinic if necessary.

If a kitten is **severely dehydrated**, administer subcutaneous as directed, but then IMMEDIATELY transport the kitten to an emergency clinic. The fluid therapy will help to begin to revive the kitten during the trip, but they are likely to need intravenous fluid therapy, intensive monitoring, and other ongoing care. Transport the kitten in a carrier with an ambient heat source such as a covered Snuggle Safe.

Wound Care

Sometimes, in the course of exploring its environments, interacting with other animals, or even receiving care, a kitten can be injured. While kittens can be quite resilient, they can also appear less injured than they are because swelling or bleeding may not be obvious, and kittens will tolerate surprising amounts of pain without crying. Signs that a kitten is injured include withdrawing from the rest of the litter or its caregivers, acting sleepy or withdrawn, reluctance to move or walking with a limp, sitting or standing abnormally, reluctance to eat, poor appetite, swelling of any limb, painful swelling of the belly, or finding blood- fresh or dried- in their fur.

If a kitten has a wound smaller than 1 cm that is slowly or not bleeding—and it appears otherwise normal—it may be a candidate for in-home wound care. Gently wash the wound with soapy water, rinse it thoroughly and dry the fur around it. If it bleeds, compress the wound with a clean cloth using medium pressure for up to 1 minute. If the bleeding stops, put the kitten back with its littermates. Keep an eye on the kitten throughout the next few days to make that the wound isn't continuing to bleed, swelling, turning red, or becoming more painful.

If the injury doesn't stop bleeding, if the kitten is too painful for you to try in-home care, or if the kitten has any of the other symptoms of an injury, they will need to be examined by a veterinarian. Also, if you are unsure if your kitten is injured, contact Veterinary Services and email pictures or video illustrating your concerns if possible.

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