

# Guide to Raising Underage Kittens

This guidebook is designed to provide a lot of information on the care of underage kittens and is applicable to foster parents, rescue groups, and animal sheltering facilities. We have broken it into small sections for you to read through. There is a large section on Kitten Nurseries for anyone ready to take that big leap.



This guidebook is part of a resource library maintained jointly by the Shelter Medicine Programs at the University of Wisconsin and UC Davis. The latest version of this document and all other shared resources can be found at their respective websites.

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## Intake Diversion Programs



During kitten season, many well-meaning members of the public swoop in to “save” litters of kittens that they see and then bring them to over-crowded shelters that do not have the capacity to provide 24 hour care because they think it is the right thing to do. Prior to kitten season, let the public know when they should and should not intervene with kittens that they find. You can provide information on your website and to the media through a press release. Encourage members of the public to wait and watch for mom before picking up any stray kittens. Mom may just be away briefly but she will not come back if they stay near the kittens and they should monitor from afar. If mom does not come back or if they know she has been hit by a car, then it is appropriate to intervene. However, they should be prepared to see their good deed through and not immediately take them to a shelter that is not prepared to care for them. Taking in animals that are not best served by coming into the shelter is a practice that animal shelters across the country must get away from. Consider managed admission of kittens (along with all other animals) and try to recruit “foster finders.” Try to partner with other organizations and rescue groups in your area to create a network for underage kittens. *For more information, refer to Developing Intake and Adoption Decision Making Criteria.*

### Foster Finders

One pool of future foster parents are the people who find orphaned kittens and bring them to the shelter. By their actions, these people show they care about the lives of these kittens and may be willing to keep them in their homes but are often unsure they can provide the necessary care.

When a shelter provides these people (labeled “foster finders”) the means and knowledge to care for kittens through a training program, foster care programs start growing. The training for potential fosters should include an easy-to-follow kitten care guide, foster coordinator contact information, and a kit containing the items needed to set up a little nursery at their home. A kit should contain a kitten nursing kit, syringes for syringe feeding, kitten milk replacer, canned kitten food, a small litter box, kitten-appropriate litter (no clumping litter), a small double diner dish and a kitten care guide. If finances allow, include a heating source like a *Snuggle Safe* disk and a small kitchen scale for daily weighing. If you can’t include a heat source or a small scale, then encourage foster parents to acquire these. These foster finders also need to know what the shelter will provide, such as medical care, food and litter, and that the shelter takes the kittens when ready for adoption unless the foster parents find adopters on their own.

## Home Nursery Kit Contents



- Nursing kit
- Syringes
- Kitten Care Guide
- Kitten milk replacer
- Canned kitten food
- Small litter box
- Non-clumping litter
- Small double diner
- Heat source (e.g. *Snuggle Safe* disk)
- Digital kitchen scale
- Foster Coordinator Contact Information

# Caring for Kittens from Birth to Eight Weeks

## 5 Requirements for Kitten Care:

1. Keep kittens warm.
2. Provide kittens with adequate nutrition.
3. Keep kittens clean.
4. Provide socialization with people and with cagemates.
5. Do your best to protect them from infectious disease.

## Body Warmth

Since kittens under four weeks of age do not have the ability to thermoregulate, we must help them maintain body warmth. One method is to place a warmed *Snuggle Safe* disk at the opening of the cage or crate. This disk then provides the needed warmth for 8 hours. Instructions for how long to heat the *Snuggle Safe* disk depending on the wattage of the microwave are printed on each disk. If you are unsure what wattage the microwave is, heat the disk for 5 minutes, then check the temperature with your hands. Make sure it does not feel too hot before placing it in the cage or crate. Cover the heating disk with a soft folded towel or blanket so the kitten cannot directly contact the disk. If no heating disk is available, place a heating pad on the low setting under the crate or on the bottom of the cage, then place a soft folded towel or blanket between the kitten and the heating pad. Check the heat source frequently to ensure it is not too hot or too cold. Make sure some area of the cage does not contain a disk or have a heating pad under it so kittens can move away from the heat source if too hot. Kittens also like a nice nest in their cage or crate so bundle them in a nice fleece that they can crawl into and out of.

We cannot overemphasize the need for a heat source in orphaned kittens. The queen would have provided a nice 100 - 103°F (38 – 39°C) environment for them. Continue to provide a heat source for orphaned kittens until four to six weeks of age. Although kittens over four weeks old may start avoiding the warmed bed, if the room is cool, even older kittens will seek out a warm spot. For this reason, as well as for socialization, consider appropriately pairing new single kittens of the same age so they

can share body heat and be less likely to experience hypothermia.

Providing a good environment for kittens, means providing a warm, non-drafty room. A good practice is to make sure a towel covers the entire bottom of the cage and a bed made from a small litterbox or food carton is available so kittens do not sleep in their litterboxes. A towel covering the crate or front of the cage prevents drafts and keeps kittens under 4 weeks of age nice and warm. Ideally, kitten rooms should be kept around 85°F or 29°C but we recognize that it isn't always practical. A kitten over 6 weeks of age only needs the availability of a warm, cozy spot.

## **Kitten Feeding**

Daily weight gain is an indication that the diet is meeting the kittens' nutritional needs. Weigh kittens at the same time daily, not only to ensure adequate weight gain but also to calculate the amount they should be eating with each feeding. Kittens should gain about ½ ounce (14 grams) per day or 4 ounces (113 grams) per week. Keep in mind that the younger the kittens are, the more accustomed they are to staying latched onto their mom's nipple all the time and nursing small amounts periodically. Frequency is essential for digestion and allows the kitten's digestive system to handle small amounts at any one time. Additionally, the act of nursing stimulates digestion. If you notice a kitten not eating enough in one feeding, increase the frequency of feedings or go back to that kitten after the others finish eating to give it another chance to take more food.

### **Guidelines for bottle feeding kittens:**

- Kittens must be warm, they cannot digest properly if their body temperature is low.
- Combine 1 part powdered KMR formula to 2 parts water. (NEVER give them cow's milk and keep them on the same formula.)
- Kittens should eat 2 tablespoons or 30 ccs of formula per 4 ounces of body weight within a 24 hour period.
- Feed kittens less than 2 weeks of age at least every 2 hours.
- Kittens 2 to 4 weeks of age should eat every 3-4 hours. If they are sleeping for longer periods during the night, do not wake them to feed.
- Feed weak kittens or ones not eating enough more frequently.
- Some individual variations in frequency and amounts for each kitten

may occur.

[Click here](#) for a video from Maddie's Institute on Orphaned Kitten Care and bottle feeding

## General Feeding Guidelines

Test the temperature of the formula before feeding, it should be warm (around 100°F or 38°C), but not hot. Warm the bottle by placing it in hot water for a few minutes or by putting it in the microwave until it reaches the correct temperature. If you use the microwave be sure to mix the formula well before testing because hot spots may develop in the heating process.

Always properly position a kitten for feeding. **NEVER** recline a kitten on its back while feeding. This can cause it to aspirate, which means the kitten inhales the formula into their respiratory tract rather than swallowing. Aspiration can lead to a reactive pneumonia and be fatal. Kittens must be leaning forward or flat on their belly while feeding. They are most comfortable when positioned as they would be if nursing from their mom. To achieve this position, place the kitten on its stomach on a towel or cloth so the kitten can cling to the material and knead instinctually. If the kitten is acting frantic while nursing, try wrapping the kitten in a towel while feeding it. When bottle feeding, gently open the kitten's mouth with the tip of your finger and slip in the nipple. Once the kitten learns what is coming, it will search out the nipple enthusiastically. You will feel a vacuum effect when the kitten gets into suckle mode. Watch for bubbles in the bottle during suckling and ears wiggling. These movements mean the kitten is suckling successfully. To keep air from getting into its stomach, hold the bottle at a 45-degree angle, keeping a slight pull on the bottle. Allow kittens to suck at their own pace. If a kitten refuses to take the nipple or will not suckle, try rubbing it vigorously on the forehead or stroking its back much as its mom would. Using a toothbrush to stroke the kitten can simulate the feeling that it would get from the queen's tongue. If you still cannot get it to nurse from the bottle, syringe feed the kitten to make sure it gets adequate nutrition. If a kitten requires syringe feeding, have a plan in place for who foster parents should contact.

If feeding multiple kittens, it will be easier to get them all fed the required amount if you feed each one multiple times during the session. To accomplish this, feed the first kitten until it stops nursing, then feed the

second, and so on. After each has had one turn at the bottle, go back to the first and repeat the process. Usually after two or three nursing turns, a kitten has had enough for one feeding. When a kitten has had enough formula, it will usually get some bubbles around its mouth and its abdomen will be very rounded, almost pear-shaped.

Kittens that seem too weak to nurse may be hypothermic or have an underlying medical issue. A kitten refusing to nurse beyond the first few "getting the hang of it" times may indicate illness and it needs to be examined by a veterinarian. Have a plan in place to for who foster parents should contact.

After each feeding session, give each kitten a full-body once over with a barely damp, warm washcloth. Use short strokes like its mom would use. This activity keeps the kitten's fur clean, teaches it how to groom and gives it needed socialization. Make sure the kitten is completely dry before placing it back in its cage.

Kittens naturally suckle on each other and on fingers, even after eating. Kittens suckling on each other excessively may be a sign that the frequency of feedings need increased. If littermate suckling becomes problematic, especially around the genital area, separate the kittens. Check each kitten's genitals to ensure sucking activity is not causing problems (redness, irritation, penis hanging out, etc.). Suckling on genitals can lead to the urethra swelling shut and having to be surgically reopened. If any of this occurs, have a plan in place for who foster parents should contact.

## **Weaning**

A kitten is ready for the weaning process when it bites the nipple often and forcefully, and is able to lick formula from fingers. Continue bottle feeding through the weaning process to ensure kittens get adequate nutrition and are not overly stressed. The first step of the weaning process is to get the kitten to lap up formula from your finger and then a spoon. Once it masters this skill, put formula in a flat dish. Introduce the kitten to solid food by mixing warm canned kitten food and prepared kitten formula into a thin gruel. Gradually reduce the amount of formula mixed with canned food until the kitten is eating just the food.

Place the food in a shallow dish. Some kittens begin lapping right away; others prefer to lick the gruel from your fingers. Allow them to do so and

slowly lower your finger to the dish. The kittens may bite the edge of the dish or walk in the food. Sometimes it takes two or more meals before they catch on. If a kitten does not seem interested in the gruel, try gently opening the kitten's mouth and rubbing a little of the food on its tongue or teeth. Be patient, the weaning process takes time. As the kittens catch on, thicken the gruel. When kittens are eating thicker gruel, they should always have fresh water available in a low spill-resistant bowl.

Kittens often walk through their food. Make sure the kittens are clean and **DRY** before putting them in their cages. Most weaning kittens are messy eaters so you may not be able to leave gruel or water in their cages at first. Wet kittens can rapidly lose body temperature.

[Click here](#) for a video from Maddie's Institute on weaning orphaned kittens onto solid foods.

## **Stimulation for Urination and Defecation**

Mother cats groom their kittens to stimulate urination and defecation on a regular basis. If you are acting as their foster parent, you get this important duty. Very young orphan kittens will not be able to urinate and defecate without your help, so this is a crucial part of neonatal kitten care. Before and after each feeding, gently rub the kitten on its lower abdomen, as well as the genitals and rectum with a cotton ball/pad dipped in warm water or a fragrance free baby wipe. Make sure to rub only enough to get the kitten to eliminate because overstimulation will irritate the area. Keep an eye out for chafing and lingering dirt and do not let the kitten get chilled. Kittens should (and almost always will) urinate during each stimulation. They should defecate at least once daily.

### **General guidelines are:**

- Kittens need to be stimulated until about 3 weeks of age.
- Kittens should be stimulated before and after each feeding.
- Kitten should urinate every time and defecate at least once daily.

When kittens get to be 3 – 4 weeks old, they no longer need help eliminating body wastes. Place a litter box in the crate or cage and fill with non-clumping litter or shredded newspaper. Clumping litter can create litter clumps in their stomachs and respiratory passages and should not be used with young kittens.



At the same time as introducing a litterbox, you may need to start providing some dry kitten food so the kittens can chew on the food and not the litter. When teaching a kitten to use a litterbox, placing their feces in the box so they smell it in there often helps. If you have a kitten that defecates on its towel instead of in the box, move the feces to the box instead of completely cleaning it out of the cage.

[Click here](#) for a video from Maddie's Institute on how to stimulate a kitten to urinate and defecate.

## Kitten Weight Gain and Developmental Milestones

**Kittens should gain about ½ ounce (14 grams) every day or 4 ounces (113 grams) per week.** Weigh them at the same time every day with a kitchen or small postal scale. Lack of weight gain in a 24 hour period is cause for concern. Begin syringe feeding the kitten and have a plan in place for who foster parents should contact. To syringe feed the kitten, mix up the KMR as usual and then draw it up in a syringe. Put a nipple on the end of the syringe and place the kitten in the proper feeding position. Try to get the kitten nursing by slowly pushing KMR out of the syringe and through the nipple into its mouth. Make sure it swallows the formula before you push more into its mouth.

### Kitten Developmental Milestones

Age

Weight

Milestones

Birth

3–3.7 ounces

90–100 grams

Eyes and ears are closed.

Sleep 90% of the time.

Minimal handling.

2 – 3 days

Umbilical cord falls off.

4 days

Begins to purr.

10 – 14 days

8 ounces

227 grams

Eyes and ears should be open.

Healthy kittens will be round and warm with pink skin and will rarely cry.

2 – 3 weeks

12 ounces

340 grams

Deciduous incisors erupt, can begin to eliminate without help.

Will start crawling, standing, and playing with littermates.

Begin regular handling.

Ready for deworming.

4 weeks

1 pound

454 grams

Deciduous canines erupt, beginning to walk but do not have great balance, will start to groom themselves, able to thermoregulate.

Continue daily handling.

Ready for their 1<sup>st</sup> vaccine.

Ready for gruel and may be ready for introduction of dry kitten food.

6 weeks

1.5 pounds

680 grams

Deciduous premolars erupt.

Running, playing, using the litterbox, grooming themselves.

Should be eating dry kitten food, supplemented with canned.

Ready for surgery and adoption (if you are able to place them at this age).

8 weeks

2 pounds

907 grams

Ready for surgery and adoption (if you are unable to place them at 6 to 7 weeks of age).

## **0 - 1 Week of Age**

**Feeding:** If the kittens are orphaned, they need to be bottlefed every 2 hours. If the queen is with the kittens, they should nurse vigorously and compete for nipples. Newborns can nurse up to 45 minutes at a time. Be sure to watch kittens nursing at least once a day, if the queen will permit it. Check to make sure that each kitten is settled and nursing. A great deal of activity and crying could indicate a problem with milk flow, quality or availability. When the queen reenters the box, there should be some fussing for only a few minutes before everyone has settled down to serious nursing.

**Environment:** The temperature of the nest box should be nice and warm: 85-90°F. Hypothermia is the number one danger to newborn kittens.

**Development:** At one week of age, the kittens should weigh around 4 ounces and should be handled minimally. Kittens will sleep 90% of the time and eat the other 10%.

## **1 - 2 Weeks of Age**

**Feeding:** Continue bottle feeding orphans every 2 - 3 hours until kittens are full but not bloated.

**Environment:** Floor temperature of the nest box should be nice and warm: 80-85°F.

**Development:** Kittens at 2 weeks of age will weigh around 8 ounces. Ear canals open between 5 and 8 days. Eyes will open between 8 and 14 days. They open gradually, usually starting to open from the nose outward. All kittens are born with blue eyes, and initially no pupils can be distinguished from the irises - the eyes will appear solid dark blue.

Healthy kittens will be round and warm, with pink skin. If you pinch them gently, their skin should spring back. When you pick a kitten up, it should wiggle energetically and when you put it down near the mom it should crawl back to her. Healthy kittens seldom cry.

To determine the sex of the kittens, hold a kitten on its back in your hand. In females, the vulva is a vertical slit above the anus; they are very close together. In males, the penile opening is above the anus, but they are separated by a raised scrotal sac and thus seem far apart. It is easiest to see the differences between the sexes if you examine all the kittens and compare the differences.

## **2 - 3 Weeks of Age**

**Feeding:** Continue bottle feeding orphans every 2 - 3 hours until kittens are full but not bloated.

**Environment:** Floor temperature of the nest box should be nice and warm: 75-80°F.

**Development:** If there is a queen, she will begin to spend larger periods of time out of the nest, though she will not go far from it. Kittens will weigh around 10 - 12 ounces. Their ears will become erect. Kittens begin to crawl around day 18 and can stand by day 21. Kittens will begin to play

with each other, biting ears, tails, and paws, even before their teeth have come in. Kittens learn to sit and touch objects with their paws.

Kittens begin their socialization phase - they will be strongly influenced by the behavior of their mother for the next six weeks. To further socialize kittens, increase the amount of handling, and get them accustomed to human contact. It is important not to expose them to anything frightening; children may seem intimidating and should be supervised closely while visiting to ensure gentle handling.

### **3 - 4 Weeks of Age**

**Feeding:** Continue bottle feeding orphaned kittens every 3 – 4 hours and begin the weaning process. At this stage kittens may start lapping from a bowl.

**Environment:** Floor temperature of the nest box should be 70 – 75°F from this point onward.

**Development:** Kittens will weigh around 13 to 16 ounces. Adult eye color will begin to appear, but may not reach final shade for another 9 to 12 weeks. Kittens begin to see well and their eyes begin to look and function like adult cats' eyes. Kittens will start cleaning themselves, though their mother will continue to do most of the serious cleaning.

### **4 - 5 Weeks of Age**

**Feeding:** They can usually drink and eat gruel from a shallow dish by 4 weeks. Weaning should be done gradually and bottle feeding should be continued every 4 hours while they are learning to eat solid foods. Introduce dry food and water.

**Development:** Begin litter training at four weeks. Use a low box with one inch of non-clumping litter or shredded newspaper. Do not expose the kittens to the clumping variety of litter, as it is harmful if ingested. After each feeding, place the kitten in the box, take his paw, and gently scratch the litter. Be patient! The kitten may not remember to do this every time, or may forget where to find the litter box, but will learn quickly. Be sure to give the kittens lots of praise when they first start using their boxes. Most will use it from the start, but like other babies, might make an occasional mistake. It is a good idea to confine the kittens to a relatively small space, because the larger the area the kittens have to play in, the more likely

they will forget where the litter box is. Keep the litter box clean and away from their food.

## **5 - 6 Weeks of Age**

**Feeding:** Feed gruel 4 times a day and thicken the gruel gradually. Dry food and water should be available at all times. If you are fostering a litter with their mother, continue weaning. Some kittens will not like canned food. For reluctant eaters, try mixing any meat-flavored human baby food with a little water. The meat flavor is often more appealing to the picky eaters. Be sure the brand you get does not contain onion powder as this ingredient can be hazardous to kittens.

**Development:** At about five weeks, kittens can start to roam around the room, under supervision. They will weigh 1 pound and the testicles of male kittens will become visible. The strongest, most curious kitten will figure out how to get out of the nest. The others will quickly follow.

**Play with your kittens daily!** It is a good idea to wear long sleeves and pants, as they can play roughly and their claws are sharp. If you sit on the floor they will play "King of the Mountain," using your knees and shoulders as vantage points. This game is lots of fun and good exercise for them. Some kittens may be fearful at first; do not force yourself upon them. You can get them used to your presence by sitting in the middle of the room making phone calls; this way they hear your voice but do not feel threatened. Make them an important part of your household activities; accustom them to the sounds of the TV, vacuum cleaner, and other household sounds.

## **6 - 7 Weeks of Age**

**Feeding:** Kittens should be eating canned and dry food well. Feed the kittens at least three meals daily. If one kitten appears food-possessive, use a second dish and leave plenty of food out so that everyone is eating. Bear in mind that a kitten at this age has a stomach roughly the size of an acorn, so, although they may not eat much at a single sitting, they like to eat at frequent intervals throughout the day.

**Development:** By this time, you have "mini-cats." They will wash themselves, use scratching posts, play games with each other, their toys, and you, and many will come when you call them. Be sure to reintroduce them to their litter box after meals, during play sessions, and after naps.

These are the usual times that kittens need to use the litter box.

**Adoption:** It is safe for healthy, robust 6 week old kittens to be spayed/neutered and made available for adoption if you are able to place them at that age in your community. Check your state and local animal ordinances to find out if this is possible for your facility.

## 7 - 8 Weeks of Age

**Feeding:** Offer wet food 2-3 times a day (each kitten will be eating a little over one can of food per day). Leave down a bowl of dry kibble and water for them to eat and drink at will. If you have a litter with a mom cat, she should only be allowing brief nursing sessions, if any.

**Development:** By the end of the 8th week, kittens should weigh 2 pounds each and are now miniature cats.

**Adoption:** It is time for their spay/neuter surgery and adoption!

## Socialization and Bathing

Beginning around 3 weeks of age, kittens need exercise to promote muscular and circulatory development and to learn social skills. They will begin to play with their littermates and learning from their mom if they are not orphaned. It is good to begin regular daily handling of kittens to get them used to contact with people. Play is the best method to help them physically and socially develop.

If kittens are orphaned and do not have a mom to regularly groom them, it is important to teach them to groom and keep them clean. After each feeding session, give kittens a full-body once over with a barely damp washcloth. Use short strokes like a queen would use. Kittens often get dirty between cleanings and it is okay to wash a kitten with warm water under a sink faucet but focus only on the areas needing cleaned. A simple "butt bath" will usually do the trick. After bathing, wrap the kitten in towels/blankets and a heating pad set on low. Your body heat is not sufficient to warm up a cold kitten. Make sure you do not leave a kitten until it is completely dry.

## Socialization

- It's a hard job, but someone has to play with kittens to ensure they

are well socialized and people friendly by adoption time.

- Kittens will naturally socialize with their mom and littermates if they have them. Socialization is another reason to pair single, same-age kittens on intake.
- The key socialization period in kittens is 4 to 12 weeks of age.
- Kittens start to play and explore at about 4 weeks of age<sup>1</sup>. Make sure they have toys and stimulation in their cage. Pipe cleaners, cardboard rolls from toilet paper and paper towels are great play items in addition to traditional kitten toys.
- In a foster home, the foster parent should spend some time each day sitting in the foster room with the kittens and having play time. In a kitten nursery, make sure the kittens get some hands on in-cage socialization time with nursery caregivers.
- Introducing new fosters to the foster parents' resident pets during the first two weeks is not recommended. Let the kittens get acquainted with their new home before exposing them to other animals. After this time, introducing foster kittens to adult cats and dogs in the home can be great for the socialization of the kittens but should definitely be done with care and only under supervision.

## **Steps to Bathe an Underage Kitten**

1. Get a small sink or a basin ready with some warm water. If the kitten is really dirty, a small amount of Dawn or baby shampoo can be used in the water. Make the water a nice warm temperature like you were taking a bath.
2. To keep the kitten from getting chilled, have towels ready to immediately dry it off. If possible, warm the towels in the dryer beforehand.
3. You may want to wear long sleeves and gloves. Kittens may panic and start to scratch. Gently hold the kitten by the scruff and support its body with your other hand. This may help calm and control the kitten.
4. Give the kitten a quick but thorough bath to get any food and feces off them. If only its butt is dirty, then only immerse the butt, not the whole kitten.
5. Rinse the kitten off with warm water and immediately wrap it in a towel.
6. Rub vigorously to get the kitten dry. If the first towel becomes wet, switch to a clean, dry towel.
7. Keep the kitten with you and do not put it back until completely dry.



If needed, wrap a heating pad around the outside of the towel while the kitten is drying.

[Click here](#) for a video from Maddie's Institute on bathing orphaned kittens.

## Care of the Queen

If you are fostering a pregnant queen during her final week of pregnancy, it is important to remember she may not have a big appetite because the kittens are crowding her internal organs. Feed her several small meals daily, rather than one or two larger meals. Leave dry kitten food and water out at all times. It is virtually impossible to overfeed a nursing or pregnant queen. Food requirements increase up to three times the normal amount.

Prepare a kitting box. Place it in a dry, warm, relatively dark and out-of-the-way place, and put the queen in it. If she doesn't want to stay in it, don't insist, but you can encourage her by petting her and giving her little food treats. If your nursery room is not that warm, you can keep the box warmer by wrapping a heating pad in a towel, setting it on "low," and placing it under HALF of the box so that the queen and kittens can remove themselves from the heat source if they choose. One word of warning: you might consider wrapping duct tape or a cord protector around the cord, as the kittens tend to chew on it! Alternatively, consider using a *Snuggle Safe* Disk which does not require a cord. Until the queen delivers, fill her litter box with shredded newspaper instead of cat litter. Many cats will deliver their kittens in the litter box. Newspaper provides a much cleaner environment for the cat and kittens than litter. After the kittens are born, you can switch to your normal non-clumping litter.

## The Birth of Kittens, or Kitting

The majority of cats give birth with no problem or need for outside help. Before delivery, the queen may become irritable and restless. She will search for a place to have her kittens. Put her in the designated kitting box. She may choose not to have them there, so it helps to keep the box in a room with as few nooks and hiding places as possible. If she has her kittens outside of the kitting box, let her. When she is completely done with the delivery, move them all into the box. If the cat has had her kittens outside the box, don't worry about the "mess" - when she is finished she will normally clean up and leave very little evidence of the birth.

Some cats may want you to stay with them, and will try to follow you if you leave. You will probably have to spend some time with this kind of cat soothing her. Often after the birth of the first couple of kittens, she will be very busy and not so dependent on your presence. Other queens will try to get away from you and hide. Give her the space she needs, but keep checking in on her regularly. It is quite possible that you will miss the birth process entirely. You might wake up one morning or come home from work to find the new family born, dry, and nursing.

## **Stages of Feline Labor**

The first stage may take 12 hours, during which the queen may purr and breathe rhythmically. She may become very active, try to dig at the floor, appear to be straining to use her litter box, and cry loudly.

In the second stage, the water breaks, and straw colored fluid is passed. A kitten will be delivered a few minutes later. The queen will lick the kitten clean and bite through the umbilical cord. She is bonding with her kittens through this process, and learning to recognize them as her own. Do not disturb her. It may look as if her treatment is too rough, but she is actually stimulating breathing and blood circulation. Kittens should begin nursing between subsequent births.

In the final stage, the placenta follows a few minutes after delivery of a kitten. The mother will probably eat some or all of the placentas. Kittens are born anywhere from 15 to 30 minutes apart, so most deliveries take 2 to 6 hours. The average litter is 4 to 5 kittens. Larger litters of 6, 7, or more are unusual.

If a kitten is not born within 2 hours and the mother appears to be continually straining or in distress, call a veterinarian immediately. She may need a Caesarean or a drug called oxytocin to stimulate contractions. If the mother is content and happy, she is probably finished, though there have been cases in which a cat resumed delivery sometime later.

## **Nursing Queens**

If you are lucky enough to have a mom taking care of her kittens, your job is much easier. You need to make sure that mom is getting plenty of food because nursing a litter of kittens requires a lot of calories. The queen should be eating dry kitten food supplemented with canned food and she

can eat as much as she wants. You also need to monitor her mammary glands as mastitis (or inflammation of the mammary glands) is a common problem. Her mammary glands should not be overly swollen or hard, should not look red or inflamed, should not be painful to the touch, and you should be able to express milk out of them. One way to monitor the queen's lactation is by monitoring the kittens. They should not be overly vocal, should sleep most of the time, and should have a nice, round belly. There should be a plan for who foster parents should contact if they have any concerns with the queen or kittens they are fostering.

## **Considerations for Mixing Cats and Kittens**

Shelter staff and foster parents are tasked with caring for and adopting out animals who are healthy and well-socialized pets for their future adoptive homes. We want growing animals to be able to experience the world and we want adult animals to be able to express their normal behaviors and have interactions that would enrich their lives. It is important to balance these mental/emotional needs with medical health needs, including preventing the spread of infectious disease. Kittens, in particular, are highly susceptible to infectious disease and special consideration must be given to when it is or is not reasonable to mix them together; in addition, there are some important details to keep in mind when mixing unrelated cats of any age.

Limitations on capacity - staff, time, and/or number of foster homes or amount of cage space - can pose challenges to providing the care necessary to move animals efficiently and safely to the point of adoption. These challenges may lead some shelters to make a choice to mix unrelated cats or kittens together just in order to find more "space." However, that choice often leads to more challenges rather than fewer if the choices of which cats to mix are not balanced against the ability to screen for and recognize signs of infectious disease.

### **All Cats and Kittens**

**Does the shelter have adequate screening and monitoring practices in place to identify animals with signs of infectious disease?**

**Cats showing signs of infectious disease should not be co-mingled or housed in groups. Signs to watch for include:**

- Sneezing, nasal discharge, squinting/swollen eyes, ocular discharge
- Vomiting, diarrhea, poor appetite
- Itchy skin (pruritis), visible external parasites, suspicious areas of hair loss, Wood's positive skin lesions
- Unexplained weight loss, history of littermate with sudden death

Screening for these signs must begin at intake and monitoring should continue daily for the duration of the animal's time in the shelter.

**Infectious disease may be brewing in apparently healthy cats.** The time between being infected with a pathogen and showing signs of illness is called the incubation period. During the incubation period an animal may be contagious to other animals but appear healthy. The incubation period for panleukopenia is well established, typically 5-7 days but can go up to 14 days. A cat is unlikely to be incubating panleukopenia if they appear healthy for 7 days, and the chances are slim if no signs have been seen for the past 14 days. For this reason, cats who have at least 7 days (and ideally 14 days) of a well-documented, healthy medical history in the shelter make better choices than cats with an unclear history.

Additionally, the incubation period for ringworm is 2-4 weeks. If cats are being screened for suspicious lesions (as well as other signs of infectious disease) at intake, receiving a wood's lamp examination at intake, and are checked again prior to being mixed, this will help to limit the spread of ringworm between cats in your shelter.

**Does the shelter routinely vaccinate all cats and kittens at time of intake (or as soon as they reach 4 weeks of age) and every 2 weeks thereafter?**

Vaccination is a key component of preventing disease outbreaks. The panleukopenia component of the FVRCP vaccine in particular offers robust protection from disease, but it does take at least 5 days for the vaccine to provide full immunity. Furthermore, the presence of maternal antibodies may prevent a vaccine from successfully immunizing a kitten, so it is important that they get re-vaccinated every 2 weeks while they are in the care of the shelter or until they reach the age of 20 weeks.

## **Kittens < 20 weeks old**

The benefits may be worth the risks for mixing unrelated kittens together when combining pairs of single orphaned kittens who risk missing out on critical opportunities for socialization with other cats. In other cases, the risks of combining kittens probably outweigh the benefits. While shelters may choose to mix kittens together for other reasons, this often poses significant risk for welfare and health for other individuals and possibly for the population as well.

**There are several factors that should be weighed before mixing animals from different sources together in any situation:**

**Do not mix sick kittens with other (healthy or sick) kittens.** Much like children in daycare, if one kitten is sick, chances are all of them are going to get sick. But in kittens the stakes are higher, because the illness could be life threatening. Kitten's immune systems are developing from the day they are born but it takes time to develop a robust immune system. Furthermore, because kittens may have received antibodies from their mother soon after birth (that are important but can interfere with immunization), they may not be immunized by the vaccines they receive until the levels of maternal antibodies fall below a certain threshold. Because we can never be certain when that threshold is, kittens must be vaccinated every 2 – 3 weeks until 20 weeks of age when all maternal antibodies are known to have subsided. Also, even though 2 unrelated kittens may have signs of upper respiratory disease, you cannot be certain the disease is being caused by the same pathogen so mixing them together may result in complicating their upper respiratory infections.

**Considerations when using surrogate queens:**

Putting orphan kittens with an unknown history with a queen with older kittens may be a very risky choice for all of the kittens. Even if apparently healthy, the new kittens may be incubating disease that could affect the queen or other kittens she is nursing. Older kittens often also outcompete orphans for the milk they need to grow and thrive.

Queens provide more than just food and a warm snuggly pillow to their kittens. Kittens receive colostrum from their mothers in their first nursing sessions after birth. Colostrum serves to offer some immune protection

from infectious disease until kittens develop an immune system of their own. Unfortunately, kittens are only able to absorb colostrum for the first 24 hours of their life, and queens only produce it soon after queening. Kittens who miss out on receiving colostrum are at high risk for disease and fading kitten syndrome. The colostrum-deprived orphans have a poor prognosis, and if/when they become ill they may put the queen's original kittens at risk.

**NOTE:** *Kittens do not receive any immune benefits through nursing after the first 24 hours of life. Vaccinating a queen provides no immunity to her nursing kittens. Kittens who are 4 weeks or older should each receive their own vaccinations (or start once they reach 4 weeks of age), repeating as described above.*

In addition, overloading a queen with more than her litter or with sequential litters may cause health and welfare risks for the queen. The nutritional needs of nursing queens are high, and caring for orphan kittens will take a toll on her physical health unless nutritional needs are maintained. Furthermore, it is important to maintain consideration for the behavioral needs of the queen over time.

**Imagine the worst case scenario when making a choice to mix kittens and weigh that against your goals for socialization and/or foster home placement. If you decide to mix 2 unrelated litters of kittens, imagine the consequences if a serious disease were to spread to all individuals:**

What if you placed 1 orphan baby with a nursing queen and her 4 kittens? If either group is harboring disease, all 5 of these kittens (and possibly the queen) are now at risk. The benefits of putting the orphaned kitten in this group to save his life may ultimately jeopardize 5 other lives.

What if you placed 2 single orphaned kittens together? In this scenario, even if the worst happens, only these 2 kittens are put at risk for disease. As singletons, these kittens have a relatively high risk of developing behavioral problems that can reduce their adoptability. The choice to combine them carries some disease risks, but also offers real socialization benefits. The risks of 2 kittens remaining alone versus living together does not multiply the risk additional animals.

# Kitten Nurseries

With the arrival of each and every spring, the staff of shelters across the county know they will soon face the overwhelming influx of underage, often orphaned, kittens. In the past, euthanasia of these kittens often seemed the only viable and humane choice even at facilities with a robust foster program. It takes resources and time to raise kittens to adoption age, two items in short supply at our largely underfunded, understaffed shelters. But as more shelters increase their life saving ability, creative programs aimed at increasing live release rates are emerging. One such new and innovative program is the development of kitten nurseries. A kitten nursery saves lives, but it takes planning, funding, good protocols, and a network of dedicated staff and volunteers to succeed.<sup>5</sup>

Creating a successful kitten nursery takes commitment and resources from the shelter, local affiliates and the community. Protocols governing the care of the kittens, the cleanliness of the nursery, and methods of controlling infectious diseases are other critical elements.

## **Developing a kitten nursery requires:<sup>5</sup>**

- Planning
- Setting up the Nursery
- Creating an Extensive Foster Care Program
- Controlling the Spread of Infectious Disease
- Caring for Kittens from Birth to Eight Weeks
- Medical Care and Protocol Development
- Training Staff and Volunteers
- Supersizing the Adoption Program

## **Planning**

Before moving forward with establishing a nursery program, many questions must be examined and answered. Shelter and other organization leaders associated with animal care must decide how great the need for a nursery is and how well it will serve the community. For communities where large numbers of kittens are euthanized annually and the sheltering agencies are looking for solutions, a kitten nursery may be the right solution.

The availability of physical space is one of the first requirements to determine. A separate building is ideal. The primary reason in keeping the facility separate is to control the spread of infectious diseases within such a vulnerable population. A secondary reason is the ability to allow volunteer staff to enter and leave the nursery without having access to the main shelter building. If a separate location is not an option, the ability to isolate the nursery from the main shelter is necessary. The chosen location and size will also affect the number of kittens housed, staff required, daily routines and medical protocols.

Staffing the nursery will, most likely, involve a combination of permanent and part-time personnel, seasonal help, and volunteers. At least one permanent, full time staff member should be assigned to the nursery. Will there be funding for additional staff or additional hours for part-time personnel during kitten season? This type of program generally relies heavily upon volunteer participation. Are reliable volunteers available? If relying heavily on volunteers, it is essential that at least one staff member is present at all times to ensure facility consistency, adherence to procedures, and to relay important information.

Few shelters have the resources to run an around-the-clock kitten nursery, therefore do not underestimate how essential a strong foster care program is. Are enough foster homes available to care for the orphaned, unweaned kittens and kittens not thriving in the nursery?

What community partnerships will enhance and increase resources? Look to local rescue groups and city or county organizations. Community partnerships can help in establishing the nursery and may provide joint staff and volunteers, an increased pool of fosters and adopters, assistance and participation with funding, and larger adoption events.

How will the nursery be funded? Are grants available? The initial cost of setting up the nursery may be significant. Fundraising efforts, such as a “kitten shower” can help offset those expenses and spread the word about the nursery.

## **Setting up the Nursery**

Nursery design must protect the kittens against the spread of infectious disease, provide for their physical needs, and allow them proper social development. Some nurseries may keep kittens from birth to eight weeks



of age; others only kittens four weeks and above. Foster care is used for nurseries without the capability to house unweaned, orphaned kittens as well as kittens not thriving at the nursery.

To help with management of the nursery, each room should be color coded and fully equipped. For example, one room may be identified as the blue room, one the green room and so on. Each of the rooms as well as the non-housing areas, such as the work spaces, laundry space, and storage space, should be color coordinated. Color code any items that can be moved with spray paint or duct tape, such as the signs on the doors, food containers, litter container, watering can, trash can, laundry basket, broom and dustpan, mop, disinfectant spray bottles, and so on. Color coordinating is a way to help control the spread of infectious disease by giving staff and volunteers a visual way to make sure that everything that belongs in a room stays in that room. This is especially important for cleaning items such as brooms, mops, dustpans and spray bottles or anything that could serve as fomites from one room to another. Color coordinating is also useful for items belonging in areas that do not house kittens. This will identify them as “clean” areas. Staff and volunteers will need training on why everything staying within the assigned room is so important. They must understand this method reduces the spread of diseases and also ensures efficient daily operation since no one must go looking for a misplaced essential item. If an item does get carried into another room, staff will be able to quickly see it does not belong.

Specific shelter and community environments often determine how a nursery should be arranged to provide the best kitten care. For example, are highly contagious infectious diseases, particularly panleukopenia, extremely common in the area or are they a rare occurrence? Do a lot of kittens come in with confirmed dermatophytosis? In shelters where panleukopenia and dermatophytosis are common, including procedures to minimize the spread of infectious diseases should be a primary factor in nursery design. Where infectious diseases are common, grouping kittens as cohorts based on intake may be the best arrangement because housing kittens in a single room for their entire time at the nursery minimizes the potential for a panleukopenia outbreak even if a case or two occurs within the room. This method keeps the infectious disease confined to one room/intake week group. Procedures must then include plans for treating mild illnesses such as diarrhea, upper respiratory infection, and conjunctivitis in the room without pulling the kittens out. In

addition, grouping kittens by intake week provides the means to control the number of intakes each week based on space availability, thus keeping staff and volunteers from becoming overwhelmed.

For shelters in communities where infectious diseases like panleukopenia and dermatophytosis are a rare occurrence, nursery design may be based on age. The dominating factor governing the arrangement of these rooms can be meeting the physical and social needs of the different age groups, such as nursing moms with litters, orphaned, unweaned kittens from 0 – 4 weeks of age, and the 4 – 8 week old kittens just transitioning to solid foods who need more play and socialization time.

Shelters considering a neonatal nursery must take into account the expense of a 24 hour, seven-days-a-week operation. Orphaned, unweaned kittens are a fragile population requiring round the clock care, frequent rechecks, more supervision, and are more susceptible to illness. Caring for them requires a staff of employees and volunteers assigned to strictly work with this age group and who are trained in the care of neonates.

## **Medical Protocols**

Juvenile animals are the most vulnerable to infectious disease because of their immature immune systems and maternal antibody interference. No matter how many vaccinations a kitten receives, it is still not necessarily protected from disease until around 16 to 20 weeks of age, so vaccine boosters must be continued until that time.

Medical protocols should be developed by or with the help of an experienced shelter veterinarian. Protocols may vary based on the geographical location of the shelter, infectious diseases prevalent in that area, and the ability of the shelter to isolate and treat highly contagious diseases like panleukopenia and dermatophytosis. It is imperative that any kittens with either of these conditions be immediately removed. For shelters with an isolation room and the capability to provide adequate medical treatment, the kittens must be immediately moved to the isolation area. For shelters without the capabilities to isolate and treat animals infected with panleukopenia or dermatophytosis, euthanasia of affected kittens is likely the only option. There are many other common illnesses and conditions seen in kittens which will need to be addressed and have a protocol in place that outlines clinical signs, diagnosis, isolation, treatment, and resolution. *For more information on protocol development,*

refer to [Developing infectious disease policies and protocols in an animal shelter.](#)

## **Intake Protocols**

Intake protocols should be defined for your facility with the help of an experienced shelter veterinarian. All kittens under four weeks of age should receive routine deworming with the antiparasitic pyrantel pamoate and the antiprotozoal ponazuril upon intake. If fleas are present, kittens need a quick bath with warm soapy water, taking care to prevent hypothermia. *For more information, refer to Steps to Bathe an Underage Kitten in Chapter 2.* Fleas should then be manually removed.<sup>2</sup> Intake staff can be trained to estimate the age of incoming kittens based on the general guideline that they gain an average of 4 ounces (113 grams) each week. All kittens four weeks of age or older and weighing at least 1 pound (454 grams) should receive routine deworming with pyrantel pamoate and ponazuril, and an initial vaccination with a modified live vaccine containing Feline panleukopenia virus (FPV), Feline Herpesvirus-1 (FHV-1), and Feline Calicivirus (FCV).<sup>3</sup> They can also receive a routine flea preventative like selamectin dosed for weight.<sup>2</sup> Some shelters may consider giving nitenpyram if fleas are visible and the kitten meets minimum weight requirements. Praziquantel may also be administered assuming the kitten has tapeworms. Shelters should screen for feline retroviruses before pairing unrelated kittens and ideally before placement in adoption, although this is not an absolute for individually housed kittens or individually housed litters of kittens.<sup>4</sup>

All cats/kittens entering the shelter should have a picture taken on intake and individual identification made. This is essential for accuracy of medical records. For litters of underage kittens too small for ID bands or microchips, consider an alternate way of identifying them with something like writing a number inside their pinna with a permanent marker or using different colored dots.<sup>5</sup> Each should be assigned an individual animal ID number just like any other animal entering the shelter on intake. Cage cards help track the individual identification numbers and will be important for maintaining accurate medical records and tracking daily weight.

Intake staff should be trained to do a basic physical examination to identify any medical concerns. This is important for identifying common illnesses like URI and conjunctivitis and for identifying any animals needing immediate veterinary attention. All cats and kittens should also

receive a routine Wood's Lamp Screening as part of their intake exam so that any ringworm suspects can be immediately identified.<sup>6</sup>

[Click here](#) for a video from Maddie's Institute demonstrating a physical exam on an orphan kitten.

## **Vaccination Protocols**

Upon admission, all kittens between four and 20 weeks of age should receive a vaccination with a modified live product containing FPV, FHV-1, and FCV and then boosters every two to three weeks until 16-20 weeks of age while in the sheltering environment.<sup>3</sup> A modified live vaccine is preferable in the animal shelter facility because the potential onset of immunity is much faster than with a killed product.

Cats should be vaccinated low in their right forelimb following AAFP vaccination site recommendations. All cats over 20 weeks of age should receive a vaccination with a product containing FPV, FHV-1, and FCV on admission and then one booster in two to three weeks.<sup>3</sup> For most shelters, the benefit of vaccinating the pregnant or nursing queen outweighs the risks of not vaccinating her.<sup>7</sup> While there is a possibility the kittens may develop cerebellar hypoplasia due to vaccination of the queen, natural infection with panleukopenia will often prove fatal to both the queen and her kittens. Vaccinating a nursing queen does not provide any protection to the kittens. They only receive maternal antibodies from the colostrum they receive in the first one to three days of life.

Kittens in foster care should be scheduled to receive their first vaccine at four weeks of age if weighing at least 1 pound (454 grams). Vaccinations can be harmful to kittens under four weeks of age and may cause cerebellar hypoplasia.

Pyrantel pamoate should be repeated with each booster vaccine until kittens reach 16 weeks of age; then monthly until six months of age. Selamectin can be given routinely each month. All cats and kittens over 12 weeks of age may receive a rabies vaccination during a veterinary examination.<sup>3</sup>

## **Creating an Extensive Foster Care Program**

A robust foster program is essential to a kitten nursery. Foster homes

provide kitten care for shelters without 24-hour nurseries and for kittens not thriving in the nursery setting. An extensive foster program is also an invaluable source of temporary homes for kittens when no space is available at the nursery. Foster parents can also be an extension of the adoption program by supporting community adoption events and even finding homes for the kittens they foster.

Setting up a nursery will be easier for shelters with a well-established foster program. These shelters can rely on foster parents who will retrieve orphaned, unweaned kittens on the same day they arrive. Foster parents great at bottle feeding can “trade-in” a litter transitioned to solid food for a new litter of unweaned, orphaned neonates instead of fostering the older babies until ready for adoption.

Enlisting new foster parents is an on-going endeavor for all shelter nursery programs. Social media, the shelter’s website, and word of mouth are all traditional ways to recruit foster parents, and a “kitten shower” is another recruitment tool. Fosters also need to know what the shelter will provide, such as medical care, food and litter, and that the shelter takes the kittens when ready for adoption unless the foster parents find adopters on their own.

Another way foster homes help in the height of kitten season is by keeping foster kittens until shelter space opens for them. Foster parents will also often volunteer to bring the kittens living in their homes to offsite adoption centers on weekends or bring them to shelter-hosted adoption events.

## **Controlling the Spread of Infectious Disease**

By far, the biggest risk to underage kittens is exposure to infectious diseases, therefore every action within the nursery from feeding the kittens to cleaning the cages to nursery staff and volunteers entering and exiting the rooms must be performed to keep potential pathogens out or at least confined to one area. Even within the nursery, strict adherence to procedures preventing cross contamination cannot be overstressed.

One of the items highly recommended for each room is a bound or electronic copy of all protocols. Those protocols should include detailed step-by-step instructions on cleaning everything within the room, such as cages, toys, bedding, bowls, and litter boxes. Not only should the order of

completing the task be included so should the finer details, such as how to change bedding or measure out the proper amount of food. Between the written protocols and the nursery staff/volunteer training, ensure each person working within the nursery understands not only the practices but also why adherence to them is so imperative.

## **Sample Outline of a Kitten's Planned Movement through a Kitten Nursery**

- Intake is performed in animal admissions. Refer to the Intake Protocol for more information. All cats and kittens will have a wood's lamp examination performed during the intake exam. The medical department will be alerted if any animals are ringworm suspects before they are transported to the nursery.
- All underage kittens will be transported to the kitten nursery. Volunteers at the nursery may be needed for transport throughout the day to ensure the kittens are fed within 2 hours of intake.
- Each of the housing rooms is used for one week of intakes. No kittens will be moved into another room. The kittens remain with their intake group for at least 14 days after the last kitten has entered the room.
- For the first 14 days of their stay, new intakes are quarantined in their room and monitored closely for any signs of illness. They may not be moved anywhere else unless sent to foster care. Unfortunately, panleukopenia is common in the area and we must control the spread as much as possible.
- Any kittens that break with URI or conjunctivitis will be treated in their cage. Their cage will be cleaned/handled last in that room. Please refer to the Cleaning Protocol for more information.
- A care card will be maintained for each kitten. Volunteers will record their weights daily.
- Once kittens have been through the 14 day quarantine period, it is time for some serious play and socialization. Although kittens may still break with URI or conjunctivitis, these are treatable in the nursery.
- Once a kitten is past the quarantine period and is 8 weeks of age, place a GO card on its cage to alert the medical department that it is ready to graduate from the nursery.
- Kittens at the nursery are eligible for foster care at any time. The focus in the foster department will be to move unweaned, bottle-fed kittens into foster care. Once the youngest kittens are in foster care,

those eating mush will go to the remaining available foster homes. If you are interested in fostering at any point in time, please contact the foster coordinator.

## **PPE (Personal Protective Equipment) Practices for Staff and Volunteers**

The best practice for gowns and other protective garments is to assign one gown or smock to each cage. Staff or volunteers must wear the assigned gowns when cleaning, feeding, and socializing the kittens in that cage. These gowns should be stored above or below the associated cage. Another option is using disposable gowns. However, this method is often too costly for a shelter budget. Whichever procedure is used, staff and volunteers must understand the significance of wearing and, when necessary, changing the protective garments, and never, ever wearing them outside of the particular nursery room. They must also understand the need to change gloves between cages. These practices may be impractical for some nurseries, but allowing any contact between items in individual rooms opens the pathway for the spread of infectious disease.

If for any reason the above practices cannot be followed, the constant potential for exposure is always present so additional procedures designed to minimize the risk are necessary. If one gown per cage is not possible such as in a room with no way to store the gowns, an alternative practice allowing the use of one gown per person within a single room requires these additional steps:

1. Protective garments, such as gowns, are worn only within a single room. These garments are washed or disposed of daily.
2. New gloves are worn when cleaning and feeding kittens in different cages. Gloves are changed between cages as well as when handling the common supplies in the room.
3. Kitten cleaning and feeding progresses from an order of the healthiest kittens to kittens with mild illnesses. Kittens are “color coded” by a green, yellow or red tag on cages. These identification markers convey the health status of the cage’s inhabitants as: a) kittens in cages tagged GREEN were healthy on intake; b) kittens in cages tagged YELLOW need to be monitored for illness, perhaps because someone noticed loose stool, sneezing or ocular discharge; and c) cages tagged RED house kittens currently undergoing treatment for an illness. Color coding is simple but any

method works that easily informs staff and volunteers of the health status of the kittens within a cage. The best approach uses a visual signal, such as a laminated care card, clip, or clothespin.

4. Upon entering one of the rooms, the staff member or volunteer puts on a fresh gown and gloves and walks the room, visually checking all the kittens. If any signs indicate a green-tagged kitten may be getting a URI or if diarrhea is present in the cage, the staff or volunteer member places a yellow tag on the cage and completes a request for a veterinary exam.
5. After the visual inspection is completed, cages should be cleaned in an order of green to yellow to red. This order minimizes the opportunity for infectious diseases to spread and allows for the treatment of any mild illnesses such as URI and conjunctivitis without needing to move kittens from their original cage.
6. The practice of allowing a single gown per person per room only works if the staff member or volunteer moves from green to red cages. However, gloves must be changed between cages and handling common supplies. If at any point, a yellow or red tagged kitten is handled and the person needs to return to kittens coded "green," the staff member or volunteer must change to a clean gown. When finished in the room, the gown should be disposed of if disposable or placed in the laundry basket if non-disposable.

## **Cleaning and Disinfecting**

Within the nursery, one of the most important allies in fighting potential pathogens is a good disinfectant. Any disinfectant considered for use should be researched for required concentration, contact time, and efficacy against different pathogens, as well as staff and animal safety concerns. The respiratory tracts of all cats but particularly kittens are sensitive and easily irritated so the disinfectant must be both powerful against the pathogens targeted and yet gentle enough to not make kittens more susceptible to upper respiratory infections. Accel, an accelerated hydrogen peroxide, is one possible choice for a kitten nursery disinfectant. Not only is Accel effective at the correct concentration against calicivirus and panleukopenia with a 5 minute contact time but it is also effective against dermatophytosis with a 10 minute contact time.<sup>5,8</sup>

## **Deep Cleaning**

All cages undergo deep cleaning after the cage is vacated, before it can



be used again. A deep cleaning is also recommended anytime a cage is heavily soiled. Deep cleaning involves emptying the cage and cleaning every part of it with a disinfectant. If kittens are still residing in the cage and you have double sided housing, the kittens can be shut on one side while the other side is cleaned. If you only have single sided housing consider having feral cat dens or carriers in each cage that the kittens can be shut in and removed during deep cleaning. Nursery staff and volunteers cleaning the cage must know how to remove all items properly to prevent the potential spread of diseases. All organic debris (scattered litter, food or clumps of feces) must be removed before disinfecting begins. The debris should be carefully removed, taking care not to scatter it onto the floor or cage below. Once the cage is free of loose debris, all surfaces of the cage, including the doors and ceiling, must be cleaned before disinfecting to remove any caked-on debris. Nursery protocols should include descriptions of what to discard, what to clean or launder, and how to safely do so. Disinfecting the cage involves spraying the disinfectant inside of the cage, covering all surfaces, including the ceiling. A controlled spray is necessary so no misting or splattering into neighboring cages occurs. One way to avoid inadvertently spraying the nearby cages is to liberally spray a clean rag and wipe down the edges and doors of the cage. Spray the cage again using the disinfectant and wipe down all surfaces of the cage, including the doors with a clean rag. Allow this second application to sit for the product's recommended contact time before wiping dry with another clean rag. If using Accel, no rinse is needed. Place a fresh litter box with litter, empty food/water bowl and towel or blanket inside the cage. The cage is ready to use again. *For more information, refer to [Sanitation in Animal Shelters](#).*

### **Spot Cleaning**

Spot cleaning of cages must be done daily. Spot cleaning involves light tasks such as freshening the litter box, wiping up spilled food and water, removing any feces, and so on. As with any other task that involves interacting with the kittens or the cage, the staff member or volunteer must wear a gown and new pair of gloves. Kittens need not be removed from a double-sided cage if the kittens can be kept in the side not being cleaned, or if it is not double-sided, if the kittens can be shut inside a feral cat den. Kittens may need to be moved temporarily to a clean cat carrier if the cage is not double-sided or does not have a feral cat den. Cleaning tasks should follow the nursery's protocols. At a minimum, bowls should be cleaned if required, food and water refreshed, litter boxes scooped or

emptied, and the bedding straightened or replaced if soiled. If bedding or other items are removed, nursery staff should know never to handle items such as bedding or newspapers in a way that might spread fur, litter, or other organic debris outside of the cage or the trash bin. This is another precaution to prevent the spread of potential pathogens. All bedding, toys, and newspapers may remain in place during spot cleaning if not needing cleaned or replaced. *For more information, refer to [Sanitation in Animal Shelters](#) and [Spot Cleaning Cat Cages](#).*

## **General Cleaning**

The same sort of care taken with cleaning the cages must also be applied to general nursery cleaning. Nursery staff and volunteers must use only the room's color-coded cleaning items and supplies. All countertops in the room must be cleaned, then sprayed with disinfectant. Swept floors need to be mopped with disinfectant properly diluted for the task per the manufacturer's recommendations. Heavily soiled spots (encrusted dirt, food, litter, etc.) need to be scrubbed.

Dirty carriers, transport cages, and feral cat dens should be cleaned and dried outside the nursery, then sprayed with a disinfectant solution mixed per manufacturer's recommendations and allowed to sit for the required contact time. The items do not need to be rinsed if Accel is being used and must be allowed to dry.

Dirty laundry (bedding, rags, gowns, etc.) should be kept in laundry baskets or containers and never piled on the floor. Laundry baskets should have a fresh trash bag placed in them daily so the laundry can be taken to the laundry room without removing the basket from the room. This method helps prevent any cross contamination. Heavily soiled items or items that contacted panleukopenia or dermatophytes must be thrown away immediately. Towels, sheets, blankets, pillow cases, washable pet beds and pillows are to be washed with HOT water. Overloading a washing machine results in a "less than clean" condition. Persons handling dirty laundry need to wear protective gowns to keep from contaminating personal clothing. When handling clean laundry, nursery workers must make sure they are not wearing a contaminated gown to keep from contaminating the laundry.

Using disposable litter pans eliminates washing litter pans in the same area, and often at the same time, as the bowls, dishes and toys. Having a

dishwasher in each of the nursery rooms to wash the dishes would be ideal but not practical for many facilities. For manual washing, hot soapy water should be used for washing bowls, dishes and plastic toys. After they are cleaned, the items should be soaked in a disinfectant solution for the recommended concentration and contact time, then rinsed with fresh water. The easiest way to ensure compliance with this three-step cleaning process of all dishes is to set up a cleaning area with three utility sinks in a row. Let items air dry before returning them to the cages.

Bottle feeding equipment must be cleaned after each feeding. Each bottle and nipple must be washed with soapy water until all residues are gone. Disinfect the feeding equipment in the strength recommended by the product manufacturer (For example, if using Accel, the solution would be 1:64 or two ounces per gallon of water) for the recommended contact time, then rinsed with fresh water. If available, a dishwasher is the best way to disinfectant the feeding equipment. Allow all bottles and nipples to dry before the next use. *For more information, refer to [Sanitation in Animal Shelters](#).*

## **Medical Flag System**

It is important to have a plan in place so nursery staff and volunteers know who to contact and when for a medical concern with kittens in the nursery. You want to ensure that kittens receive immediate attention when needed but that the nursery staff and volunteers do not contact medical staff constantly. One way to manage this is through a list of medical warning signs so that they know what they should do. In the example below, a system with a list of red flag and yellow flag signs was established.<sup>5</sup>

**Red Flags – if any of the following occur, alert the medical staff member on call immediately.**

- Kitten did not eat during last meal.
- Kitten lost weight.
- Kitten has liquid diarrhea.
- Kitten is dehydrated.
- Kitten is listless.
- Kitten vomited repeatedly.
- Kitten is bleeding.
- Kitten has neurologic signs.

- Kitten found deceased in cage.

**Yellow Flags – if any of the following occur, monitor the kitten, alert the nursery staff member, and fill out a veterinary exam request form. These forms are checked at least once daily.**

- Kitten has sneezing, wheezing, nasal discharge and/or coughing.
- Kitten has ocular discharge.
- Kitten has mild lethargy or depression.
- Kitten did not gain weight.
- Kitten has loose stool.
- Kitten has occasional vomiting.
- Kitten has decreased appetite.
- Kitten has difficulty urinating or defecating.
- Kitten is limping.
- Kitten has behavior not normal for the kitten.
- Kitten has an area of hair loss.

## **Common Illnesses seen in a Kitten Nursery**

Many kittens will be admitted into the facility in poor body condition, heavily parasitized, and suffering from mild illnesses.<sup>1</sup> While we cannot cover everything in depth here, it is important to mention that there should be nursery protocols in place for diagnosis, treatment, and prevention of the common illnesses seen in the local kitten population. Conditions to cover include things like flea infestation, flea anemia, ear mites, intestinal parasites, coccidiosis, upper respiratory infections (including feline herpesvirus and calicivirus), conjunctivitis, diarrhea, dermatophytosis, and panleukopenia

### **Dermatophytosis**

The number of dermatophytosis cases vary, often by season. An increase in the prevalence of the disease usually coincides with “kitten season” and for some regions, it is a constant challenge. Regardless of the geographical location of a kitten nursery, underage kittens often come in with ringworm. Intake staff must be trained on what the next steps will be for any cats or kittens with a positive Wood’s Lamp exam at intake or with suspicious alopecia.

Any staff handling ringworm suspects should wear a gown and gloves,

plus take precautions to avoid contamination of surfaces like an examination table. To avoid contamination of work surfaces, disposable drapes are a great option, followed by disinfection with a product effective against dermatophyte spores. Confirmation of a diagnosis of ringworm requires a visual examination, Wood's Lamp examination, direct microscopic examination of glowing hairs, and a fungal culture.<sup>7</sup>

All shelters in general, but particularly those with a kitten nursery, should develop formal, written protocols dealing with any ringworm positive cats in their care. These protocols must address diagnosis, isolation, treatment, cleaning protocols, and clearing the cats or kittens for adoption. *For more information, refer to the Ringworm Guidebook.*

### **Panleukopenia**

Any animal shelter taking in cats and kittens dreads the appearance of a panleukopenia positive cat. Panleukopenia can be absolutely devastating in a kitten nursery. The nursery population is vulnerable and a large number of kittens are housed within the facility. Strict isolation of the kittens in the nursery and sound protocols help minimize the spread of panleukopenia, but even these steps will not completely stop isolated cases from occurring in newly admitted kittens exposed prior to admission and asymptomatic on intake.

Panleukopenia diagnosis can be made on a snap ELISA test for canine parvovirus and suspected with an extremely low white blood cell count diagnosed on CBC.<sup>9</sup> Since sudden death can occur in kittens that appeared healthy the day before, any kitten found dead in its cage should be tested for panleukopenia.<sup>1</sup> Sound medical, vaccination, isolation, and cleaning protocols help minimize the potential for spread of the disease by any kitten shedding the virus. A written protocol for panleukopenia must be developed and staff and volunteers must understand the importance of adhering to the protocols and understand how devastating the spread of this virus would be. At a minimum, the panleukopenia protocol addresses diagnosis, isolation, treatment, cleaning protocols, and the decision to euthanize. Any panleukopenia positive kittens, as well as their cagemates, must be removed from the nursery and placed into a strict isolation area for treatment. The potentially exposed kittens in the room must be quarantined for 14 days. *For more information, refer to the Panleukopenia Guidebook.*

## Daily Monitoring

Nursery staff and volunteers need to observe kitten health on a daily basis. This task should include monitoring of appetite, urination, defecation, any concerning signs, and updating weight. Tracking the kittens' health and progress is most easily accomplished with individual monitoring sheets, which are kept in a room binder. Keeping the sheet on the cage may seem more practical, but with the messiness and playfulness of kittens, the binder is usually the safer option for the paperwork.

Each room should post a schedule for daily veterinary rechecks and the handling of any emergencies that arise. The staff and volunteers can be trained to prioritize any health concerns with a method like the red and yellow flags outlined.

## Training Staff and Volunteers

Abandoned kittens are often underweight, heavily parasitized and suffering from an untreated illness when admitted to an animal shelter, which makes the care of them in the nursery even more challenging.<sup>5</sup> Only good protocols and practices strictly followed by everyone entering the nursery will afford these kittens the opportunity to flourish and survive. Therefore, all persons involved with the nursery will need some level of training.

Good training involves a variety of teaching techniques – short seminars, guided tours, hands-on practice, and shadowing.<sup>5</sup> It is likely that a majority of the nursery staff will be volunteers. These persons may have little knowledge or understanding of caring for these vulnerable kittens. Training should cover both the “what” of the practices and protocols plus the “why.” Both staff and volunteers need to know “why” adhering to each and every practice is critical to the health of the kittens. Learning the protocols and basic steps in caring for the kittens is good seminar material.

Depending upon staff/volunteers' nursery roles, hands-on training might include learning to draw blood, do fecal floats, calculate meds, give meds, and make entries into shelter software.<sup>1</sup> In one form or another, training must cover every step and procedure for caring, cleaning, playing, and feeding from intake to adoption release. No matter how good and

engaging the training is, people will not recall everything covered. If relying heavily on volunteers, at least one to two staff members should be on each shift to supervise, ensure consistency, and relay important information. A good handbook is also an essential, so all nursery staff and volunteers should receive, or have access to, a nursery handbook.<sup>5</sup>

## **Supersizing the Adoption Program**

All of these kittens that have gone through the nursery and foster programs will need homes because ultimately that is what all of this is about! Shelters with nurseries will need some creativity to supersize their adoption programs. There are several things that can help. Move kittens into adoption as soon as possible because they are most desirable to adopters at the six to eight week age range. Market the nursery and adoption program by letting adopters know that the kittens are “graduates” of the nursery program. Have adoption specials and make them fun like “Free Feline Fridays” and “Two Purr One.” Consider using adoption space at local pet stores if available. Do not underestimate the power of the internet and social media. Increase adoptions by using good photos, bios, videos, and marketing on your website and your social media outlets.

Build a media partnership. Many local television stations run animal shelter adoption segments during news programs. Be available to television, radio, and newspaper media for interviews. Often television and radio stations will run community service notices (such as an adoption event) and newspapers usually print press releases free of charge.

Expand on your community partnerships. Large weekend events with coalition partners draw in many more potential adopters. This approach eliminates competition between agencies – advantageous because it strengthens community relationships, pools marketing funds, and allows more ways to “spread the word.”

## **References**

1. Radosta, L. in *Small Animal Pediatrics: The First 12 Months of Life* (eds. Peterson, M. & Kutzler, M.) 88–96 (Elsevier Saunders, 2010).
2. Moriello, K., Newbury, S. & Diesel, A. in *Infectious Disease*

- Management in Animal Shelters (eds. Miller, L. & Hurley, K. F.) 275–298 (Wiley-Blackwell, 2009).
3. Scherk, M. A. et al. 2013 AAFP Feline Vaccination Advisory Panel Report. *J. Feline Med. Surg.* 15, 785–808 (2013).
  4. Levy, J. et al. 2008 American Association of Feline Practitioners' feline retrovirus management guidelines. *J. Feline Med. Surg.* 10, 300–316 (2008).
  5. Broadhurst, J. in *August's Consultations in Feline Internal Medicine*, Volume 7, 1e (ed. Little, S. E.) 706–717 (Saunders, 2015).
  6. Moriello, K., Newbury, S. & Diesel, A. in *Infectious Disease Management in Animal Shelters* (eds. Miller, L. & Hurley, K. F.) 243–273 (Wiley-Blackwell, 2009).
  7. Newbury, S. et al. Guidelines for standards of care in animal shelters. (Association of Shelter Veterinarians Corning, NY, USA, 2010) at <http://www.sheltervet.org/assets/docs/shelter-standards-oct2011-wforward.pdf>
  8. Moriello, K. A. & Hondzo, H. Efficacy of disinfectants containing accelerated hydrogen peroxide against conidial arthrospores and isolated infective spores of *Microsporum canis* and *Trichophyton* sp. *Vet. Dermatol.* 25, 191–194, e48 (2014).
  9. Tuzio, H. in *Infectious Disease Management in Animal Shelters* (eds. Miller, L. & Hurley, K. F.) 183–196 (Wiley-Blackwell, 2009).