The definition of dystocia has an origin from the Greek dys for difficult and tokos for birth. Dystocia is either classified as functional or obstructive. Inertia is another term used to describe a functional dystocia. This is the most common cause of dystocia. What happens is that the contractions that are being produced are not strong enough to move the fetus. Obstructive dystocia is when the fetus is too large to pass through the birth canal or a malpresentation (one thoracic limb forward, dorsoflexion of the head and neck, malformed fetus or death of fetus). Some breeds of dogs and cats have higher rates of developing dystocia. Brachycephalic breeds of dogs and cats are the most common. Bulldogs, Pugs, Cocker Spaniels, Dachshunds, Terrier breeds and Welsh Corgis have the highest incidence. For felines, the Devon Rex, Cornish Rex, British Short-Haired, Persian and Siamese have a higher incidence of dystocia. Radiographs should be taken to establish the cause of the dystocia. Radiographs can show if a fetus is deceased. This is demonstrated with extra fetal intrauterine gas formation, an overlapping of cranial bones and abnormal positioning of the fetus in utero. Inertia, which is the most common form of dystocia, however cannot be diagnosed with the aid of radiographs.

The viability of the fetuses can be predicted through fetal heart rate monitoring. Abdominal ultrasound can be used to assess fetal viability and heart rate. Normal heart rate for the fetus should be double the rate of the dam. A heart rate of 180-245 should be expected in puppies and 180-265 in kittens. Increase in the fetal heart rate can occur with movement. A fetus may be in distress if there is a prolongation in a decreased heart rate. Malformations may also be able to be visualized with abdominal ultrasound. Because both the mother and the fetuses lives are at stake during a dystocia it is important to prioritize with the client which is most important to save if a choice had to be made. Lack of oxygen is the biggest cause of fetal death with dystocia. It is important to supplement the dam with oxygen during diagnosis and treatment for the dystocia.

Once a cesarian section is deemed necessary it is important to plan ahead for proper anesthetic use and monitoring during and after surgery. The blood flow to the uterus is not regulated well on its own. It is influence by the dam’s blood pressure. Therefore appropriate monitoring of blood pressure on the dam should be performed in order to avoid hypotension. It has been shown that hypotension in the dam (<100 mmHg systolic) has directly resulted in fetal distress. If the dam is hypotensive she needs to be treated immediately and aggressively. Crystalloids should be administered as a first choice. However, colloids may be given if necessary. Some positive inotropes may be given to the dam if necessary after crystalloid and colloid administration. Positive inotropes such as Dobutamine and Dopamine are safe to give, however in higher doses dopamine may cause vasoconstriction which would not be beneficial for uterine blood flow. At higher doses tachycardia and arrhythmias can develop.
An anesthetic protocol should be chosen carefully as to provide survival for both fetuses and the dam. Anesthetic drug exposure should be kept to a minimum. Therefore it is important to plan ahead by having all supplies ready to go, surgically clip the dam prior to induction and the doctor that will be performing surgery should be scrubbed in and ready for surgery prior to inducing. Anesthetic gas dosing needs to be decreased in the dam during cesarian surgery. Due to the presence of an increased level of progesterone, the inhaled gas potency is increased. Therefore the minimal amount of gas anesthesia needed to maintain anesthesia is critical. The potency of epidural and/or spinal anesthetics is also increased and therefore the dosing should be decreased if this form of pain control is selected. The doses should be decreased by about 25-30% in both gas and epidural/spinal anesthetics. Drugs that cross the blood-brain barrier cross the placenta so knowing this helps aid in picking appropriate drugs. Glycopyrrolate may be administered preoperative to maintain heart rate. Propofol is a safe choice for anesthetic induction, followed by gas anesthesia for maintenance. Drugs that should be avoided because of higher incidence of neonatal mortality are methoxyflurane, medetomidine, ketamine and xylazine. Line blocks and epidurals may also be considered. Line blocks can be utilized with 2 mg/kg lidocaine given along the ventral midline. The dosing for epidural lidocaine is 2-3 mg/kg (do not give more than 6 ml total).

Manipulation of the uterus once in surgery is important for the viability of the fetuses. It has been shown that the Apgar scoring may decrease if there is a prolongation of manipulation of the uterus during delivery.

There are several things that the veterinary staff needs to have prepared for the delivery of the fetuses. Suction bulbs (infant nasal syringe bulbs) should be sterilized and ready to use. Once the fetus has been delivered the fetal membrane must be removed. The umbilical cord should be clamped. It should be clamped about an inch from the body wall with a hemostat and then removed from the placenta. Then the oropharynx and nares need to be suctioned and cleared of secretions. This needs to be performed quickly to avoid hypoxemia. Do this as gently as possible as the tissue is very sensitive. The swing technique is no longer recommended. Cerebral hemorrhage or subdural hematoma could result in death. The neonate could inadvertently be dropped or gastric contents could be forced into the pharynx, leading to aspiration. Think of it as “shaken baby syndrome”. The puppies or kittens should be rubbed with a warm towel to maintain temperature and stimulate respiration.

Immediately after delivery the puppies or kittens need to be kept in a temperature regulated environment and may benefit from oxygen supplementation. A warm water circulating blanket should be utilized or an incubator if available. If warm water bottles are used it is important to wrap them with a thin towel so as not to burn the puppies or kittens.

Naloxone should be on hand and ready to administer if the dam received a narcotic before or during cesarian section. One to five drops sublingually through a 22 gauge needle can be given. If respiratory stimulation is needed 1-5 mg of Doxapram can be given sublingually. Atropine may be given for bradycardia but it is important to make sure first that the bradycardia is not due to hypoxemia. Epinephrine may also be given sublingually.

Close monitoring of the neonates is necessary following cesarian surgery. Stress should be minimized. After the neonates have been stabilized and the dam has recovered from
anesthesia they should be placed with her and encouraged to suckle. This stimulates the release of oxytocin needed for milk production.

Overall, choose drugs for anesthesia that are able to be reversed or are short acting. Monitor the dam closely for hypotension during anesthesia. Provide adequate IV fluid therapy and oxygenation prior to and during surgery. Be prepared with appropriate supplies for quick delivery of fetuses.

Following cesarian or natural delivery the first three days are the most critical. However, neonates should be monitored closely over the first two weeks following delivery. Fading neonatal syndrome is a term used to describe this phenomenon. Mortality increases in puppies or kittens born to older dams as well as overweight dams. Mastitis in the dam may also increase mortality in the neonates. Neonatal deaths are either classified having noninfectious or infectious causes. Some of the infectious diseases that may cause the death of a neonate are viral infections such as parvovirus, calicivirus, FeLV, coronavirus, canine adenovirus 1, canine distemper virus and Herpesvirus. Bacterial infections and parasitic (Coccidia, Cryptosporidium, Giardia, Toxo) infections may also be the cause of death in a neonate. There are important environmental factors to consider when caring for neonates. The temperature should be kept around 85 degrees farenheit with 55-65% humidity. The use of warm water circulating blankets or heat lamps near one side of a whelping box may be used to provide added warmth. Exposure to other animals should be limited to decrease exposure to infectious disease. A normal rectal temperature for a neonate is 96-97 degrees farenheit. Usually by day 7 post delivery the temperature should increase to around 100 degrees farenheit.

Weights should be monitored closely to ensure that adequate nutrition is being received (the dam is nursing adequately) and the neonates are growing appropriately. Newborn kittens usually weigh 90-110g at birth and should gain anywhere from 7-10 g/day. By six weeks of age a kitten should weigh around 500g. Puppies typically should gain 5-10% of what they weighed at birth each day. By 10-12 weeks of age their weight should be double what it was at birth.

Some indications for illness in neonates are persistent crying, decline in activity, absence or decrease in suckling, weight loss or failure to gain weight, dry haircoat, limp body or decreased tone of muscles. An indicator for abnormal temperature may be neonate positioning in the whelping area. If the neonates are piled on top of one another they possibly may be hypothermic. If they are avoiding contact with others it may be an indication that the neonates are hyperthermic. Other physical exam findings that may indicate illness would be dehydration, bloated appearance to abdomen, pale mucous membranes or cyanosis. If the neonate is hypoglycemic some physical exam findings might be lethargy, weakness, bradycardia, respiratory distress. Seizures or coma are what follows prolonged hypoglycemia.

After physical examination is performed, the first diagnostic test performed should be blood glucose. If enough blood sample is able to be obtained a full CBC and biochemistry panel can be performed. Urinalysis, urine culture and a fecal should be performed next. Radiographs and/or ultrasound may also be useful in determining the cause of the fading neonate. Prognosis is typically guarded to poor in fading neonates. Owners should be notified of this prognosis and the cost that is associated with providing supportive care needed. In kittens neonatal isoerythrolysis should be considered. This is an immune- mediated disease that occurs when a kitten with type A blood drinks colostrums from a mother with type B blood. The antibodies
contained in the colostrum are ingested and absorbed in the GI tract. The antibodies bind to the kitten's red blood cells and destroy them because they are recognized as foreign. Once the colostrums is ingested the kitten may begin to show signs of fading within hours to days. They stop nursing and do not grow. Pigmenturia (reddish brown urine) is a distinguishing characteristic of NI. The kittens will also become icteric (hemolysis induced) and anemic. They will be lethargic and/or depressed.

Treatment consists of providing warmth for the patient, especially if it is hypothermic. The patient should be rotated every hour to avoid atelectasis and maintain distribution of warmth. Rectal temperature should be checked on an hourly basis. If hypoglycemic the initial treatment should be to administer oral or IV glucose solution. It is important to dilute dextrose solutions when giving them intravenously. Typically they should be diluted to 25% when administering glucose IV. To maintain glucose levels the patient should be placed on a 5% dextrose CRI if receiving IV fluids. If the neonate is hypokalemic the fluids should also contain potassium supplementation. Next the underlying problem should be treated. Antibiotics may be administered to neonates if necessary. Those that are safe include amoxicillin, Clavamox, cephalosporins, erythromycin, penicillins and tylosin. Antibiotics that should not be given to neonates are trimethoprim, tetracyclines, sulfonamides, polymyxin, enrofloxacin, ciprofloxacin, chloramphenicol, aminoglycosides. It is important to also provide adequate nutritional support to the neonate. Caloric needs should be calculated and a plan for nutritional supplementation orally or parenterally. The neonate may need to be tube fed. Utilize nutrition orally if at all possible. If the neonate is vomiting this is not an option and PPN, TPN should be used or a feeding tube can be placed.

A properly planned C-section can eliminate any injury to the neonates and dam at the time of birth. It is important to be fully prepared to the worse that could happen. Prep the dam prior to C-section in order to minimize anesthesia. Use lower drug dosages. Minimize handling of the neonates, yet provide close monitoring to ensure post delivery well-being. Quick and thorough treatment for illness in newborn puppies and kittens is imperative for survival.