Review- Foaling

Impending parturition
-Waxing: 4 days to 24 hrs prior to foaling
-Colostrum: 24-48 hours prior to foaling
-Maiden mares little to no signs
-Mammary secretions total Ca content to above 10 mmol/L when foaling is imminent
-Sacroiliac ligament relaxation days to hours prior to parturition
-Relaxation, elongation and edema of vulva last few days of gestation

Length of gestation
-335-342 average. Range 305- 400 days
-Pregnancies beginning late winter/early spring average 10 days longer

Endocrinology
-Progesterone increases throughout pregnancy, drops after birth
-Estrogen peaks between 200-250 days then decreases
-Prostaglandin low during pregnancy, slight rise 7-10 days prior to parturition
-Oxytocin augments myometrial contractions and increases rapidly in the second stage of parturition as the fetus enters the cervix and vagina
-Rising prostaglandin and oxytocin levels provide stimuli for strong uterine contractions
-Initial stimulus to parturition unknown?

Preparation for delivery:
-Wrap tail
-Clean perineal area with mild soap

Stages of Parturition
Stage 1: Increase in active contraction of myometrium and dilatation of cervix. Patchy sweating, mild agitation as early as 4 hrs prior to birth. Restlessness, lying down and getting up, stretching as if to urinate, looking at flank, frequent passing of small amounts of feces, leaking colostrums and yawning may also be observed. If this stage is interrupted foaling may be delayed several hours of even days. Fetus has active role in positioning itself for delivery. At onset of increased uterine contractions foal will rotate from dorsopubic to dorsocranial position. Mare may roll as this occurs. As uterine contractions dilate the cervix the foal passes through the cervix into the birth canal with head and legs extended. Stage 1 terminates with the rupture of the chorioallantoic membrane as it is forced through the dilated cervix.

Stage 2: Begins abruptly with the rupture of the chorioallantoic membrane and the passing of small amounts of urine-like allantoic fluid. As the fetus enters the birth canal, it stretches the soft tissue of the pelvic cavity and initiates the expulsive force of abdominal muscular contraction (Ferguson's reflex). At this point transparent, bluish-white amnion appears at the vulva and the mare assumes recumbency. 3-4 contractions will are generally followed by rest periods of 2-3 minutes. Most mares will get up and change positions at least once during second-stage labor.

Normally one foreleg precedes the other by about 15cm. Straining stops abruptly when the shoulders pass through the pelvis. Duration generally about 17-20 minutes but range is 10-60 minutes. Mare may remain recumbent for up to 40 minutes following delivery. The umbilical cord remains intact after delivery, and significant amounts of blood are transferred from the placenta to the foal as the uterus contracts. The mare should be allowed to remain resting for several minutes to allow this transfer of blood. Premature breakage of the umbilical cord can deprive the foal from as much as 1L of blood. Cord generally breaks about 5cm from the foal's abdomen as mare or foal attempt to rise.

Stage 3: Dehiscence and passage of the fetal membranes. Peristaltic waves begin at the tip of the horns. The apex of the chorioallantoic sac becomes inverted and as the sac is "rolled" down the horn and fetal villi are pulled from the crypts. In most cases the placenta is expelled with the allantoic surface outermost due to this inversion. During this passage the mare may show signs of abdominal discomfort/colic. Occasionally the mare will pass the placenta while down prior to rupturing the cord. If this occurs the placenta should be separated from the foal by placing one hand flat on the foal's abdomen with the umbilical cord between the fingers while gentle firm traction is applied to the cord with the other hand.

Assisted delivery:

-If mare appears to be having difficulty: Clean mare and hands. Cover rectal sleeves and sterile gloves with ample lubrication. Initial examination should determine presentation of foal, size and viability. Simple manipulations may be possible with mare standing. Foal may be pushed forward (toward mare's nose) with one hand as other hand corrects malpresentation. Protect the birth canal from trauma during manipulation. Once fetus is in the correct position no more force than two adults pulling on obstetrical chains/cords should be used. Completion of delivery may be interrupted by hiplock or by the foal's hind feet becoming lodged on the pelvic brim. If progress stops as the abdomen of the foal is passing, the pelvis should be explored for presence of feet. If none are found gentle traction may resume. If hind feet are present in the birth canal they must be repelled prior to delivery being completed.

Aftercare:

-Dip umbilical stump in mild iodine solution
-Keep an eye out for the meconium and consider warm water enema if there is any sign of impaction.
-Observe normal urination
-Examine fetal membranes to determine complete expulsion

Failure of passive transfer

Foal should stand and nurse within 3 hours. Equine placenta is epithelial-chorial so there is no transplacental transfer of antibodies. The foal's small intestine is permeable to protein (antibodies) for approximately 24hrs after birth. If the foal is not standing and nursing within 3 hours the foal should be assisted or the mare should be milked and the foal should be fed via bottle or NG tube. If the mare is leaking milk prior to parturition,

the foal should be given colostrum from another source. When indicated supplemental colostrum should be administered within 12 hours of birth. Subnormal serum IgG concentrations 24 hrs after birth is the basis for diagnosis of failure of passive transfer.
-Serum IgG of less than 200mg/dL indicates complete failure of passive transfer
-Serum IgG 200mg/dL- 800mg/dL indicates partial failure of passive transfer. Many foals will remain healthy in good management conditions if the foal has a serum IgG of at least 400mg/dL.
-If the foal is more than 12 hours old when failure of passive transfer is suspected or diagnosed an intravenous plasma transfusion is indicated.

Dystocia
-Postural abnormalities of the foal are the most common fetal cause of dystocia. ---
-Because a live fetus plays an active role in positioning itself for delivery, deviation from normal suggests a weak, abnormal or dead fetus. The most common abnormalities are retention of one or both forelimbs at the carpus and lateral or ventral retention of the head. Epidural anesthesia can be used to relieve severe straining for repositioning.
-Uterine torsion is the cause of about 5-10% of serious dystocia in the mare and is rare due to the dorsally attached broad ligaments. Usually counterclockwise. Clockwise direction may result in uterine rupture and the fetus being found in the abdominal cavity. Surgery treatment of choice.

Foaling while standing
-Maintaining a dark, quiet area may convince a nervous mare to lie down
-If it becomes evident the mare will not lay down foal should be supported to prevent injury and to keep the umbilical cord intact for several minutes, if possible to allow passage of blood into foal.

Retained placenta
-Placenta normally passed within 1-1 ½ hours of foaling.
-Retention past 3 hours is considered abnormal. Bacterial contamination is highly likely leading to possible endotoxemia, septicemia and laminitis if not treated.
-Tie protruding remnants in a knot above mare hocks.

Red bag
-Premature chorioallantoic separation and the failure of the membrane to rupture. –
-Emergency- foal must be delivered immediately or will become oxygen deprived.