Horse Owner Guide to Foaling and Foal Care

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Diplomate ACT

FOALING AND FOAL CARE

Key concepts for success:
› Breeding farm personnel are encouraged to communicate with their veterinarians
  › In preparation of the breeding season
  › What to do in emergency situations
  › Care of the mare and foal
  › Foaling kit – what to have on hand
› Develop a list of ‘talking points’ to cover important topics

CALCULATION OF THE DUE DATE

› Duration of pregnancy is approximately 340 days (range 320-360 days)
› Due date can be calculated by subtracting 25 days from the ovulation date or last breeding date
› Example:
  ◦ Last breeding date        April 30, 2013
  ◦ Due date                  April 5, 2014
**Calculation Of The Due Date**

- Accuracy of the due date is highly dependent on the accuracy of the breeding or ovulation date.
- Determination of an accurate due date is difficult for pasture bred mares.

**HOUSING AND MANAGEMENT**

- Avoid unnecessary transport.
- Move to site of foaling *at least* 7-14 days prior to due date; ≥ 30 days may be optimal.
  - Allows acclimation to new environment.
  - Mares begin to develop immunity to local pathogenic organisms.
  - Antibodies will be passed to foal in colostrum.

**FOALING STALL**

- Stall prior to set-up for foaling.
- Stall after set-up for foaling.
Bacterial placentitis is the #1 cause of abortion in mares.
- Placentitis can be detected by ultrasound.
- Treatment can be effective in prevention of abortion and delivery of a live foal.

**SCREENING FOR PLACENTITIS**

- Normal Placental Exam (CTUP)

- Thickened Placenta

- Normal Placental Exam (CTUP)
**SCREENING FOR PLACENTITIS**

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**SCREENING FOR PLACENTITIS**

- Placental Separation from Uterus

**VACCINATION OF PREGNANT MARE**

- 4 weeks prior to due date
  - 4-way vaccine – Tetanus, EEE, WEE, Influenza
  - West Nile Virus
  - Rabies
- Additional vaccines may be administered at that time based on geographic location, potential for exposure and medical risk
  - Strangles, botulism, rotavirus, clostridium, Potomac horse fever
  - www.AAEP.org/owners/guidelines/vaccination_guidelines
CASLICK MANAGEMENT

- Check pregnant mare for presence of a Caslick
- Caslick should be opened 7-14 days prior to due date (or sooner if needed)

CASLICK MANAGEMENT

- Failure to open a Caslick fully can result in severe injury to the perineum

PRE-FOALING EVALUATION

**Procedures:**

- Prediction of foaling
  - Physical examination of the mare
  - Waxing
  - Relaxation of the perineum/vulva
- Milk calcium testing
- Labor alert devices
Calcium increases in milk as foaling approaches. Calcium levels above 200 ppm indicate that the mare has a high probability of foaling within 48 hours.

**PREDICTION OF FOALING**

- Test strip evaluated for color change in any of the 5 test squares.
- Titration of calcium levels.
- When color changes to blue, scale on glass chamber indicates CaCO$_3$ level.

**MILK CALCIUM TEST KITS**

- **Predict-A-Foal®**:
  - Test strip evaluated for color change in any of the 5 test squares.

- **FoalWatch®**:
  - Titration of calcium levels.
  - When color changes to blue, scale on glass chamber indicates CaCO$_3$ level.
**pH – Prediction of Foaling**

- Milk pH decreases prior to foaling.
- Drops from ≥ 7.0 to ≤ 6.4.
- pH meter or pH paper can be used.

**LABOR-ALERT DEVICES**

**Foalert®**
- Transmitter sutured to vulva.
- Separation of vulva lips at foaling pulls magnet out of transmitter.
- Alarm sent to receiver.
- Activates cell phone.
- Main advantage:
  - Daytime foaling mares.

**VIDEO MONITORS**

- Closed circuit television or video systems.
- Can be linked to internet and monitored:
  - Via computer:
    - At work
    - At home
  - Via cell phone.
VIDEO MONITORS

- New Web Cam System

How to keep track of everything

www.foalcare.com

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Kitty

Mare Healthcare Scheduling Calendar:

- **Breeding should follow usual procedures for mares in estrus.**
- **Breeding occurred on:**
  - [Date]

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>5/15/11</td>
<td>Ovulatory (Penogen Phallic)</td>
</tr>
<tr>
<td>5/20/11</td>
<td>Estrous (Penogen Phallic)</td>
</tr>
<tr>
<td>6/2/20/11</td>
<td>Foal birth</td>
</tr>
<tr>
<td>8/2/20/11</td>
<td>Ultrasound to confirm pregnancy</td>
</tr>
<tr>
<td>7/2/20/11</td>
<td>Ultrasound to confirm mare pregnancy and non-pregnant</td>
</tr>
<tr>
<td>8/17/20/11</td>
<td>Ultrasound for barn cleaning</td>
</tr>
</tbody>
</table>

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CONTROL OF FOALING

- Fetus initiates foaling process
- Foaling triggered when fetus is physiologically ready to survive outside the uterus

STAGE I OF LABOR

Clinical Signs:
- Restlessness
- Frequent lying downing and standing
- Pawing at ground
- Patchy sweating
- Actively running or squirting milk
- 1 to 4 hours duration
STAGE I OF LABOR

Fetal Movement:
- Head and forelimbs extend
- Body rotates into dorsal position

STAGE II OF LABOR

Clinical Signs:
- Active labor
- Strong contractions
- Appearance of amnion
- Birth of foal
- 10 to 20* minutes duration
- Delay in delivery increases risk of fetal or neonatal death
STAGE III OF LABOR

- Placenta is passed in 15 min – 3 hrs
- Average time is 1.5 hours
- Placenta is considered abnormally retained after 3 hours

DYSTOCIA

- Refers to an abnormal or difficult birth
- Stage II of labor > 30 minutes
- Incidence is 4-8% of all births in horses
- Most prevalent in maiden mares
CAUSES OF DYSTOCIA

Maternal Causes:
- Uterine inertia
- Narrowing of birth canal (i.e. pelvic fracture)
- Less common

Fetal Causes:
- Abnormal orientation of fetus (i.e. how the fetus lines up in birth canal)*
- Developmental abnormalities
- Dead or sick foals
- More common

BIRTH CANAL: MARE vs COW

NORMAL ORIENTATION
Frontwards, right side up, limbs and head extended
BACKWARDS PRESENTATION

NECK FLEXED TO RIGHT (HEAD BACK)

LEFT FORELIMB FLEXED AT KNEE (CARPUS)
Key components:

- Training
  - Especially for on-site foaling attendant
- Experience
- Preparation
  - Equipment, supplies
  - Emergency plan*

Emergency Plan:

- Each farm should have their own tailored plan
- Relevant factors:
  - Experience and availability of farm personnel
  - Availability and proximity of veterinary services
- Know limitations of personnel
- Understand the situation
- Call for assistance if in doubt

WHEN TO CALL FOR ASSISTANCE

- If there has been no progress toward delivery by 15 - 20 minutes after ‘water breaks’
- Progress abruptly stops
- If the mare becomes painful or shocky
- If you detect a significant problem*
- If you are unsure of the issue
- If you do not have the knowledge or ability to diagnose or correct the problem
<table>
<thead>
<tr>
<th>Level</th>
<th>Management Difficulty</th>
<th>Foaling Complication or Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mild</td>
<td>Elbow lock</td>
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<tr>
<td></td>
<td></td>
<td>Upside-down foal</td>
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<tr>
<td></td>
<td></td>
<td>Backwards foal</td>
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<tr>
<td></td>
<td></td>
<td>Uterine inertia</td>
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<tr>
<td></td>
<td></td>
<td>'Red-bag' (Premature placental separation)</td>
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<tr>
<td>2</td>
<td>Moderate</td>
<td>Front Leg(s) flexed at the knee (carpus)</td>
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<tr>
<td></td>
<td></td>
<td>Neck flexed ventrally, muzzle below pelvic brim</td>
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<tr>
<td></td>
<td></td>
<td>'Hip-lock'</td>
</tr>
<tr>
<td>3</td>
<td>Difficult</td>
<td>Front leg(s) flexed at shoulder</td>
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<tr>
<td></td>
<td></td>
<td>Neck flexed to side; muzzle not reachable</td>
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<tr>
<td></td>
<td></td>
<td>'Breech' presentation</td>
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<tr>
<td></td>
<td></td>
<td>Transverse presentation</td>
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<tr>
<td></td>
<td></td>
<td>Twins (when both entering birth canal simultaneously)</td>
</tr>
</tbody>
</table>

**ASSISTING DELIVERY**

- **Orientation**
  - Frontward presentation
  - Right side up
  - Both front feet and muzzle visible
  - One leg protrudes more

- **Problem**
  - Uterine contractions do not advance one leg
  - Elbow ‘caught’ on pelvis

**‘ON-FARM’ OBSTETRICS: ELBOW LOCK**
ELBOW LOCK

- 'On-Farm' Obstetrics
  - When mare relaxes between contractions, pull on retained limb
  - One should feel a 'pop' when the elbow is freed
  - Foal usually delivered unassisted with subsequent contractions
  - Provide assistance only if needed

DYSTOCIA: Lack of Progress

DYSTOCIA: Assist (Standing Delivery)
**‘ON-FARM’ OBSTETRICS: RED-BAG**

- **Orientation**
  - Usually normal frontward presentation
  - Brick red, velvety membrane protrudes through vulva

- **Problem**
  - Failure to rupture outer placental membrane
  - Premature placental separation
  - Foal at high risk of hypoxemia

**‘RED-BAG’**

- ‘On-Farm’ Obstetrics
  - Emergency situation
    - Call for farm assistance
  - Rupture membrane immediately (knife, etc.), which will 'break her water' (allantoic fluid exits)
  - Assist with delivery
    - Use guidelines* to assist
    - Have oxygen available for supplementation

**ADVANCED OBSTETRICAL PROCEDURES**

**Delivery Options:**

- Vaginal delivery with mare awake
- Vaginal delivery with mare under general anesthesia
- Cesarean section surgery
- Fetotomy
MARE UNDER GENERAL ANESTHESIA

POST-FOALING TOPICS

- Care of the newborn foal
  - A-B-C Guidelines
  - 1-2-3 Rule
- Colostrum evaluation
  - Quality testing
  - Colostrum bank (frozen)
- Navel care
- Enema administration
- Foal IgG tests
- Placenta
  - Retained Placenta
  - Placental Evaluation

1-2-3 Rule for Newborn Foals

1 - Stand by one hour
   - 58 minutes (average time to stand)
2 - Nurse by two hours
   - 142 minutes (average time to first nurse)
3 - Pass meconium by three hours
   - 86 minutes (average time to pass meconium)
BIRTH RESUSCITATION

- Training
  - Indications for resuscitation

- Preparation

- Equipment
  - Resuscitation device with nose cone
  - Oxygen tank (E-tank), regulator and tubing
  - Aspiration device
  - Foal resuscitation guideline chart

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FOAL RESUSCITATION GUIDELINES

- Arrival
  - Resuscitation from one expert person helps

- Breathing
  - Administering head-to-chest position

- Circulation
  - Foal resuscitation

- Timers
  - Infant heart rate

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OXYGEN SUPPLEMENTATION

**Equipment:**
- Portable ‘E-tank'
- Regulator valve
- Tubing
- Nasal adaptor
- 8 - 10 liters of O₂/min flow rate
COLOSTRUM EVALUATION

Equine Colostrum Refractometer
- Add one drop of colostrum onto prism
- Close prism cover
- Read % score
- Equine interpretation scale

Clinical Relevance:
- Prediction of success of passive transfer of maternal antibodies even before foal has nursed
- Allows for early treatment (oral supplementation)
- Critical for colostrum banking (frozen colostrum)

COLOSTRUM BANK

Technique:
- Evaluate quality of colostrum
- Collect 250 mls (8 ounces)
- Strain through gauze or cheesecloth
- Pour into labeled plastic bottle
- Freeze
  - 1 to 2 year storage life
COLOSTRUM BANK

Thawing:
- Thaw bottle in warm water
  - Do not microwave
- Administer thawed colostrum to foals at-risk of FPT
- Volume dependent on risk and mare status
  - 1 quart needed for complete colostrum replacement
  - 8 to 16 ounces for partial supplementation

UMBILICAL STUMP TREATMENT

Clinical Relevance:
- Infectious agents may enter the foal through the open umbilical stump
- Repeated application of an antiseptic agent can reduce the incidence of 'navel ill'
- Chlorhexadine solution (1:1)
- 3 times per day for 3 days

MECONIUM IMPACTION

- Meconium should be passed within 3 hours after birth
- Foals with meconium impactions are painful and strain to defecate
- Secondary issues:
  - Failure of passive transfer (affected foals nurse less often)
  - Sepsis (due to bacterial translocation across inflamed intestine)
MECONIUM IMPACTION

Management Strategies:
- Prevention or treatment of meconium impaction
- Sodium phosphate enemas most common
- Options:
  - Routine treatment of all foals
  - Only administered to foals that cannot pass meconium on their own

Acetylcysteine Enema
- Administered by veterinarians to foals with refractory meconium impactions
- Contains acetylcysteine and sodium bicarbonate
- Mix with water in enema bottle
MECONIUM IMPACTION

- Administered into rectum through a Foley catheter
- Clamp catheter
- Allow to stay for 15 minutes
- Remove catheter
- Breaks up meconium

TESTING FOR PASSIVE TRANSFER

- Measure IgG level in the serum of the foal to verify the extent of passive antibody transfer
- Options:
  - 12 hrs (transfer not complete)
  - 24-36+ hrs (transfer complete)
- Advantages of early testing
  - Oral IgG supplementation is still an option
    - Frozen-thawed colostrum (or other IgG source)

TESTING FOR PASSIVE TRANSFER

Techniques:
- SNAP® test
  - Field test
- ARS IgG Test
  - Quantitative test
Interpretation (all foal IgG tets):

<table>
<thead>
<tr>
<th>Concentration (mg/dl)</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>Excellent</td>
</tr>
<tr>
<td>400</td>
<td>Adequate</td>
</tr>
<tr>
<td>200-400</td>
<td>Inadequate (FPT)</td>
</tr>
<tr>
<td>&lt; 200</td>
<td>Complete FPT</td>
</tr>
</tbody>
</table>

PLACENTAL EVALUATION

Importance:
- Offers insight to in utero environment and health of newborn foal
- Critical to health of postpartum mare
- Passed within 3 hrs

PLACENTAL EVALUATION

Chorioallantoic Membrane:
- Chorionic surface
  - Brick red
  - 'velvety'
- Allantoic surface
  - Pink, smooth
  - Prominent blood vessels
- Cervical Star
PLACENTAL EVALUATION

Is Entire Placenta Present:
› If a piece of placenta is *missing*, it will be the tip of the non-pregnant horn

PLACENTAL EVALUATION

Consult with your Vet:
› If the placenta is retained
› If a piece is missing
› If the cervical star area is abnormal
› If the placenta is excessively heavy
› If you are at all unsure if there is a problem

Keys to Successful Foaling Season:
› Owner/attendant education
  ◦ Hands-on training
› Communication with your veterinarian
› Preparation
  ◦ Foaling kit
  ◦ ‘Birth Resuscitation’ kit
› Emergency Plan