11 hour-old colt

History of dystocia
- Labor approximately two hours
- Veterinarian arrived
- Correct the dystocia quickly

Born at 11:00 a.m.
- Weak and unable to stand
- Fed colostrum
- Treated with DMSO
- Referred

Arrived in the front of a stock trailer
- Very wet, cold, minimally responsive

Case 1

Physical examination
- Temperature 95.6 F
- Ice cold legs, no peripheral pulses
- Severe entropion with sunken eyes
- Mucous membranes
  - Pale and muddy
  - Splotchy areas of hyperemia
- No oral, aural, or scleral hemorrhages
- Blood pressure low
  - Could not obtain ABG
  - Could not measure BP

Case 1
Admission blood work

WBC	6.7	Na	142
Segs	20%	K	3.8
Bands	0%	Cl	96
Lymphs	80%	Ca	8.97
Fibrinogen	224	Glucose	41
PCV	38%	IgG	< 200
TP	5.8		

Case1

You decide the foal is in septic shock

Name 3 findings from PE that support the diagnosis of shock:

Name 2 laboratory findings that support the diagnosis of sepsis:

Name 3 things you would do to treat the shock:

Case 1

After your initial treatment

- His legs began to warm

Now you would like to treat the suspected septic origin of the shock.

Name 2 ways you could do this.

Case 1

You decide to treat the hypoglycemia

- By placing the foal on a 10% dextrose solution
- The foal weighs 111 lbs on admission

What is a reasonable initial fluid rate

- which would deliver enough dextrose to equal what is usual produced by the neonatal liver?

Would this result in enough fluids to meet maintenance fluid need for this foal?

Case 1

111 lbs = 50 kg

4 – 8 mg/kg/min

- 4 mg X 50 kg = 200 mg/min
- 200 mg/min X 60 min = 12000 mg/hr
- 10% dextrose = 100 mg/ml
- 12000 mg/hr / 100mg/ml = 120 ml/hr

Case 1

111 lbs = 50 kg

- 10 kg - 100 ml/kg/day = 1000 ml
- 10 kg - 50 ml/kg/day = 500 ml
- 30 kg - 25 ml/kg/day = 750 ml
- Total/Day = 2250 ml
- 94 ml/hr

Case 1

His initial ABG:

- On INO_2 4 lpm

pH	7.188
$Paco_2$	57.2 torr
Pao_2	73.2 torr
HCO_3	22.5
BE	- 6.1
O_2 Saturation	92.2%
O_2 Content	14.7

Case 1

By 1:30 a.m. the foal's lungs began to sound moist and his arterial blood gas had deteriorated.

Case 1

pH = 7.253
Pco2 = 68
Po2 = 38
SAT = 47
Cont = 8.0
HCO3 = 30
BE = 2.2
INO2 = 10 lpm

Case 1

The foal was placed on a ventilator with an Fio_2 = 1.0.

Case 1

pH = 7.196
Pco2 = 63
Po2 = 75
SAT = 87
Cont = 10.8
HCO3 = 25
BE = - 3

Case 1

The foal was placed on NO at 26 ppm in the inhaled gas.

Case 1

The foal became hypotensive
- S43/D22 M26 and HR = 80 bpm
- Urine production < 10% of that expected

His hypotension was treated with IV methylene blue
- Block local NO production
- NO produces hypotension in septic shock

Resulted in a transient but dramatic increase in blood pressure
- S126/D61 M74 and HR = 94
- Despite this, the foal became anuric. Why?

Case 1

BP began to fall again within 2 hours

Developed pulmonary edema

- Fluid began to appear in the endotracheal tube

Difficult to measure BP

Developed progressive abdominal distention

Despite our intensive efforts

- Not responding to therapy
- Euthanized

Case 2

17 hour old filly

Born at 4:00 a.m.

- 345 days gestation
- Placenta was normal
- Delivery was fast

The foal never suckled the mare

Contracted left hind fetlock

Case 2

By 8:00 a.m.

- Not nursing
- Able to stand in front but not behind
- Began to suckle from a bottle but never vigorously

During the day

- Foal became weaker
- Required tube feeding

Case 2

Arrived down in the van but quite active

Oral mm were splotchy, muddy

You decide to place the foal on INO_2

- ❖Before completing your PE
- ❖Because of the mucous membranes

What flow rate of O_2 would you begin on?

Case 2

After beginning the INO2

- ❖ Oral mm turn pink with large vessel injection

There are no oral, scleral or aural petechia

Labored breathing

- ❖ Respiratory rate 48
- ❖ Only mild nostril flare
- ❖ No abnormal lung sounds

Good borborygmi

Umbilicus is normal

Case 2

Temperature of 100.4° F, HR of 78 bpm

Weighed 111 lbs.

Thin

Normal hair coat

Good ear cartilage development

No excessive joint laxity

- ❖Left hind fetlock moderately contracted

Case 2

Good peripheral pulses
Feet and ears are warm
BP 80/43 (51)
Periods alert and aware
Periods of deep sleep
Stands with little assistance
- < 5 min. supporting herself well
- Knuckles on left hind fetlock

Case 2

Initial laboratory analysis:

WBC	1,440	Na	136.7 meq/l
Segs	55%	K	3.35 meq/l
Bands	3%	Cl	97 meq/l
Lymphs	41%	Cr	1.34 mg/dl
Monos	1%	Glucose	138 mg/dl
Fibrinogen	341	IgG	400 mg/dl

Case 2

What does the WBC and fibrinogen tell you?
How can you tell this problem began *in utero*?
What does the IgG level tell you?
Name 2 ways you could try to correct the problem indicated by the IgG level?
How can you tell if the treatment you chose worked?

Case 2
The next morning

- Foal's attitude improved
- Appeared to be doing well
- You have been giving her intravenous dextrose overnight
  - ❖Now you want to begin enteral feeding
  - ❖No meaningful suckle
- How can you feed her enterally?

Case 2

- Begin with 10% body weight
- How much should you feed the foal every 2 hours to reach this goal?
- How many kcals/kg will this provide?
- Name 2 ways you could treat the hind leg fetlock contracture.

Case 2

- First few days of hospital stay
  - ❖Improved attitude and strength
  - ❖Periods of normal activity
  - ❖Very responsive to surroundings
  - ❖No suckle
  - ❖Very active search
  - ❖Only a licking motion with her tongue
  - ❖Never meaningfully suckled

Case 2
Hospital day 4

WBC
- Increased to normal range
- On day 4 decreased to 2,340/µl

Fibrinogen slowly increased
- Peak of 479 mg/dl

Fed 20% of her body weight

How many kcal/kg/day is she being fed?

Healthy foals usually gain weight at this level of nutrition. But, there was no weight gain on this level of nutrition. Why not?

Case 2
Hospital day 6

Gained weight

Contracture was improving

She still had no meaningful suckle response
- She used her tongue quite well

Case 2
Hospital day 8

Filly nursed off the mare several times

Appeared to be suckling getting some milk

Next day
- She only lick and could not nurse effectively

Case 2
Hospital day 13 - 22

By hospital Day 13

- She had perfected the art of sucking on her own tongue
- She had no tongue curl
- Not suckle objects
- Suckle with tongue out the side of mouth
- Could not coordinate sucking activity

Hospital Day 18

- Finally began to nurse off the mare

Discharged on Hospital Day 22

Case 2

Many of this foal's signs

- Can be explained by NE and sepsis

Name 2 signs consistent with NE

Name 3 signs consistent with sepsis