



Longevity for the performance horse

Meg Sleeper VMD, ACVIM (Cardiology)

Associate Professor, Section of Cardiology
Cardiology Section Chief
Department of Clinical Studies- Philadelphia
University of Pennsylvania School of Veterinary Medicine
3900 Delancey Street
Philadelphia, PA 19104

Outline

- Basic exercise physiology
- Basic conditioning principles
- Building an athlete



Exercise Physiology

- Muscle types
 - ◆ Slow twitch
 - ◆ Fast twitch
 - ◆ Fast twice high oxidative
- Slow twitch muscle cells are preferentially recruited for slow work and fast twitch cells are preferentially recruited for strenuous or fast work
- Depending on the work load, slow twitch cells can turn into fast twitch cells and vice versa



Cardiovascular Physiology

- At rest
 - ◆ Blood volume is @ 9% of body weight
- Plasma volume is 16 to 30 liters
- Exercising
 - ◆ Stroke volume increases by 20-50% with submaximal exercise
 - ◆ Redistribution of blood flow: 35X to 75X increase to working skeletal muscle
 - ◆ Decreased blood flow to GI and spleen



Cardiovascular Physiology

- With conditioning
 - ◆ Stroke volume increases and is often >1 liter (at maximal heart rate, cardiac output is @ 300 liters/min)
 - ◆ Increased heart mass
 - ◆ Resting heart rate does not appear to change (unlike in humans)
 - ◆ Plasma volume increases



Physiologic changes with endurance activity

- Traditionally endurance, competitive trail riding, and most show horses have been considered to be working in the aerobic range while race horses and event horses (during cross country phase) work in the anaerobic range
 - ◆ Aerobic work is lower intensity whereas anaerobic work is high intensity and results in accumulation of lactic acid
- Little lactic acid accumulation unless speed faster than 300m/min is sustained (11.2 mph or 18 kph)
- In reality many endurance horses are exceeding the anerobic limit at least some portion of the ride



Deb Bennet



■ Horses reach physical maturity at 6 years

- ◆ Growth plates in the spine fuse last

■ Quotes:

- ◆ “Productive “riding” has to be much less about saddle-time, mechanics and technique and more about relationship.”
- ◆ “Many people today-at least in our privileged country- do not realize how hard you can actually work a mature horse-which is very, very hard. But before you can do that without significantly damaging the animal, you have to wait for him to mature, which means waiting until he is four to six years old before asking him to carry you on his back.”

Building an athlete: basic principles

- ◆ Time for remodeling tissues
- ◆ Specificity in training
- ◆ Long slow distance
- ◆ Resistance exercise
- ◆ Cross training
- ◆ Interval training



Tissue remodeling

- Denser tissue requires more time to fully strengthen compared to soft tissues
 - ◆ Bone: 18 to 24 months
 - ◆ Tendon/ligament: 12-18 months
 - ◆ Muscle: 2-3 months



Specificity in training

- Law of specificity
- Maximize the possibility of getting precisely what you ask for at competition if you practice getting it during training.



Long slow distance

- Short, slow distance to long, slow distance
- 1 to 2 years prior to speed
- Long slow distance may = competition
 - ◆ 6-7 mph; 4-5 days per week
 - ◆ Eurocisers



Resistance Exercise

- Supplement event-specific exercise
- Causes more muscle cells to fire at one time
- Example:
 - ◆ A horse can run up a hill slower while firing just as many muscle cells as it would running on the flat
 - ◆ Swimming or sand training



Interval training



- A series of medium to intense bouts of exercise separated by short, partial recovery rest periods
- Used since the 1950s in human exercise training
- Classically used in race horses (eventing and endurance)
- Classic TB race horse example:
 - 1 ½ mile warm up
 - 3, 1 mile heats with 10 minutes of cool down between
 - warm down for last mile

Basic conditioning principles



- Increase speed OR distance work
- Use tools to modify the best program for your individual horse and goals
- Prepare for specific variables of your competition
 - Examples
 - Condition during heat and humidity
 - Condition while blanketed if you live in a cooler or arid region

Cross training

- Cavaletti
- Gymnastics
- Jumping
- Dressage
- Team penning



Suppling/schooling exercises

- “Dressage”
 - Leg yielding
 - Shoulder in; haunches in
 - Turn on the forehand; turn on the haunches
 - Backing
 - Counter canter



Basic Horsemanship

- Nutrition
- Hoof care
- Basic health care
 - Vaccination, deworming, dental care
- Daily care and monitoring
- Riding lessons



Daily monitoring

- Excellent horsemanship
 - Know your horse's body better than your own
 - Completely examine your horse daily
 - Any heat, swelling, sensitivity is a sign that should be addressed or it will "snowball"
 - Monitor for change in appetite or weight loss



After the event

■ Immediately post ride

- ◆ Monitor your horse
- ◆ Ensure sufficiently cooled and recovered
- ◆ Walk, graze, feed
- ◆ Treatment?

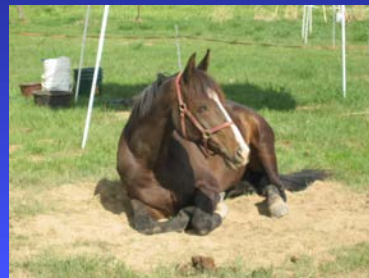
■ Week after the ride

- ◆ Rest with turn out
- ◆ When to return to work?



Ride 'em and rest 'em

- Rest time for recovery is critical to maintain soundness.
- Studies suggest cardiovascular conditioning is maintained in the horse for at least 4 weeks.



Questions?

