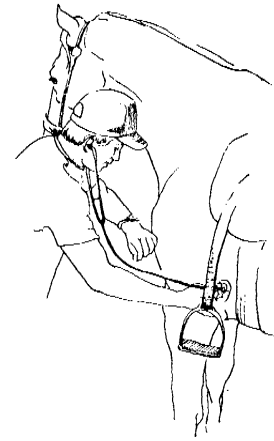




# Guidelines for Judging AERC Endurance Competitions



Revised November, 2008

AERC Control Judge Handbook  
3.0 Rev. 11/08

## PREFACE

The rapid expansion of distance riding throughout the world requires an ever-increasing number of qualified control judges. This handbook serves as a guideline for the effective control of endurance competitions. Only the broadest principles are stated and more detailed information can be obtained from a member of the AERC Veterinary Committee. Call the AERC office (866-271-AERC), visit [www.aerc.org](http://www.aerc.org), or see a copy of *Endurance News* for the list of current Veterinary Committee members.

## INTRODUCTION

The purpose for knowledgeable control judge guidance is to ensure the health and welfare of the horses competing in endurance rides. The level of metabolic and physical stress is high and the rider must learn to read his/her horse to reach optimal performance for that horse on that day. During the course of a ride, the control judge sees the horse only periodically. Therefore, the responsibility of the horse's welfare and performance clearly remains with the rider.

The rules of this sport are ever evolving to allow for a competition that is fair and consistent for horses and riders at all AERC rides. These Guidelines for Judging AERC Endurance Competitions have been developed by experienced and knowledgeable endurance control judges. It is the duty of every control judge to know the rules to the best of his/her ability and to consider the medical safety and health of the horse participants. The arrangement of personnel and supplies for medical treatment or a referral system for medical treatment and the dissemination of this information to riders is the responsibility of ride management working in consultation with the head control judge.

The ride control judge should understand all of the AERC rules. Read, review, and reacquaint yourself with all rules and these guidelines prior to taking on this responsibility. These guidelines may be superseded by any rule changes made by AERC. (Please refer to the most current AERC Rule Book). We have made an effort to make these guidelines readable and understandable and they have been prepared to provide assistance to the ride control judges. They are not standards of care or conduct. Common sense and good clinical judgment must prevail in each situation. Factors such as ride location, space, time and manpower, as well as trail and environmental conditions, may demand different practices. Realize that at times it is difficult to differentiate between a horse that is tired and needs to cease work versus one that is in serious metabolic trouble and needs aggressive treatment.

As control judges, it is our duty to note clinical signs of metabolic or mechanical distress and to refer those horses in need of diagnostics and treatment to appropriate personnel. As control judges, we are not employed to be providing diagnostic or treatment services. Guidelines for diagnostic and treatment principles are included in this handbook to assist those control judges who choose to provide these veterinary services in addition to their duties as control judges. Attempting to follow these guidelines will help to protect the well being of endurance horses. Thank you for your time and effort in making our sport the best that it can be.

2008 AERC Veterinary Committee

### **Control Judge: A Definition**

Control judges are persons that have graduated with a Degree in Veterinary Medicine from an institution of recognized standing. A control judge will provide judgment as to an equine's ability to remain in competition. Control judges are not to provide a diagnosis and will refer equines identified as requiring diagnostics to a veterinarian legally licensed to practice. A control judge who is also a veterinarian legally licensed to practice may perform concurrent duties outside the role of control judge such as providing a diagnosis and/or medical treatment.

## **CONTROL JUDGING GUIDELINES**

### **Qualifications**

Control judges should systematically qualify themselves for endurance judging. This implies not only extensive self-preparation and evaluation for those who have never been involved in this professional activity but also the constant updating and reevaluation of one's skills from time to time.

**Familiarization:** It is not advisable for a control judge to undertake endurance judging without any previous acquaintance with the sport. If you are invited to judge and have never done so, try to familiarize yourself through literature, becoming AERC certified through the open-book exam process, discussions with other control judges or by observation or providing assistance at other endurance rides. Likewise, if you have been away from the sport for a period of time, it may be beneficial to attend a ride to see if there has been an evolution in judging since you were last active.

**Professional Qualifications:** Control judging of endurance riding requires rapid and critical decision-making based on thorough acquaintance with exercise physiology and pathology. Review the basic and recent literature on that subject.

**Equestrian Qualification:** If you can gain experience as an endurance rider, it will provide a dimension of understanding that is not really obtainable in any other way. If that is not possible it is useful to have had some kind of competitive equestrian experience or at least to have been a casual rider. This may allow you to have a better understanding of a horse's and a rider's problems.

#### **Personal Qualifications**

1. The control judge should be tolerant, objective, firm and fair.
2. The personality should be pleasant, helpful, good-humored, kind and concerned.
3. No alcoholic beverages or recreational drugs should be consumed during the competition. This cannot be too strongly stressed: the credibility of one's judgment in the presence of liquor or drugs is rightfully suspect.

### **Equipment**

The amount of equipment will vary with the circumstances and whether or not you are serving as head control judge, assistant control judge, or sole control judge/treatment veterinarian for judging and treatment. For simple judging, you will require a stethoscope, thermometer, watch with a second reading, and hoof tester.

**Treatment:** As a treatment veterinarian you may be asked to give emergency treatment to horses arriving at your check-point. You should have the appropriate equipment and supplies. (See lists under the section entitled Suggested Equipment and Medications, page 28.) Depending on the venue, the number of control judges available to change roles into a treating veterinarian, and/or the lack of a designated treatment veterinarian, it is strongly recommended that ride management arrange for referrals for veterinary treatment at a local referral facility.

If you are a designated treatment veterinarian for the ride, come equipped for a variety of possible contingencies. Refer to the section entitled Suggested Equipment and Medications, beginning on page 28.

### **Duties**

**Pre-ride planning and briefing:** Prior to the start of the ride, the head control judge, if requested by management, should participate with management in all phases of planning that affect the stress levels which the horses may experience. These include:

layout of the trail, the selection of checkpoints (access and time required) and their staffing (at least two P&R crews per control judge on large rides), the provision of emergency care, as well as access for removal of horses requiring ambulance service. The head control judge sets pulse criteria and length of the holds. Briefing the management, other control judges, treatment veterinarians, the control staff, and the riders on criteria is also the responsibility of the head control judge. Thought and judgment applied here prevent most of the problems that can arise unexpectedly from poor planning. **Control judges must have absolute and complete control over all matters affecting the welfare and safety of horses.**

Taking on the task of being control judge implies a commitment to the horses, riders, and ride management. Your presence at the ride site is required from the start of check-in until one hour after the last horse has safely completed the course. In accordance with AERC rules, at least one control judge must remain at the ride site for at least an hour after the last horse has finished. You should arrange to have emergency coverage for any other professional responsibilities so there is no interference with your duties as a control judge. If all control judges must leave the ride site following an hour after completion of the last horse, ride management should arrange for a local veterinary referral system for horses remaining on site.

## **VETERINARY CONTROL JUDGING AND SAFETY**

Dependent upon ride management's ability to pay and or make arrangements for volunteer help, the following support staff for control judging is considered optimal:

- P&R crews to gather objective data. Good personnel here can halve the control judge's effort and double efficiency
- Marshal to regulate horses, staff, pit crews, spectators and vehicular traffic at control checkpoints and road crossings
- Timers at control checkpoints
- Recorders
- Communications system between officials and between control checkpoints
- Ambulance (transport) for horse casualties
- Treatment veterinarian(s) or arrangements for prompt emergency coverage by a local equine veterinary practice

Desirable:

- Marshal to control pre-ride and post-ride examinations for efficient flow
- Timer assistants
- Extra P&R crews and recorders at busy control checkpoints
- Drivers for each control judge may be recorders, but **MUST** know routes
- Radio network for emergency access
- Trail-sweepers, mounted patrol, drag riders
- Go-fers to run errands and facilitate communications amongst officials

### **Control**

The amount of stress of the competition horse should not exceed a level where metabolic or mechanical damage could occur.

- A pre-ride examination should find and prohibit from the competition horses that are mechanically or metabolically either unsuited or unprepared.
- On-course examinations detect signs of excessive stress rates.
- A post-ride examination qualifies a horse for completion and is a chance to consult about horses with signs of stress, whether metabolic or mechanical. Plans should be made for the continued care of horses at the ride site and/or referring them to a veterinarian of the owner's choice.
- Ongoing inspections in camp assess the safety and suitability of arrangements and care before and after the ride.

**Control of the course** (refer to previous statistics from this ride, if available). As to the route assure that:

- the test is reasonable without undue hazards of mechanical injury or metabolic exhaustion;
- there are sufficiently accessible checkpoints;
- there are a sufficient number of control checkpoints and ample total hold time.

**As to the length of the course**, assure that completion within the time allowed under the circumstances presented is reasonable. Climate, terrain, or altitude must be considered. These conditions increase the stress levels and require careful consideration of the relationship between the length of the course and the time allowed for completion.

**Control of ride:** Work with ride management to change the time of the start or even cancel the ride if weather conditions, terrain, or other conditions such as insufficient control or treatment staff create an unacceptable hazard to the horses' health. This is our responsibility as control judges and is allowed within the rules of AERC.

## **Treatment**

When possible, the control judge should NOT be the primary treatment veterinarian. Even small rides should be encouraged to have a treatment veterinarian available. In large rides, the head control judge should designate which of the control judges will switch to treatment in the event of problems.

Treatment is almost universally a fee-for-service arrangement between the rider and the treating veterinarian. If and when a control judge transitions into the role of a veterinarian providing treatment services, the doctor/client/patient relationship becomes operative. Just as in private practice, medical and treatment records should be kept and, as appropriate, a release or informed consent form should be available. If indicated, the client should be required to sign off that he/she has declined the offered treatment or suggested referral to an offsite veterinary clinic or hospital.

Consider using a hand-held Dictaphone as a good means to make a field medical record. The tape can easily be transcribed at a later, more convenient time. Details of the signs and recommended treatments for various diseases of exertion are provided under the Treatment section, beginning on page 30.

## **“Judge and Jury”**

Management may wish to add adjudication of all disputes to the duties of the control judge. Resist this tendency. Management should handle all complaints and protests relating to the trail markings, timing and all non-control judging matters. Control judgment should be confined to matters relating only to the horses' health and safety.

## **Special Awards**

Unless you have special expertise and the time available outside of your judging or treatment duties, disqualify yourself as a judge for such special awards (breed, trail horse, sportsmanship, etc.) or just refuse to participate. Recognized horsemen or women are usually better qualified and better accepted by the competitors as judges for this kind of award.

## **Agreements**

Get in writing the time and place of the ride, the duration of service, the duties you are to undertake, the assistance that will be provided, and the compensation (expenses reimbursed and amenities included). The time to clarify expectations is not during the ride. Misunderstandings can endanger the horses and create liability issues. Be sure that you make your written agreement with an authorized member of the management team (ride manager, if possible) and have it signed/dated by both of you.

## **Head Control Judge**

Ride management will be securing the services of and be responsible for compensating additional control judges and treatment veterinarians. The control judge and any treatment staff should be mutually acceptable to you and to management so it is a good idea to encourage ride management to consult with you in making these arrangements. However, it is ultimately ride management's responsibility for securing the number of control judges and treatment veterinarians they believe their ride needs or they can afford.

At the discretion of ride management and their knowledge of the course and history of the ride, one control judge per 15 to 25 horses and one treatment veterinarian for 30 to 40 horses are usually recommended. A larger number of control judges is required where the speed or stress level is high or there will be many open control checkpoints at one time due to the layout of the course.

Remind the associate control judges to get signed agreements from the management. Since management will ultimately be re-

sponsible for their care and compensation, the agreement will be with management rather than with you as head control judge.

Establish that management has made arrangements for either 1) a designated treatment veterinarian or 2) control judges that can transitioned into the role of treatment veterinarian or 3) a referral system to a local veterinary facility. In coordination with ride management, get verbal confirmation or a copy of the written agreement between management and the referral veterinary facility that will, if necessary, be used for the ride. Ride management should provide you and competitors with detailed written directions and phone numbers for the referral hospital/clinic. This information should be readily available to all competitors and ride staff at all checkpoints. Establish the qualifications and preparedness of any treatment veterinarian(s) prior to the ride and consult closely with that veterinarian in setting up interaction between the judging and treatment services.

Establish the location and availability of an emergency veterinary referral hospital, and make contact with the veterinarians at that clinic so they are in readiness to admit a sick or injured horse. Get detailed written directions to the clinic as well as appropriate contact phone numbers. Management should have these readily available to members of the control judging and treatment staff to distribute to the owner/rider and driver of the sick horse.

The head control judge sets pulse criteria and length of the holds, and is responsible for briefing the riders about criteria prior to the ride.

### **Associate Control Judge**

As an assistant control judge, be sure you understand the level and limits of your responsibility for decision making. If the decision-making process cannot be arranged to your satisfaction, decline to serve.

### **Treatment Veterinarian**

- Establish how injured or sick horses will be reached, transported, and kept for ongoing treatment.
- Establish an emergency protocol for the riders prior to arrival of help (e.g., stay in one place, go to nearest road, etc.). This should be discussed at the rider briefing.
- Establish who supplies, stores, and distributes the large bulk of materials such as fluids.
- The treatment veterinarian should determine the financial arrangements with ride management. Riders should be informed of financial responsibility for treatment of their horse.
- Veterinary students and trained veterinary technicians under direct supervision of a licensed veterinarian can help in ongoing care. **The responsibility for all medical decisions and choice of treatment options remains in the hands of the treatment veterinarian.**
- Establish a plan for referring a sick or injured horse to a referral veterinary hospital.

### **Combined Judging and Treatment Service**

If this arrangement cannot be avoided, establish the priorities of treatment over judging. If the saving of a horse's life demands your full attention, specify that the ride will have to stop until you can return to control duties. If you must undertake combined duties, provide for bulk supplies to be available at each checkpoint.

### **Preparation**

**Professional Review:** If you are new to endurance judging, or have been away from it for more than a year or two, review the basic and recent literature and discuss recent developments with a member of the AERC Veterinary Committee or comparable colleague.

**Read the Rules:** Read the AERC rules as well as the rules as prepared by ride management. There are many items of local option in establishing and running rides that fall outside the AERC rules. Carry copies of both sets of rules with you while on duty in case you are unavoidably drawn into dispute.

**Examine the course,** at least on topographic maps. When possible, examine representative segments of the trail from the back of a horse or an ATV.

**Draw up a Control Judge Flow Chart for all control judges.** (See sample Control Judge Flow Chart, Appendix C.) Make sure that scheduling allows for the fastest possible arrival at a control checkpoint and the last permissible rider departure time.

Have capable vehicles and knowledgeable drivers to transport control judges. When possible, a control judge should remain at every control check until every horse has departed from the control check. If this is not possible, be certain that a representative of ride management remains, and that communication to open control checks is continued until the last horse has departed.

**Confer with ride management** that they have had all competitors sign and date a release form with an acknowledgement of assumption of the risks associated with endurance riding.

**Prepare for the rider briefing**, with notes to:

- Review the physical signs of stress that establish your rational basis for control procedures and criteria;
- Describe control procedures and criteria and detail the flow patterns through each checkpoint. **Any changes to previously designated criteria must be posted in writing in a location accessible to all riders prior to the start of the ride as well as be mentioned at the rider briefing;**
- Describe the special concerns that you have about the terrain and/or weather in various sections of the trail which you feel should affect the riders' strategy and pacing;
- Describe the post-ride examinations for completion and Best Condition awards.

**On-site before checking in horses:**

- Establish the competence of lay help to carry out assigned functions of taking temperature, pulse and respiration.
- Brief the control judging, veterinary treatment and management staff on pre-ride, control, and post-ride criteria procedures.
- Distribute schedules and assignments to the control judge and treatment veterinary staff.
- Lay out the pre-ride inspection site for efficient assessment of horses.

## Pre-Ride Control Judge Examination

Have management provide marshalling to keep this orderly.

**Principles:** Assess the readiness of every entry to withstand the rigors of this ride. Rigorous screening at this point prevents problems during the ride. Concentrate on the essentials. You are not examining the horse for purchase; you are looking for evidence that the entry may not complete the ride in the time allowed due to metabolic fatigue, mechanical failure, or exterior injury.

Horses showing any degree of lameness should be re-presented for examination by the entire control judge staff, if possible.

**All horses with any degree of lameness should be reviewed by at least two control judges before eliminating the horse from starting.** In rides with excessive numbers of horses, two or three members of the control judge staff should be designated to review questionable horses. Courtesy may suggest an explanation of reasons for elimination and review with the disappointed rider when, and if, time permits.

**Procedure:** Be systematic. **All parameters described on the rider card should be assessed and noted on the card at the pre-ride judging examination, at every subsequent control checkpoint and at the finish line judging examination even if the horse has been eliminated.**

Rectal temperature may be taken by members of the lay staff before each horse is presented for examination.

Evaluate the heart rate and rhythm at rest. Then the horse can be jogged for soundness. If he jogs unsound, ask the rider to return at the end of all the examinations for further evaluation and a decision. Firm, consistent footing is desirable for jogging. In re-examining doubtful entries, detailed palpation, flexion tests, hoof testers, and other diagnostic procedures may help to segregate the innocently sore from the dangerously lame. Examine the heart and lung fields with a stethoscope just as the horse returns from jogging. The rapid decline of the pulse from the slightly elevated rates achieved at the jog will enable you to form an opinion about the quality of the organ as a pump and the rapidity with which it returns to resting rates. It will also enable you to pick up significant irregularities.

Complete the metabolic examination according to the order on the rider card as shown on pages 46 and 47. This has proved to be logical, easy to remember, and representative. If you practice it from the first horse, it will become second nature, and easy to complete rapidly during the ride at the control checks. These largely subjective parameters are best rated A-B-C-D rather than numerically. While not every control judge will draw the distinctions between grades at the same point, every other examiner will know whether the sign was rated (A) superior, (B) acceptable, (C) cause for concern, or (D) unacceptable and cause for elimination. Numerical or descriptive notations are less informative.

Start at the nose and mouth, assessing mucous membranes and capillary refill. Press over the jugular vein for venous refill time. Pinch up a tent of skin on the point of the shoulder; this is a more consistent location than using the side of the neck to assess this indication of dehydration. Any delay is noteworthy; a second or longer is definitely significant. As you move toward the rear, ballote the triceps, glutei and ham muscles for tone and reaction. Palpate the back and loins. Stop and listen to all quadrants for gut sounds which need not be loud or numerous to satisfy but should be present. Step to the rear and lift the tail, evaluating tail muscle and anal sphincter tone. Make a quick tour of the horse for symmetry, for mechanical defects, and interference lesions to estimate obvious liabilities of locomotion.

The trot out should be straight out and back for a sufficient distance and the horse may be circled in each direction to observe that the horse shows no consistent gait aberrations under normal circumstances. Do not use severe maneuvers or flexion tests on this exam. Save these diagnostic procedures for re-evaluation. If the horse jogs sound, the legs can be examined in a cursory fashion. Don't get caught up in minute palpation of the legs. Inspect all limbs for signs of previous significant disease such as a thick joint, tendon or ligament, recent wound or severe interference. If necessary, quickly feel suspicious areas, but avoid deep palpation or strenuous manipulation of the legs. Pick up each foot and check the adequacy and type of shoeing. Similarly review saddle, girth, and bit areas for suspect or overtly painful lesions.

Do not omit a general impression of the horse; assign it an A-B-C-D value on the rider card.

**Disqualification:** The standard to advance at an endurance ride is "fit to continue." This involves all aspects of the horse, i.e., metabolic and/or lameness. It is not always possible to make a definite diagnosis as to lameness, however, it is incumbent upon the control judge to make a subjective evaluation of the horse's gait as to "fit to continue." The AAEP guidelines for lameness as defined below act as an aid in evaluating and determining if a horse is "fit to continue."

Before the ride, horses with Grade III or IV lameness are excused irrespective of cause. Time pressures require judgments to be rapid and critical. However, many times the rider can be held until adequate time is available to better assess a questionable lameness. Horses with Grade II lameness should have the source of their problem identified if possible and a judgment made as to prognosis with work. A rider with a horse with Grade I lameness should be advised of the finding and an effort made to find the potential cause. If a brief examination fails to find any, such horses can usually proceed under careful surveillance. Many will complete the ride in satisfactory order; some will become lame enough to disqualify. Seek a second control judge opinion when possible if considering disqualification of a horse at any time during a competition.

## Lameness

**Definition:** Lameness is a deviation from the normal gait or posture due to pain or mechanical dysfunction.

**Classification:** Approved by The American Association of Equine Practitioners/December 1981

- **Grade I.** Difficult to observe. Not consistently apparent regardless of circumstances (i.e., weight carrying, circling, inclines, hard surface, etc.).
- **Grade II.** Difficult to observe at a walk or trotting a straight line; consistently apparent under certain circumstances (i.e., weight carrying, circling, inclines, hard surface, etc.).
- **Grade III.** Consistently observable at a trot under all circumstances.
- **Grade IV.** Obvious lameness at a walk: marked nodding, hitching, or shortened stride.
- **Grade V.** Minimal weight-bearing in motion and/or at rest; inability to move.

In eliminating horses for condition before the ride, subjective judgment should be applied with caution. Obviously sick horses, coughing horses with or without nasal discharge, major heart murmurs or irregularities are to be held out from competition. Thin, fat, over- or under-trained horses are more difficult to eliminate without just cause; always feel free to express your concern to riders of horses with liabilities, and to order and conduct extra-close surveillance during the ride.

## Rider Briefing

This is the time to establish the relationship between the control staff and the riders and should be undertaken seriously and systematically. Introduce all of the staff assisting in control, review the procedures and, most importantly, the recovery criteria for control. Remind the riders of the following: The control judge team is in partnership with the riders. Rider cards are not to be confused with medical records. The condition of your horse is dynamic and in an endurance ride setting can very quickly change,

regardless of whether at the last checkpoint your horse received good scores. Additionally remind riders that they are the most familiar with their horse, and unlike the control judge, the rider remains in constant contact with their horse throughout the ride. Remind riders to not let any desire to win affect their judgment regarding the well-being of their horse. Finally, remind riders that they, not the control judge, are ultimately responsible for the well-being of their horse.

Discuss the traffic patterns at the various checkpoints and any special areas or features of the trail or conditions of competition that particularly concern you. Discuss the logistics of hauling eliminated horses out of checkpoints back to base camp.

Advise the riders how to handle a horse that becomes seriously tired and/or lame on the trail between control checkpoints. Suggestions include: utilize shade, supply water when possible, cool the horse when possible, walk to nearest designated point. If the horse fails to recover to ride recovery parameters or is too lame to continue at a walk, then **STAY WHERE YOU ARE** until help can be brought to you. Inform passing riders of your situation and location and ask them to relay this information to officials at the next control check.

## Records and Recording

Riders have come to expect a record of their performance; management needs a record for reporting results, tabulating for awards and for adjudicating disputes and protests; control judges need records to provide reference during and after the ride for evaluation of fatigue and gait changes, for control and Best Condition awards. (See sample Rider Card, Appendix D.)

Usually recording assistants, sometimes referred to as control judge secretaries or control judge recorders, are designated by ride management to accompany each control judge. The control judge secretary enters on the appropriate forms all observations and opinions dictated by the control judge. The control judge should demonstrate to the control judge secretary how to enter the data while examining the first few horses.

Riders should retain the original ride card throughout the ride. These cards enable control judges to carefully monitor any change in stress levels between control checks.

## AERC Pull Codes

There are eight pull codes available to define and/or describe why an equine or owner did not complete an endurance or limited distance event.

- L – Lameness
- M – Metabolic
- SF – Surface Factors
- DQ – Disqualification
- OT – Overtime
- RO – Rider Option
- RO-L – Rider Option-Lameness
- RO-M – Rider Option-Metabolic

The **Lameness** code is used when any equine is found to be consistently observably lame by the control judge, generally considered at least a Grade III lameness as defined by the AAEP standards. Where possible it is beneficial and advisable to have two control judges confer on the presence and degree of lameness before retirement of the horse from competition.

The **Metabolic** code is used for a variety of reasons, all pertaining to the equine's ability to cope cardiovascularly and metabolically with the endurance work at hand. Examples of horses not coping well with the stress of endurance competition can be: a failure to recover the heart rate in a timely manner, poor hydration status, excessive tiredness, poor CRI (cardiac recovery) scores, poor gut sounds and potentially even signs of colic, thumps, choking, or heat exhaustion. In general, no one physical exam parameter would require a horse to be eliminated for metabolic reasons and all signs should be considered together.

However, the most important caveat to keep in mind while control judging is the age-old endurance saying of "let the trail sort it out." One can often allow a low grade, inconsistent lameness to continue on. Yet one should **ALWAYS** pull any horse in questionable metabolic condition.

The **Surface Factor** code generally is used for any tack gall, laceration or abrasion evident on the equine that the control

judge deems would render the equine not fit to continue.

**Overtime** codes simply pertain to a rider that has gone overtime either on their total ride time or did not meet one of the published hold cut-off times.

A **Disqualification** code is most often used by ride management for a rule infraction by the rider. Examples would be disqualification for unsportsmanlike conduct on the part of the rider, unruly or unsafe behavior on the equine's part, riding off trail, or any other breaking of a written AERC or specific ride management rule on the part of the rider.

**Rider Option** codes are a whole different subset of pull codes and historically have been the most abused and misunderstood. It is imperative the control judge understands fully that the only way to a Rider Option pull code (no matter which type) is for the equine to have been judged as sound, healthy and "fit to continue."

The **Rider Option** code itself pertains solely to the health of the rider and is used when the rider himself or herself deems they are unable to continue on the ride.

The **Rider Option-Lame** code would be used in a case where the control judge has passed the equine as sound and fit to continue but the owner still feels his or her horse is not right.

Likewise the **Rider Option-Metabolic** code would be used again where the control judge has examined the horse and found the horse to be stable and able to continue but the owner decides in his or her opinion their equine is not up to par or something metabolically is just not right with their animal.

The biggest issue and misuse of the RO pull codes, all three of them, often centers on "who" found the problem with the horse first. Oftentimes a rider notices their horse is obviously lame, or might be failing to recover its heart rate, or is not eating or drinking well. Owners usually present the horse to the control judge with these issues in mind to be discussed and confirmed. Unfortunately riders can become mistakenly angry or hostile when the control judge properly assigns the horse either a Lame or Metabolic code. It has seemed that many riders want some kind of reward for noticing the problem first and feel penalized for not receiving a RO code.

It is imperative that the control judge both understands and explains compassionately and clearly to the rider that it is not of issue "who" noticed a horse's problem first. Rather riders and control judges must be aware that accurate pull codes as to why a horse was or was NOT able to continue on are vital to our greater understanding behind the failure of equines to finish endurance events. If a horse is pulled for unfit to continue reasons, do not succumb to the temptation of allowing a rider to exercise his/her option to pull the horse with a Rider Option code for the sake of their AERC record. This may leave the wrong impression in the event of litigation. Call it what it is. Accurate pull code statistics are a needed and indispensable tool in the greater search for the overall safety of our equine companions in the sport of endurance riding.

## Control

### Entering the Control Checkpoint

- "Gate" into a timed hold (15-60 minutes). This is the commonly used procedure for entering control checkpoints. When entering the control checkpoint, the horse is given an arrival time and it **must meet recovery criteria within 30 minutes of arrival**. The "hold" time designated for that particular checkpoint starts as soon as the horse meets recovery criteria. This method discourages racing into checkpoints at the anaerobic work rates that are contrary to optimal endurance performance. The "gate" tends to group together horses of like ability, and to slow those horses not capable of the pace at which they have been traveling. Most fit horses ridden within their level of ability recover within three to 10 minutes of arrival at the check.
- If pulse recovery parameters are not met at presentation, there may or may not be an additional time required before re-presentation is allowed. If criteria are not met at the second pulse check, then a third check is sometimes permitted with a control judge taking the pulse at that time rather than a P&R volunteer.
- If criteria are met at the initial examination, the rider may go directly to the control judge for the rest of the fitness evaluation. The "gate" concept encourages competitors to compare their horses to other people's horses and to choose the work rate that is most likely to approximate a reasonable goal for each horse.
- During the timed hold, riders and crews can rest and make adjustments to tack and equipment, and if necessary may re-present the horse to the judges for reassessment of "fitness to continue." This enables the judges to monitor progressive recovery, hydration, and lameness within the horse's mandatory hold time.

- The time of the mandatory hold may be extended or shortened during a ride if unexpected weather conditions or control problems arise. This must be modified prior to departure of the first horse at the check so all horses are subject to the exact same restrictions.

## Spot Checks

A horse may be eliminated at any location on trail or in the control checkpoints.

## Principles

- Examine horses regularly and often during the ride (at least two to three times during most 50-milers, five to eight times for 100-milers, with the greater frequencies recommended in difficult terrain or hot, humid weather).
- Recognize fatigue factors promptly and advise the rider how to modify the use and care of the horse to achieve completion. **Remember there are no conditional releases.** Remind yourself that there is no guarantee that the rider will follow your advice.
- Use progressive pulse recovery (to 64 bpm or less) as an indicator of fitness. P&R crews should be available to facilitate taking heart rates. When a horse arrives at a control checkpoint during a ride, it has 30 minutes to meet pulse criteria.
- Evaluate respiration recovery rates; consider the minute volumes of air being moved more than the numerical rate, taking into account the ambient temperature and humidity and the horse's body temperature. Rectal temperature should be less than 103.5°F and should drop within 10 to 20 minutes of stopping exercise.
- **A control judge should perform a complete hands-on exam of every horse.** Carefully examine and auscultate horses that present with poor recovery numbers or signs of fatigue. Use the Cardiac Recovery Index (see below) in conjunction with all other clinical parameters to determine "fitness to continue."

## Criteria

**Pulse:** Pulse recovery with rest has become the main objective measure of "fitness to continue." When examining a horse with questionable parameters, refer to the in-time to see how much time has elapsed since arrival at the control checkpoint. The less stressed horse achieves a pulse of 64 bpm or below within five minutes of rest. A recovery rate of 64 bpm or less within 10 minutes should be expected. A recovery rate of 52-60 bpm within 20 minutes of arrival is a reasonable expectation. The palpable pulse and auscultable heartbeat should be regular and full, not wandering, labile, thin or "slapping." At "gates," if the original criterion for pulse is not met at the first requested check, there may be a time penalty of two to 10 minutes until the horse can be officially checked again. **The horse must recover to criteria within 30 minutes of arrival at the control checkpoint, except at the finish line control checkpoint which allows for up to 60 minutes in endurance rides. Limited distance (LD) rides allow up to 30 minutes to recover at the finish line control checkpoint and this criteria is set at 60 bpm in the rules of AERC.** This criteria for elimination should be discussed at the pre-ride briefing.

**The Cardiac Recovery Index:** The ability of the horse's circulatory system to accommodate the level of exertion experienced at the event is monitored by use of the Cardiac Recovery Index (CRI). The CRI may be performed at all control checkpoints at endurance rides, including the finish line control check. The horse is not presented until it has met recovery criteria established for that ride, usually of 64 bpm or less. The horse is then presented to the control judge, and a resting heart rate is taken. Then the horse is trotted 125 feet out and 125 feet back. (The gait can be observed during the jog out for soundness and impulsion.) At exactly one minute from the time the horse **started** the 250 foot trot out, the heart rate is taken again. Most horses complete the trot out within 25-30 seconds, allowing the horse to stand quietly for the remainder of the minute. (For a horse that does not object to being handled, the control judge can initiate evaluation of the metabolic parameters during the remainder of the minute.) A horse that is demonstrating adequate metabolic compensation should recover to the same resting heart rate taken before the 250 foot trot out, or preferably to a heart rate of four bpm less than the starting rate. If the heart rate elevates during the CRI, the horse should be asked to return for a recheck CRI within 10-15 minutes to monitor for progressive recovery. The control judge should take a second look at all metabolic parameters at that time, including a second CRI. **The CRI is not necessarily used to eliminate a horse from competition; the entire clinical picture is used to assess the ability of a horse to continue in the event.**

**Respiration:** Respiratory recovery varies with the weather conditions. It is the volume of air being moved per minute that is the critical factor. Under normal cooling conditions, the respiratory rate will subside parallel to and below the pulse rate. Since endurance effort produces high body heat and since horses vary in their respiratory response to poor cooling conditions, panting in hot, humid weather can be entirely consistent with optimal performance. If pulse and other signs of recovery are prompt and progressive, panthers with a true core temperature below 103.5°F are merely devoting respiratory effort to further cooling within the physiologic range. Any horse with a rectal temperature above 103.5°F should be closely scrutinized for other fatigue signs and made to reach and maintain cooler temperature to be “fit to continue” on the trail. Some panthers can be recognized before the ride during the pre-ride inspection in hot, humid weather by their tendency to rapid shallow breathing with rates in the 40s or 50s when they are entirely at rest.

**Body Temperature:** At least 70% of the energy of muscle metabolism converts to heat within the working muscles. Horses working near their maximum aerobic rates (and faster) develop elevated body temperatures. Rectal temperatures of 101°-103°F are common and tolerable. Rectal temperatures above 103°F for longer periods can be dangerous. Horses with temperatures above 103.5°F should be subjected to supplementary cooling with water, both at the checkpoints and on the trail provided the horse is deemed “fit to continue.” A horse with a rectal temperature remaining above 103°F for 30 minutes following cessation of exercise and despite external cooling may not be adequately compensating for the heat stress, and so may be deemed not fit to continue.

Take the rectal temperatures of all panthers and horses with poor pulse recoveries. Horses with rectal temperatures greater than 103°F should be subjected to external cooling and rechecked within the 30 minute time frame. A very slow bowel may accompany a high rectal temperature and must be considered when deciding if a horse is “fit to continue.”

**Dehydration:** The persistency of a skin fold **pinched at the point of the shoulder** may indicate body water lost in excess of 3% of the horse’s body weight. The skin pinch on the side of the neck is less reliable as a hydration marker since it is easily influenced by elasticity of the skin and fat content. Increased skin tenting, scant sweat, dry, injected mucous membranes, and sinking of the eyeball with consequent drooping of the upper lid are all signs of dehydration. When several of these abnormal signs are present, dehydration may be complicated or may be “just the tip of the iceberg.” This is the time to start looking carefully for additional elements of fatigue or metabolic failure.

**Capillary Refill and Mucous Membranes:** Lightly blanch a spot on the gum just above an upper tooth with pressure from a thumb or finger. Undue finger pressure results in false information. Time the return of full color to the gum at that spot. Normally this takes one to two seconds. Refill time prolonged past two seconds denotes low blood volume and/or low blood pressure. Poor capillary refill often corroborates findings of dehydration, as do dry, tacky mucous membranes. Muddy or injected mucous membranes or purplish gum margination are reliable indicators of metabolic disease.

**Jugular Refill:** Jugular refill is delayed with falling blood volume and capillary perfusion. Block the vein and estimate how quickly it fills up cranial. Two or three seconds is usual and adequate. Note that horses with slow resting heart rates may give the impression of a delayed jugular refill time.

**Gut Motility:** The diversion of blood from visceral to muscle circulation can cause diminished gut sounds or even a complete ileus. Reduced gut sounds in an apparently healthy horse are of less concern than a horse with absent gut sounds accompanied by other metabolic abnormalities. Both of these horses should be monitored closely and brought back for a re-examination within the hold time following arrival at the control checkpoint. There is no penalty for being cautious and the recheck may also benefit an anxious rider. Hyper-motile gut sounds may be a prelude to an ileus.

**Expression and Behavior:** Sleepy-looking eyes and droopy ears may be related to fatigue. Loss of attentiveness is significant. Loss of appetite is alarming. Loss of thirst in the dehydrated horse is seen with metabolic fatigue and electrolyte imbalances. Since experienced campaigners may stand quietly at rest and possibly alarm an inexperienced observer, it is important to determine which horses have passed a point of safe and reasonable fatigue.

**Impulsion:** The loss of elasticity, power and length of stride are proportional to muscle fatigue and often moderately deteriorate over the course. Electrolyte imbalances, dehydration, or any other physiological disease process such as exertional myopathy, overheating, or glycogen depletion may adversely affect impulsion.

**Gaits:** Lameness on the trail or at a control checkpoint should be evaluated by the same AAEP grading outlined with the pre-ride criteria. Grades I and II can usually “go on” with caution. As in the pre-ride exam, consider the prognosis of the lameness with work. If the athletic future of the horse is threatened then consider disqualifying the horse. Grade III lameness or greater for

any reason should be disqualified at any point at which it is revealed, including on trail and at the finish line control check. The degree of lameness should be determined in a straight out and back trot out before any diagnostics are performed (i.e., flexions, palpation, circling, etc.). Lameness eliminations should be based on a gait where the lameness can be localized to a particular leg(s) and there is a high degree of confidence that it can be blocked out or localized. By applying this “standard,” we can find some commonality as control judges in our gait evaluations and avoid nebulous lameness eliminations.

Interference: Bleeding or tender interference injuries should be carefully assessed for ability to continue. Horses with severe interference wounds are not considered “fit to continue.” Re-shoeing the horse before or during the ride to relieve shoeing errors or interference is at the rider’s discretion.

Equipment rubs and/or discomfort: Severe saddle, girth, or bit injuries should be disqualified if a change in equipment will not relieve them. Improperly fitting saddles can contribute to severe discomfort and lameness and can be a cause for elimination.

**A caution mark.** Sometimes a horse will present with signs that give cause for concern but not disqualification. This entry can be marked for further scrutiny either with livestock marking crayon near the entry number and/or on the rider’s card. The signs of concern are noted on the card and signed by the control judge concerned. The rider is given any special instructions on pace or care to relieve or arrest the problem. Note that there are no conditional releases; a horse is only to be let out of the control checkpoint if he is demonstrating metabolic competence and progressive recovery based on a full exam. If there is any doubt about a horse’s metabolic condition, the horse should be eliminated. **The objective of control judging is to pull the horse showing undue fatigue or lameness rather than waiting until it is overtly sick and in need of treatment.**

A horse exhibiting synchronous diaphragmatic flutter (SDF or “thumps”) is NOT considered “fit to continue.” This is a warning sign of serious fluid and electrolyte derangements. The horse should be disqualified as with any fatigue condition related to failure to recover.

## Completion Examination

The same criteria and procedures that are applied throughout the ride should be applied at the finish line. The post-ride completion exam may be carried out as soon as the horse has finished and reached pulse recovery. This must be accomplished within one hour of crossing the finish line, and rechecks are allowed during the one hour.

A horse should be certified for completion if it:

1. Demonstrates remaining reserves, can safely be ridden further, is capable of “going on,” i.e., is “fit to continue” even if at a reduced speed;
2. Has stable vital signs, and is demonstrating recovery. As with criteria used throughout the ride, the completion criteria is to be set at the discretion of the head control judge. However, a criteria of 68 bpm is the maximum completion pulse criteria set by AERC rules.
3. Has not had nor urgently requires medication or treatment of any kind (see below);
4. Is not lame consistently at the trot on a straight line (Grade III), nor at the walk (Grade IV).

Horses significantly fatigued or needing veterinary care should be listed and kept under control judge observation until they have recovered or are referred to the treatment veterinarian. Any horse that has been treated or medicated prior to the final control check is not eligible for completion. Any rider refusing treatment for a horse that a control judge or treatment veterinarian has advised should be treated shall be denied completion status.

**Note that a horse can be pulled aside at any point or at any time during the event (e.g., at control checkpoints even after “passing” a control judge’s exam, as the horse is leaving the control checkpoint, or along the trail if seen by a passing control judge) and evaluated for questionable soundness and/or metabolic competence.**

## Best Condition Examination

This examination is to select the horse considered the most fit, freshest, and in the soundest condition at the end of the ride. **If no animal is in acceptable condition, the award may be withheld.** The evaluating procedures for Best Condition may be more demanding than the routine control procedures but should be sufficient to discriminate between contenders. The examination is usually performed one hour after the finish but may be at such other time as the management may specify.

### **Guidelines for Control Judges: Judging Best Condition (B.C.)**

1. Horse Judging Definition: It is recognized that there are many ways of defining Best Condition (e.g., against the ideal, against the group examined, against itself, condition throughout the ride, or condition at the time of examination). For the horse judging portion of the score, the definition accepted by AERC is “the horse, at the time of the Best Condition examination, that is in the best condition and deemed most fit to continue . . . ”
2. The actual award is modified to include finishing time and weight factors in addition to the horse judging aspect.
3. It is very important to use the full range of points allowed in each category. If only the upper end of the scale is used, a quite fatigued or lame horse ridden by an exceptionally fast or heavy rider will be the highest scoring horse after factors of weight and time are considered. This is not to minimize factors of weight and time but to prevent the award from going to an unfit or lame horse!
4. Standard: All horses judged for B.C. will be judged against a standard of a well-conditioned, fit, sound and metabolically normal endurance horse. CAUTION: With regard to gait and movement one must consider what is normal for the breed, type, and disposition (animation level).
5. Any horse with a severe abnormality in any category should not be considered for best condition. **Any horse that is Grade III or more at the time of the Best Condition exam cannot be considered for Best Condition judging.**
6. If all horses score “low” using these standards, recognize that it is possible that no horse meets acceptable standards for awarding a B.C. award. **If none of the horses evaluated are worthy (in the opinion of the judging committee) they may elect not to award a Best Condition award.**
7. Consider what is only “showmanship” that serves to “hype” the horse and detracts from evaluating the animal’s true state of ability to continue. Note particularly if the horse’s head is held in such a way as to prevent easy observation of movement.
8. Horses should be evaluated for gait abnormalities, impulsion, etc., prior to any palpation. Avoid excessive pressure when palpating during this exam. Remember that these horses are going to be tired and sensitive following a 50 or 100 mile ride. Undue pressure is unkind.
9. **BE CONSISTENT!**

### **Post-Ride Courtesy and Safety Check**

Between the arrival of the last competitor and the distribution of awards on shorter (<75 miles) rides, there is time to “cruise the camp” to make sure all horses are recovering well, that recommended treatments and care are being administered, and that rider concerns and questions have been answered. Riders appreciate the ongoing concern and assistance offered by the control judges and treatment veterinarians. Problems can develop after the completion/Best Condition examinations. Horses eliminated on the course should be seen again before leaving. Advise riders of eliminated horses that it is their option and responsibility to have the horse rechecked before leaving the ride site and that they are accepting any risks that may be associated with the failure to have a horse rechecked before control judges are discharged after a ride is concluded. Documents of all treatments and recommendations for further care should accompany the horse on their departure from the ride.

### **Ride Debriefing, Critique and Reports**

Management and/or sanctioning bodies may request or require specific commentary on the event and control judging/veterinary treatment service. This may be an oral debriefing, a brief written critique, or a formal report on forms provided for the purpose. Be thorough, frank, and tactful. The evolution and spread of better control judge and veterinary treatment service to the sport of endurance riding needs your thoughtful commentary.

### **Post-Ride Control Judge and Veterinary Treatment Report**

The head control judge should complete the AERC Post-Ride Control Judge and Veterinary Treatment Report and return it to ride management to be submitted to the AERC Office. (See copy of this report, Appendix G.)

The head control judge should make a post-ride evaluation of the ride from a control judge’s standpoint, and present his/her findings to management so that existing problems with trail and control checkpoint logistics can be corrected and improvements implemented.

In the event of an equine death, a complete necropsy should be suggested to the owner. Remind the owner that currently AERC will reimburse the owner for the costs associated with a necropsy up to a dollar limit—check with the AERC office for specific information on this. (See Appendix H for the necropsy protocol.) Understand the emotional distress that is occurring at this time and appreciate that this must be done in a considerate and caring fashion. It is often best if a reasonable period of time be given for emotions to settle before this suggestion is made. The objective in performing a post-mortem exam is to attempt to learn anything that may help to prevent such an occurrence again. Occasionally a necropsy will reveal pre-existing conditions over which no one had any control. If permission is granted, the necropsy should be conducted in an “out of the way” location as possible, in a diligent fashion. It may be helpful to photograph abnormal findings of gross lesions and to submit tissues and blood samples to a lab. If there is reason to believe the cause of death may be challenged or result in litigation, photographs, tissue and blood samples and other relevant studies or tests should be ordered and preserved.

## **THE AERC DRUG RULE**

AERC is resolutely and absolutely opposed to the presence of prohibited substances in horses participating in endurance rides. AERC defines the detection of a prohibited substance or metabolite of a prohibited substance in body tissue or secretions of a horse to be *prima facie* evidence of prohibited substance administration. Riders and owners should note that some prohibited substances may persist in the horse’s body for seven days or more. The owner and rider, if different, are absolute guarantors of the horse’s condition and are subject to disciplinary action, irrespective of demonstrable proof of their knowledge or intent of the administration of a prohibited substance. The control judge should refer to AERC Rule 13 and its appendices for clarifications regarding the drug rule.

The list of prohibited substances and categories of prohibited substances are quite extensive and as such are not included in these guidelines. The list of prohibited substances can be obtained from the AERC office or referenced on the AERC website.

The following substances ARE ALLOWABLE preceding and during competition:

- Vitamins
- Minerals
- Electrolytes administered by syringe or in feed
- Topical agents such as liniments and wound dressings that do not contain a prohibited substance
- Topically applied isopropyl alcohol
- Ice and ice water administered orally and/or topically
- Progesterone and similar acting progestagens such as altrenogest (Regumate) only in mares to control estrus cycles
- The following Chondroprotective agents: glucosamine, chondroitin sulfate, polysulfated glycosaminoglycan, hyaluronate—not to be administered by needle/syringe while competing in an endurance ride
- Acid neutralizers including aluminum hydroxide (Maalox, Neighlox)
- Anthelmintics (dewormers)
- Vaccines and immunostimulants\*

\*There is insufficient information available to advise as to the timing of administration close to the time of competition.

## **SUGGESTED EQUIPMENT AND MEDICATIONS**

### **Suggested List of Equipment for the Control Judge**

1. Guidelines for Judging AERC Endurance Competitions
2. AAEP Guide for Veterinary Service and Judging of Equestrian Events (The Blue Book)
3. AERC Rules and Regulations
4. Stethoscope
5. Watch with second hand
6. Thermometer

Additional suggested list of equipment for the treatment veterinarian:

7. Twitch and/or lip chain

8. Nasogastric tube
9. Stomach pump
10. Bucket
11. IV catheters: 12 gauge 5-1/2" and/or 10 gauge for large volume administration e.g., Mila, Medicut
12. Pressure pump or hand bulb for accelerating the administration of intravenous fluids
13. IV tubes: Large-bore (at least 12 gauge) for high volume fluid flow
14. Flashlight and extra batteries
15. Hoof knife and hoof tester
16. Equipment to remove shoes
17. Scrub preparations
18. Sterile surgical pack and suture material or stapler
19. Bandaging materials
20. Needles and syringes
21. Various types of vacutainer tubes
22. Formalin jars
23. Postmortem knife/culturettes
24. Rectal sleeves and lube
25. Towels
26. Lily pads or blue foam or Equithane for sole support
27. Kimsey brace and/or splinting material (PCV pipe)
28. Portable IV pole: Use two pieces of aluminum conduit screwed together to 8-10 feet in length. (When unscrewed, the two pieces store out of the way under the back seat of your truck.) Use set screws to hold the two conduit pieces together, an eye bolt at the top section, and a clip to hold the fluid bag.
29. ISTAT (with EC8 and creatine cartridges) or Abaxis Chemistry Analyzer would be of great benefit in treating horses. An arrangement with a local hospital may also serve as a source for laboratory testing if none is available on-site.

### **Suggested List of Medications for the Treatment Veterinarian**

1. IV fluids: Multiple liter bags (3 to 5 liter bags) of physiological saline and a polyionic, non-alkalizing fluid (i.e., Ringer's) with a minimum total of 40-100 liters. More fluids may be required if a larger number of horses are expected or with elevated heat and humidity. A larger volume of fluids may also be needed at the higher stress of championship rides. A rule of thumb is 200 to 300 liters for 60 horses. Sodium bicarbonate solutions are almost uniformly contraindicated for the metabolic problems of endurance horses.
2. Oral electrolytes without bicarbonate
3. CMPK or Decaphos to serve as a source for Ca, K, Mg, etc.; calcium gluconate (dairy milk fever preparation)
4. Potassium chloride, 20-40 mEq/ml, may be used at the rate of 20-40 mEq/liter in horses with significant potassium deficiencies
5. Dantrolene as IV solution or capsules. As capsules, the horse may be dosed at the rate of 3-5 grams/1000 lbs.
6. 50% Dextrose solutions for IV and/or oral use
7. DMSO liquid for IV and/or oral use
8. Magnalax powder for oral supplementation as an antacid or salt laxative
9. NSAIDs (Phenylbutazone, flunixin meglumine, etc.)
10. Sedatives and Tranquilizers—xylazine, detomidine, butorphanol, acepromazine
11. Diazepam (Valium) 25-50 mg IV for the treatment of seizures
12. Ophthalmic medications
13. Antibiotics. Suggested choices: ceftiofur, trimethoprim/sulfadiazine (powder, paste or tablets), gentamicin, K penicillin or Na penicillin
14. Oxytocin (for treatment of choke)

15. Buscopan
16. Wound supplies: antibiotic ointment, bandaging materials, local anesthetic
17. Hypertonic saline solution
18. Euthanasia solution

## **TREATMENT PRINCIPLES FOR METABOLIC CONDITIONS IN DISTANCE HORSES**

Protracted endurance exercise places a huge physiologic demand on endurance horses, and occasions arise when treatment is necessary. With trial and error, each practitioner devises a treatment protocol that gives the best and most efficient results. Each horse presents a unique story and should be managed for its unique and specific problems. The philosophy of treatment at a ride should be to stabilize the horse to a point that the horse starts to eat and drink and take care of itself, while signs of fatigue and metabolic complications continue to improve.

It is important for all control judges and treating veterinarians participating in endurance rides to remember that there are situations that dictate the necessity of seeking a better environment for medical care than the ride base camp or control checkpoint. Every effort should be taken in advance to make arrangements with a well-equipped and well-staffed equine hospital to receive referrals from the ride.

Once the horse has been stabilized at the ride site, strongly consider a referral to such a facility in order to enhance the welfare of the horse. Confirm with ride management that they have prepared contact information including directions in advance of the ride. Management should have copies to give to owners. Send written information about what medications and treatment you have given. (See Appendix F for the Veterinary Treatment Form.) Your services are probably more important to the ride as a control judge or emergency treatment veterinarian than providing long-term, extended medical care that will likely be better provided in a hospital setting.

The following is a brief review of common metabolic abnormalities, a review of treatment principles, and a discussion of a variety of drugs (some old, some new) that are available to enable clinical recovery of fatigued and exhausted horses in distance sports. It is recommended that you familiarize yourself with treatment options and possibilities of metabolic complications of distance horses before you work a ride. The following material is meant as a reference guide of treatment protocols that can help to achieve successful resolution of metabolic problems and to hopefully reduce the possibility of secondary complications. The following treatment principles are not meant to supercede or replace your clinical judgment and the practical restrictions and limitations you may experience at the endurance ride environment. They are also not standards of care and the often-limited ability to provide this care at a remote ride site versus a hospital setting should be realized.

### **Recognition of the Exhausted Horse**

Any of the following symptoms may be present in a horse experiencing metabolic stress or failure:

- Delayed HR recoveries—pulse persistently above 64 bpm or labile
- Poor Cardiac Recovery Index (CRI)
- Abnormal gut sounds, either hypermotility or hypomotility
- Dry, scant or mucous-coated feces, indicating intestinal stagnation
- Lack of appetite
- Disoriented attitude or no interest in surroundings
- Depressed posture
- Lack of thirst—in the presence of clear signs of dehydration
- Anxious facial expression: glazed or sunken appearance of eyes, wrinkled lips
- Oblivious to external stimuli such as insect bites, application of rider's aids, or physical threats
- Loss of impulsion and elasticity of gait; ataxic or weak
- Skin pinch test remains tented but note there is often poor correlation of skin pinch test with level of dehydration
- Mucous membranes showing margination around gum line, muddy color, or dryness
- Poor jugular refill
- Flaccid anal sphincter or relaxed penis

- Thumps (synchronous diaphragmatic flutter or SDF) is often associated with intestinal atony and is related to decreased ionized calcium
- Hyperthermia: Rectal temperature above 103°F within 20 minutes of stopping exercise
- Decreased rectal temperature due to dilated anal sphincter
- Myoglobinuria—may or may not be accompanied with stiff or cramping muscles
- Exertional myopathy/muscle fasciculations/exertional rhabdomyolysis
- Signs of impending laminitis: increased digital pulses, camped-out stance, shifting weight, pointing foot, or overt Obel lameness
- Colic: anxious appearance, abnormal stance or lying down, gas distention, impactions, displacements, or any evidence of abdominal pain.

## Assessment of Hydration

Skin turgor, known as the skin pinch test, is informative after 3% to 5% percent dehydration, but varies with the amount of subcutaneous fat present. Mucous membrane refill and moisture can be helpful, but are somewhat subjective. Urine concentration observed in the stops will help to determine hydration status but this information is not consistently available to the control judges.

Packed cell volume (PCV) and total protein (TP) are also reliable estimators of hydration status. In the field, a Mobile Spin centrifuge can be used to spin down blood for use with a refractometer and hematocrit card for the determination of circulating fluid volume. Note that the PCV may not rise as much as the TP in a very dehydrated horse.

To gain an estimation of electrolytes, glucose, and some enzymes in the field, an I-Stat device (SDI Devices, Inc.) or Vet Scan blood chemistry machine may be used. These machines, though considered expensive in certain contexts, inform us of the health parameters of the patients and the effects of our treatment. They may be extremely valuable if a pre-existing disease is present.

## Intravenous Fluid Therapy

**The treatment of choice for metabolic disease in the endurance horse is the use of intravenous fluid therapy!**

Since the endurance horse can easily lose 10 to 15 liters per hour of fluid volume, horses in metabolic stress should receive at least 15-30 liters. Rapid fluid administration will not result in over-hydration provided kidney function is normal. Renal compromise that often accompanies myopathies can benefit from high volume flow. Urination should occur after the intravenous administration of 15-18 liters in hypovolemic conditions related to exercise, and it is a useful index of appropriate response to fluid therapy. If it has not, more measures may need to be taken to ensure adequate kidney function. These will be discussed below.

**Choice of Catheters and Fluid Administration Sets:** The best means of giving large volumes rapidly is with the **use of large-bore intravenous catheters, 12 gauge or 10 gauge in size.** (Through a 12 gauge, 5-1/2 inch catheter, 21 liters of fluid will flow over a period of about one hour.) Large-bore catheters and any catheter placed under conditions where asepsis is not achieved should not be left in long-term (>24 hours). The catheter should be sewn into or glued to the skin and a neck bandage applied so the catheter moves as little as possible. A large-bore IV extension set can be attached to minimize handling and movement at the end of the catheter.

Remember that the rate of flow through a catheter depends on the bore size of the extension sets and IV lines. Any in-line tube smaller than 12 gauge will restrict flow rate. (A large-bore catheter set that can be plugged into IV bags of pre-mixed fluids is made by Jorgensen Labs.)

Single liter bags can be used with an infusion pump to hasten flow, but this method is extremely time-consuming and not as cost effective as bulk fluids. They will, however, facilitate dispensing of specific medications into an IV line. When possible, warm fluids prior to administration of large volumes. This can be done with a microwave oven (from a nearby camper or convenience store) or bags of fluid can be immersed in the hot water baths to warm the fluids. The higher the fluids are hung, the faster the flow rate. In the field, some ingenuity may be necessary to find a fluid perch: Trees or tree branches work well, as does a horse trailer. A portable IV pole is described under the Suggested List of Equipment.

**Choices of Fluids:** For the dehydrated horse/exhausted horse complex, the objective is to expand the extracellular fluid volume, preferably using isotonic fluids. Many commercial preparations make this objective quite easy. The fluid of choice is

Ringer's solution which contains sodium, potassium, calcium, and chloride and is specifically indicated for correction of fluid and electrolyte deficits in the presence of metabolic alkalosis.

One of the more common fluids stocked in the clinic pharmacy is Lactated Ringer's solution. This fluid is really indicated for correction of mild acidosis due to its alkalinizing properties derived from the lactate buffer. In distance horses that are alkalotic due to losses of sodium, chloride, and potassium through the sweat, LRS may not be the best choice in all situations. However, if this is the only fluid on hand, a dehydrated horse would benefit from fluid of any type rather than none at all. The need for immediate volume replacement supersedes the acid-base condition of the horse, particularly when electrolyte imbalances can be corrected with potassium supplementation to return blood pH to normal.

Multisol-R or Normosol-R are often-used isotonic replacement fluid despite containing alkalinizing precursors of acetate and gluconate. To date, no adverse effects have been reported from administration of large volumes of these solutions to horses with metabolic alkalosis, and particularly if the potassium deficits are simultaneously replaced.

Normal saline (0.9%) is an excellent choice of isotonic fluid, however it will need to be supplemented with potassium and calcium to replenish those ions lost in sweat. If you run low on fluids, you can dilute one bottle of hypertonic saline (7% sodium chloride) with seven liters of distilled water to make a physiologic 0.9% saline solution.

### **Intravenous Fluid Therapy Supplementation**

One of the components of exhaustion in an endurance horse is depletion of energy. Because of this feature, it is critical to supplement at least part of the fluids with dextrose. By giving 50-100 grams/hour, blood glucose will be maintained at 150-250 mg/dl. Dextrose can be added at the rate of 100 cc/liter of 50% dextrose to make a 5% dextrose solution.

Potassium is lost in moderate quantities in the sweat of distance horses, and although supplied amply in hay and grass, the exhausted horse must receive supplementation to replenish acute losses, to maintain bowel motility, and to correct metabolic alkalosis. Signs of potassium depletion include muscle fatigue, elevated or irregular heart rate, and intestinal ileus. It is safe to give 20-40 mEq/liter of potassium chloride, with as much as 250 mEq/hour running through the fluids. Note when adding potassium to fluids that Multisol-R already contains 5 mEq/liter.

Calcium is another ion lost in large supply in the sweat. Signs of hypocalcemia include tachycardia, tachypnea, muscle fasciculations especially of the face (trismus) and triceps, dilated nostrils, and synchronous diaphragmatic flutter (thumps). Useful calcium supplements include CMPK or Cal-Dextro which may be given orally or intravenously. You may want to infuse this solution slowly through a separate IV catheter and monitor the horse's heart rate and rhythm as calcium overload will cause the heart rate to decrease.

Another supplement that may be added to the IV fluids is a 5%-10% solution of DMSO liquid. A solution of greater than 10% may cause hemolysis. Split one pint of DMSO liquid between 12 liters of fluids and only give this concurrent with generous volume replacement. As a potent diuretic, DMSO dilates renal vascular beds. It also neutralizes some of the toxic effects of myoglobin so is useful to treat rhabdomyolysis and to prevent acute renal failure. DMSO acts as an anti-inflammatory drug as it is a free radical scavenger and quite effective against the effects of endotoxins. The easiest and safest method of DMSO administration is via a nasogastric tube provided no ileus is present. In this case DMSO is mixed in a 1:5 ratio (up to one pint of DMSO) to avoid gastric irritation.

### **Oral Fluid Supplementation**

Oral fluids provide an excellent method of administering fluids provided the horse is not experiencing an ileus or gastric reflux. It is best to use isotonic fluids because hypertonic fluids irritate the GI tract and "pull" fluid out of the ECF into the bowel. By administering frequent amounts of small volumes, you can give 6-8 liters of fluids through a nasogastric tube every 30 minutes as needed. Gravity may be used, or a stomach pump may be used with care. A stomach pump is useful to try to establish a siphon to check for reflux. To minimize the horse's discomfort, remove the tube between treatments. The persistent presence of the stomach tube may elicit a gag reflex or dilate the stomach with air, and it is unnecessary provided there is no gastric reflux. In addition, removal of the stomach tube allows us to observe if the horse will begin to eat and drink.

Commercially prepared electrolytes and home preparations are available for administration through a nasogastric tube. CMPK (1 bottle of 500ml) + 50% dextrose (1 bottle of 500ml) + 1 tablespoon table salt + 1 tablespoon lite salt in 4-8 liters of water has

been recommended as a stall-side preparation that is an absorbable source of electrolytes and sugar.

Magnalax, a hypertonic salt laxative, will aid in circumstances of poor intestinal motility, or gas production by increasing the fluid in bowel contents and acting as an antacid. Use concurrently with IV fluid therapy.

Many times intestinal atony is related to electrolyte and fluid depletion in the endurance horse. However, once the cascade of an ileus begins, more may need to be done to stimulate intestinal motility provided there is not a serious impaction nor an intestinal displacement

Oral laxatives include: Magnalax as mentioned above and DSS (veterinary surfactant). These may be helpful in softening bowel content. An effective dose of DSS is 4-8 ounces per gallon of water given orally. Mineral oil (paraffin) has minimal effect in breaking down an impaction, as it will ooze past a blockage giving a false impression that ingesta is moving through the bowel. However, mineral oil will minimize toxin absorption from the bowel. Unfortunately, at the same time it will also diminish the uptake of glucose, electrolytes and water from the bowel lumen. If gastrointestinal toxins remain a concern, activated charcoal may benefit the horse.

## **Medications for Pain Relief**

Nonsteroidal anti-inflammatory drugs (NSAIDs) provide pain relief but must be used with some caution. Phenylbutazone (2.2-4.4 mg/kg IV) is the least expensive NSAID, but is the most ulcerogenic and nephrotoxic NSAID, especially in a dehydrated horse. Flunixin meglumine (Banamine®, generics; 1.1 mg/kg IV) and ketoprofen (Anafen®; 2.2 mg/kg IV or IM) are more expensive but less associated with toxicity than phenylbutazone. In horses that are dehydrated or when rehydration will be delayed, initial NSAID dosages should be reduced by 25-50%. Fluid deficits should be corrected as soon as possible and horses should be carefully re-evaluated before additional doses are administered.

Sedatives like xylazine (100-300 mg IV) or detomidine (5 mg) have relaxing effects to manage intestinal pain or muscle spasms. Xylazine also has diuretic effects. Recurrent dosing with xylazine or detomidine should be done with caution as both can temporarily slow intestinal and esophageal motility. This may add to the already present problem of an ileus and present an increased risk for choke. Butorphanol (5-10 mg) is a potent analgesic.

Tranquilizing with acepromazine (10-15 mg) is an excellent means of dilating the vascular beds in cramping muscles. However, its potent peripheral vasodilatory properties should be used with caution in a dehydrated horse as it could cause cardiovascular collapse and shock. For this reason, a dehydrated horse should receive adequate fluid replacement in conjunction with the use of acepromazine.

Corticosteroids are useful to inhibit the arachadonic acid cycle particularly related to effects of endotoxemia, however corticosteroids are not recommended in treatment of endurance metabolic disease because of the questionable influence on laminitis.

## **Rhabdomyolysis and Exertional Myopathy**

Myopathy, as seen in the endurance horse at competitions, is often related to a problem in energy utilization and electrolyte imbalances. It may also be heat or stress related or a result of storage myopathy. Early onset of a myopathy or “tying-up,” within the first five to 10 miles, is one of the most challenging and, unfortunately, an all-too-common problem seen in this sport.

These horses might originally be seen on the trail with a shortening gait and can be apparent as early as five miles out. On stopping, this will gradually develop into a tight, hard muscle cramp in the hindquarter which can, and often does, progress into a classic form of severe generalized tight muscle cramping. This results in reluctance to move, and an extremely painful animal. Some of these horses go down and should be left in place until some form of relief is administered. Any level of myoglobinuria is a sign of muscle trauma and should be a warning to the control judge or treatment veterinarian to attempt to avoid renal compromise.

**Treatment:** Fluids are essential for flushing the kidney tubules and improving muscle and renal perfusion. Normal saline or other polyionic fluid would be the fluid of choice. A volume of 20-30 liters would be an appropriate amount to start with. Significant dehydration, if it is present, would require more fluid volume.

Oral fluid supplementation can also be used at a rate of 8-10 liters/30 minutes if IV fluids are unavailable or difficult to administer. Ileus must be ruled out and normal active intestinal motility must be present prior to using oral medications.

Tranquilizers, muscle relaxants, analgesics and non-steroidal anti-inflammatories are also beneficial to the tied-up horse under the appropriate circumstances. Useful drugs and their dosages follow. These are useful but because they can all be detri-

mental in the hypovolemic patient, care should be taken to use them only after a safe level of fluid volume has been established. These medications would include acepromazine (10 mg/400 kg IM bid to qid as necessary); xylazine (0.2 mg/kg IV); detomidine (10-20 mcg/kg IV) and flunixin meglumine (1 mg/kg IV). Butorphanol, as an analgesic, is also a good choice at the rate of 0.02-0.1 mg/kg IV.

Dantrolene is a non-centrally acting spasmodolytic which acts by slowing calcium release from the sarcoplasmic reticulum. This results in muscle relaxation and is effective in treating the severe muscle cramping seen in the tied-up horse. The dose is 3-5 g orally. It comes in capsules and these can be opened and added to applesauce or administered by nasogastric tube. Slow IV dantrolene is also available and used at the dose of 15-25 mg/kg.

Heat, supplied over the cramped muscles, can come from many sources. Warm water towels, chemically warm packs, or white's liniment will help increase the circulation and assist in the relaxation of the heavy muscles. Placing a space blanket or a plastic trash bag over the rump will help to hold the heat in over a long period of time.

Acupuncture may also prove to be beneficial, particularly in the pain management aspect.

### **Use of Muscle Enzymes for Prognosis of Healing**

Creatinine Phosphokinase (CPK) has a high specificity for damaged muscle, peaking in serum within 4-6 hours of the insult. CPK is quick to return to normal once ongoing damage has stopped and it is a helpful predictor to monitor improvement and to help decide when a horse can return to exercise. CPK should return to <1000 micromoles/L before training resumes.

AST is slow to elevate, taking 24 to 48 hours to reach a significant elevation. AST takes weeks to return to normal and consequently provides poor predictive information.

### **Colic**

Acute and sometimes severe colics are not unusual in the tired endurance horse. Colic is one of the most common conditions encountered in the competing endurance horse. Abnormal GI motility can result from travel, hyperthermia, dehydration or fatigue. The long-term exercise in endurance can result in a shift of blood from the bowel to muscles, resulting in poor bowel motility and considerable discomfort. Colic can involve extended care and monitoring as part of the diagnostic and treatment plan. In considering the diagnostic and treatment recommendations for colic, it is equally important to consider the realities and limitations that may be encountered in the field setting at a ride site. In a ride setting, there will likely be potential problems with lack of help and equipment for administering fluids and ongoing care over a significant period of time. Consider also that engaging in a treatment plan that involves ongoing care will impact all other responsibilities that you may have at the ride including providing effective control of the ride. It is often prudent to recommend referral to a local veterinary facility for ongoing medical care and monitoring

Timely assessment of the cause of the pain is important and the risk of the horse damaging himself, other horses, or the people around him in a field situation should be addressed immediately. The pain is commonly caused by a slow bowel resulting in gas production, accumulation of fluid as in ileus, or impactions. Displacements, torsions, and intussusceptions have also been identified in the endurance horse. For these reasons, passing a nasogastric tube to diagnose and/or relieve gas or fluid from the stomach is important. Rectal exams are equally important. The danger of a fragile rectal wall due the dehydration is a real issue. A reminder of this is and the necessity of using good restraint and sufficient lubricant should serve to caution the treatment veterinarian but not to discourage him from using this diagnostic methodology.

The above information suggests that we use caution when horses are presented with poor motility. Stopping horses early is probably the best defense for the majority of colics seen in our sport.

### **Development of Hyperthermia**

A hyperthermic horse, with a persistent rectal temperature exceeding 105-106°F, is at risk for more complicated metabolic disease. The following is a list of symptoms and suggested treatment.

#### **Symptoms of Hyperthermia:**

- Note other signs of exhausted horse syndrome as above
- Panting

- Poor heart rate recoveries
- Stumbling/ataxia
- May feel hot to the touch; may not be sweating adequately or effectively
- Loss of mental alertness
- Disinterested in surroundings or environmental stimuli
- Can lapse into convulsions or seizures due to sensitivity of CNS to high temperatures.

**Treatment of Hyperthermia:**

**Intravenous fluids:** Dehydration is a major contributor to heat stress so this must be addressed! Cooling strategies:

- Cold water immersion in a lake or stream
- Continual dousing with water or pressure sprays, especially the head, neck, and lower limbs
- Fans or misting sprayers
- Ice boots on legs over large vessels
- Alcohol baths (one pint alcohol per gallon of water)
- Cold water enemas
- Stomach tube with cool water using small amounts at frequent intervals
- Remove all tack and equipment
- Shade.

*Note that once rectal temperature drops below 103°F, active cooling can be suspended for a time so the horse is not chilled too quickly.*

**Laminitis**

The number of metabolic syndromes in the endurance horse makes the possibility of laminitis very real. There are multiple sources for this painful disease including concussion, endotoxins, exhausted horse syndrome, intestinal displacements and myopathies. Because metabolic disease may often be followed by acute laminitis, be prepared to treat both medically and mechanically at the outset. Supportive wooden wedge blocks, styrofoam blocks, or Lily pads can be taped to the bottom of the foot to stabilize the coffin bone.