

Further to inquiries the FEI Veterinary Department has received regarding the implementation of Article 1029.f) of the FEI Veterinary Regulations:

for the disciplines of Eventing and Driving, the Examination on Arrival must include a clinical examination to assess the heart;

the following guidelines have been prepared to provide information on what this examination consists of and potential outcome:

Clinical Examination to assess the heart as part of the Examination on Arrival

Purpose:

The purpose of this regulation is to screen for horses that have undiagnosed cardiac abnormalities that may result in them being at-risk if they continue in sport.

The regulation applies to horses participating in Eventing and Driving events that include a marathon. This is because these activities are where FEI believes cardiac conditions that limit athletic performance have the most potential to adversely impact horse and therefore rider and driver safety.

Overview

FEI recognizes that cardiac murmurs and arrhythmias are common in equine athletes so there is a need to distinguish normal arrhythmias and physiologic flow murmurs from pathological abnormalities and that this cannot be done within the confines of the Examination on Arrival. However, what the Examination on Arrival can achieve is to identify those horses where further specialist cardiovascular examination is indicated.

Examination

The expectation is that the clinical examination at the Examination on Arrival will include auscultation of the heart with a stethoscope on both left and right sides of the horse at rest.

If the Heart Rate is raised at the Examination on Arrival because the horse is excited, it is not necessary to wait for the heart to return to a resting rate before carrying out the cardiac auscultation.

If it is not safe to carry out the cardiac auscultation at Examination on Arrival, it may be done once the horse is settled in its allocated stable.

Outcome

If either of the following findings is observed:

- 1. Irregularly irregular heart rhythm*
- 2. Left or right sided murmurs of grade 4 or above on a scale of 1-6*

then the horse must not be allowed to start on the marathon or cross-country phase unless it is accompanied by a report of a comprehensive cardiovascular examination documenting the cause of the abnormality and **expressing the opinion that the horse is either normal or has mild disease with an excellent athletic prognosis** (ter Woort 2022)

To be clear, if otherwise fit to compete, the horse may take part in the dressage phase before being withdrawn from the competition

References:

Reef, V.B., Bonagura, J., Buhl, R., McGurrin, M.K.J., Schwarzwald, C.C., van Loon, G. and Young, L.E. (2014)

Recommendations for the management of equine athletes with cardiovascular abnormalities
J. Vet. Intern. Med. **28**, 749-761

ter Woort F., Reef V., Stefanowski D. and Slack J. (2022)

Cardiac pre-purchase examination in horses – evaluation, outcome and athletic follow-up
Equine vet Educ. (2022) 34 (10) 530-538

Summary of Heart Murmurs in Horses

Normal heart sounds include **S1 (closure of atrioventricular valves), S2 (closure of semilunar valves), S3 (rapid ventricular filling), and S4 (atrial contraction).**

Heart murmurs are caused by turbulent blood flow and can be either physiological (normal) or pathological (associated with heart disease). Murmurs are classified based on their location and timing relative to the cardiac cycle. Some murmurs are physiological, while others indicate conditions such as **valvular regurgitation, congenital defects, or acquired abnormalities.**

Murmurs are characterized by:

- **location (point of maximal intensity - PMI),**
- **timing (systolic, diastolic, or continuous),**
- **intensity (graded 1-6).**

Other factors, such as the quality and radiation of the murmur, provide additional information but are less critical for diagnosis.

Murmur Type	PMI (Location)	Timing	Intensity	Frequency	Potential impact
Physiologic Murmur	Left base (Aortic/Pulmonic)	Systolic	Low grade (1-3)	Common	-
Mitral Regurgitation	Left apical	Systolic	Variable (1-6)	Common	+ to +++
Aortic Regurgitation	Left base	Diastolic	Variable (1-6), often musical	Common in older horses	+ to +++
Tricuspid Regurgitation	Right apical	Systolic	Variable (1-5)	Common	- to +

Murmur Type	PMI (Location)	Timing	Intensity	Frequency	Potential impact
Pulmonic Regurgitation	Left base	Diastolic	Usually soft (1-3)	Uncommon but can be normal	-
Ventricular Septal Defect (VSD)	Right base (radiates widely)	Systolic	Loud (4-6)	Most common congenital defect	+ to +++
Aorto-cardiac Fistula	Left or right base	Continuous or diastolic	Loud (5-6), thrill present	Rare but serious	+++

Table 1: **Diagnosing Heart Murmurs in Horses & potential impact on health and performance**

Emmanuelle Van Erck, 2025