CASE STUDIES

EQUISYM

EQUIMETRE

ARIONEO

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CASE 1:

DETECT A SUSPENSORY LIGAMENT INJURY

Context

- Arion is a gelding.
- He got injured during a training session on 12/18.
- Diagnosis: suspensory ligament injury. 6 mm tear in the medial part of the ligament.

Data interpretation

TRAINING SESSIONS DATA 06/01 AND 12/18

Date	Horse	Stride frequency at 45 km/h (strides / secs)	Stride length at 45 km/h (m/str)	Stride frequency at max speed (strides / secs)	Stride length at max speed (m/str)	Max Speed (km/h)
AVERAGE		2.44	5.07	2.44	4.91	44.5
2021-12-18	ARION	2.19	5.16	2.54	5.39	54.6
2021-06-01	ARION	2.31	5.42	2.37	6.26	53.4

Monitored with EQUIMETRE

At 45km/h, the stride length deteriorates, going from 5.42m on 06/01 to 5.16m on 12/18.

We can observe a similar trend when the maximum speed is reached, with a decrease of 0.87 m/stride between the two trainings.

Diagnostic

Arion was diagnosed with a 6 mm tear in the suspensory ligament.
He was then put to rest.

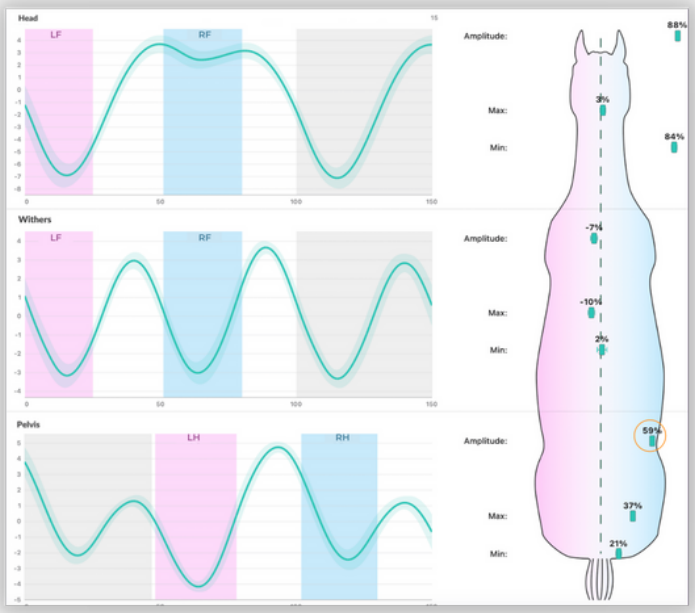
CASE 2:

IDENTIFY HINDLIMB LAMENESS NOT VISIBLE TO THE NAKED EYE

Context

- Following a significant locomotor asymmetry, Arion was examined.
- Everything appeared to indicate a RF lameness.

Data interpretation



Monitored with EQUISYM

The data suggest a left fore-right hindlimb locomotion defect with:

- Lack of vertical movement of the head which hangs up when bearing down on the RF, which visually confirms the RF lameness.
- Strong right hindlimb asymmetry with an amplitude of elevation default of +59%.
- Slight (-7%) left forelimb asymmetry.

Diagnostic

While visually all indications pointed to RF lameness, Arion's veterinarian was able to identify a RH asymmetry using EQUISYM, before starting the imaging procedures.

Arion was diagnosed with thickening of both proximal suspensory region and medial suspensory branch as well as lesions on the two fetlock collateral ligaments.

CASE 3:

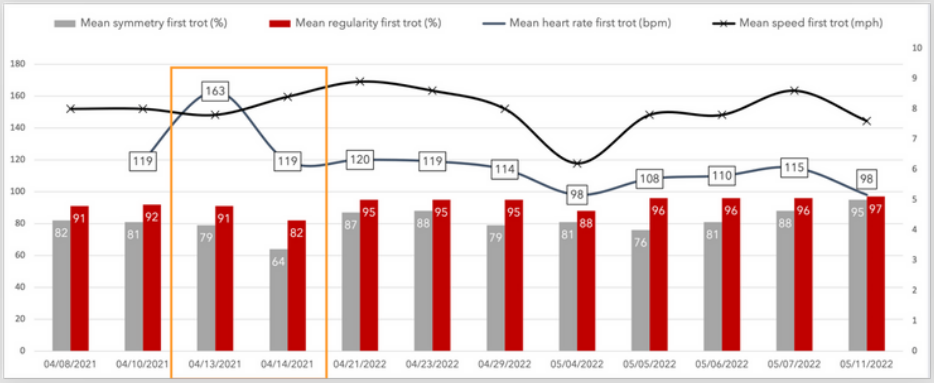
DETECT KISSING SPINES THANKS TO DATA

Context

- Arion a gelding, was regularly monitored between 04.08.2021 and 05.11.2021.
- Diagnosis : kissing spines that lead to reduced mobility and pain

Data interpretation

TRAINING SESSIONS DATA FROM 04/08 TO 05/11



Monitored wirh EQUIMETRE

- The speed curve is quite constant over time.
- Training on 04/13: heart rate is higher than usual, with a peak at 163 BPM.
- The day after this observation - 04/14 - his symmetry and regularity data were less good than usual.

Diagnostic

Arion was diagnosed with kissing spines. They are the origin of the abnormal data: as the spinous processes were very close to each other, Arion suffered from severe back pain.

The reduced mobility of his back can explain the poor symmetry and regularity of data. The heart rate peak on 13 april is a sign of pain during movement.

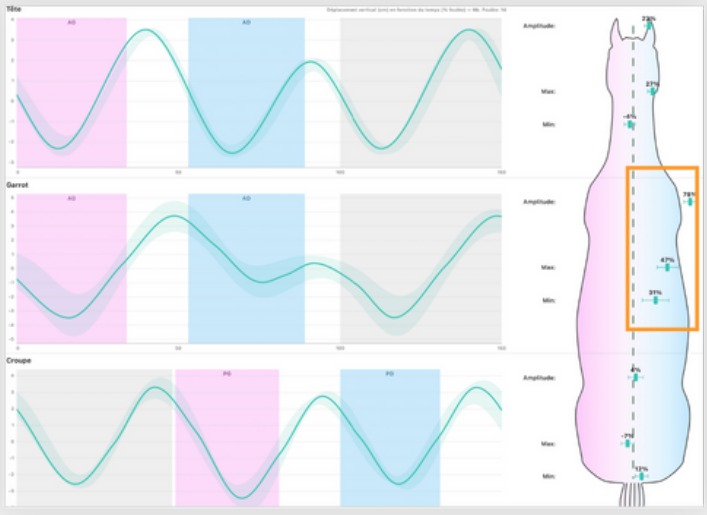
CASE 4:

INTERPRETATION OF AN AXIAL PATHOLOGY WITH EQUISYM

Context

- Arionea is an 8-year-old mare competing in Amateur category.
- She is being examined because her rider feels a locomotion defect that has been evolving for over 6 months.
- During the clinical examination, Arionea showed an RF pro-traction defect.

Diagnostic



Monitored with EQUISYM

- The data suggest a strong overall defect in the withers vertical amplitude with an asymmetry index of +78%.
- Pevlis data did not suggest any hindlimbs asymmetry. This seems to orient the diagnosis to an axial pathology.
- Head movement follows the right cervical restriction, with a vertical amplitude defect of +22%.

Imaging performed on Arionea revealed moderate epi-axial intervertebral synovial arthropathy, most pronounced in C6-C7 on the right, and chronic synovitis.

CASE 5:

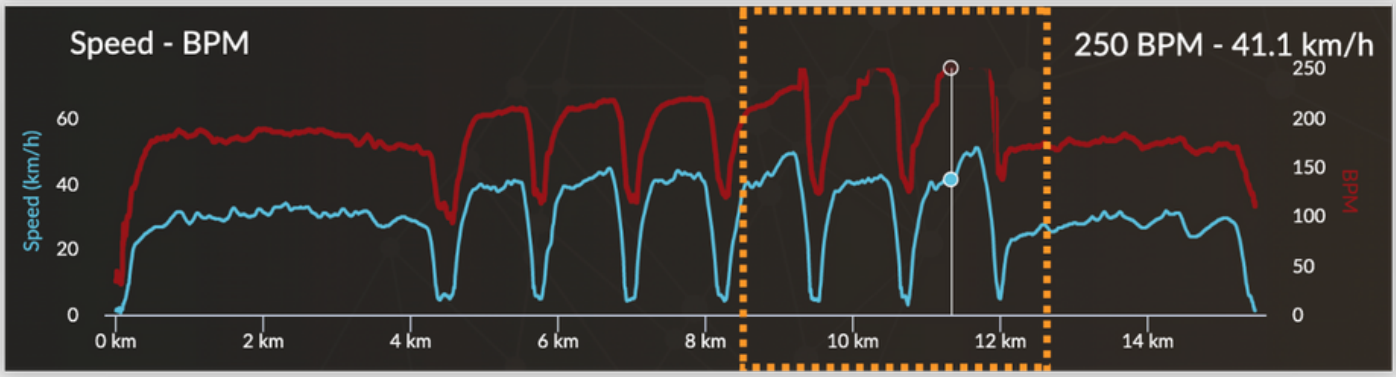
SIGNIFICANT BACK MUSCLE TEAR

Context

- Arionea is a 7 years old Standardbred mare. She was not performing well during training and not trotting correctly from her hind limbs.
- Following a training session monitored with EQUIMETRE, her trainer found a significant muscle tear in her back.
- The ECG collected directly during training was very unusual. Pain-related arrhythmias could be identified, which may indicate an abnormal neurological or possibly respiratory response and not a primary cardiac one.

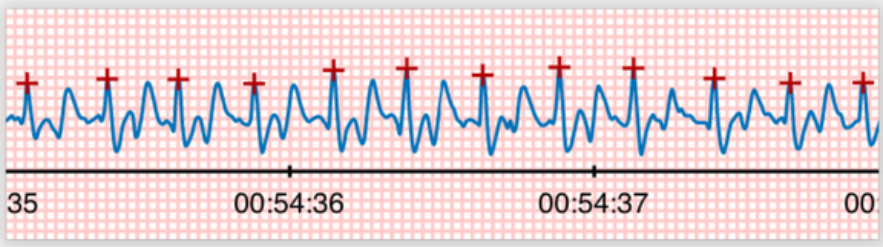
Data interpretation

Training sessions data - 19th of March



The graph shows an excessively high heart rate - 250 BPM for 41.1 km/h.

ECG collected with EQUIMETRE during the training



The ECG revealed significant irregularities and arrhythmias.

CASE 6:

BILATERAL FORELIMBS LAMENESS

Context

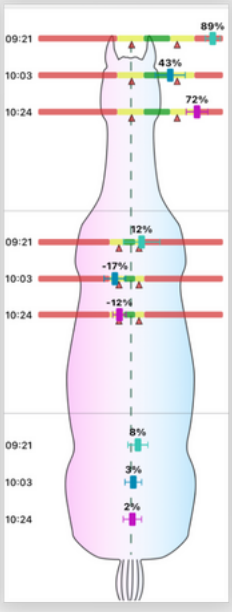
Arion is a show-jumping gelding with lame forelimbs.

Static examination: left forefoot higher than the right & slight sensibility to flexion of the left fore-fetlock.

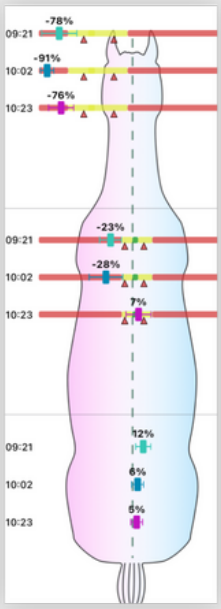
Dynamic examination: right forelimb lameness in right rein circle on hard ground & LF lameness in the left rein circle on hard ground (grade 2/5) - improved on soft ground.

Data interpretation

Right rein circle



Left rein circle



Data recorded with EQUISYM during the clinical examination

- Positive RF semi-ring block at the pastern: inversion of lameness in the right rein circle (withers sensor).
- Positive LF semi-ring block at the pastern: complete LF lameness improvement in the left rein circle (withers sensor).

Spontaneous locomotion

RF semi-ring block at the pastern

LF semi-ring block at the pastern

Diagnostic

The horse had bilateral distal interphalangeal arthropathy and chronic tendinosis of the flexor digitorum superficialis on the left forelimb.

CASE 7:

LONGITUDINAL MONITORING & RETURN TO WORK AFTER BACK SURGERY

Context

- Arionea is a 4-year-old filly who had a promising 3-year season on 1100m. Following an injury, she had back surgery performed in April 2022.
- Her last work before surgery (17/03) and the different stages of her rehabilitation were monitored with EQUIMETRE VET - on the treadmill and in training.
- She finished 2nd in her first post-operation race.

Data interpretation

Speed

Locomotion

COMPARISON OF GALLOPS BEFORE / AFTER SURGERY

Cardio

TREADMILL REHABILITATION FOLLOW-UP

Data compared on the EQUIMETRE platform

Date	Training type	Working Duration (hh:mm:ss)	Working distance (m)	Max Heart Rate reached during training (bpm)	Heart rate at end (bpm)	Fast Recovery (bpm)	Average stride length during the main work (m/str)	Heart Rate after 15 min (bpm)
10/15/2022	Treadmill	07:35	423	222	72	118	1.12	106
10/08/2022	Treadmill	02:36	134	213	68	105	0.41	60
09/24/2022	Treadmill	02:26	63	198	58	95	0.21	54
09/17/2022	Treadmill	07:45	186	214	64	75	0.29	76

CASE 8:

QUANTIFYING EQUINE LOCOMOTION DURING SINGLE DRIVING

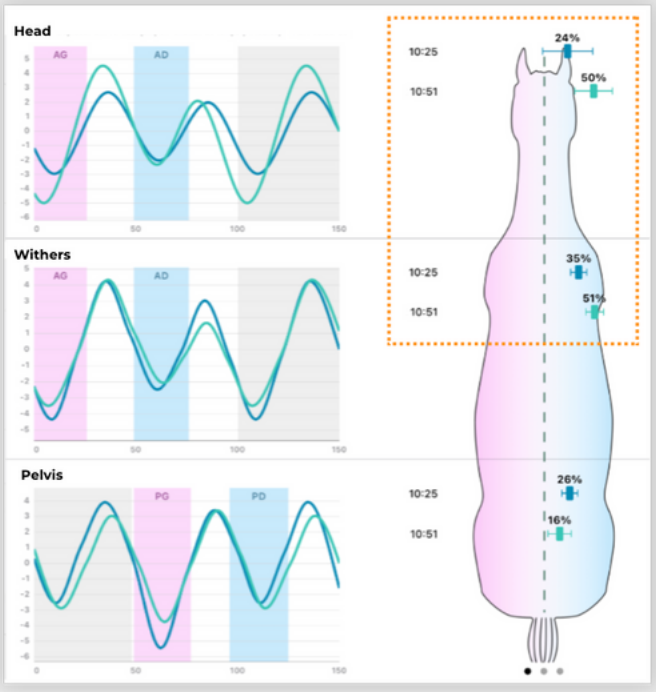
Contexte

Arionea is a driving pony. She underwent a locomotor assessment to investigate intermittent right forelimb lameness.

She presented RF relief in all the circumstances of the examination, more pronounced in the corresponding hand on hard and soft surfaces (grade 1/5). When harnessed, the RF lameness worsened, especially in the corresponding hand (grade 2/5).

Imaging revealed a bone fragment opposite the bicipital bursa on the right shoulder. In addition, conflicts of the spinous processes from T12 to T17 were identified.

Diagnostic



Monitored with EQUIMETRE

When Arionea is harnessed, its RF amplitude of elevation increases from :

- +24 to +50% for the head
- +35 to 51% for the withers

RF asymmetry is more pronounced during driving.

SPONTANEOUS LOCOMOTION

Right-rein circle - Soft surface

DRIVING LOCOMOTION

Right-rein circle - Soft surface

CASE 9:

EVALUATE THE AEROBIC SYSTEM'S PERFORMANCE

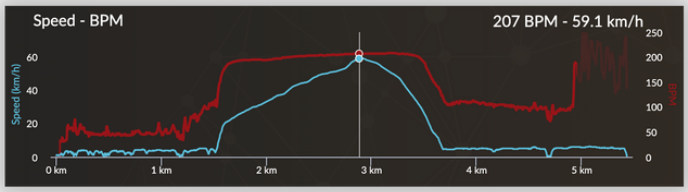
Context

- Arion I (7 years old) & Arion II (2 years old) are two Thoroughbreds in training.
- They are doing the same exercise: a 1200m sand track progressive canter.

Is it possible to compare the efficiency of their aerobic systems?

Data interpretation

Arion I



Arion II

Data collected by Equimetre

Data gathered during training show that the heart rate (HR) curve of Arion I peaks early in the canter and then stabilises at a much higher level than that of Arion II.

Arion II seems to have a more efficient aerobic system: it entered the anaerobic zone later.

This observation is associated with a shorter time spent in zone 5 - Anaerobic - for Arion II, and therefore a faster recovery.