

# Post race syndromes in the racing greyhound

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## 1. Heat stress

### Incidence

Common in hot weather.  
Affects all breeds of dogs.

### Aetiology

Running dogs on hot days and then not allowing adequate time to cool before confinement in poorly ventilated area such as a dog trailer.

### Clinical signs

Salivation, frantic panting, cyanosis, collapse.  
Death may occur from Disseminated Intravascular Coagulation (DIC) or renal failure.  
Greyhounds with heat stress may develop CER.

### Treatment

Cool the dog with cold water hosing and towels.  
Rapid administration of intravenous fluids to maintain blood volume and circulation and treat any dehydration.

## 2. Cramping

### Incidence

Commonly seen in nervous, excitable and unfit dogs.  
Some dogs have a natural predisposition to cramp.

### Aetiology

Uncertain.  
(a) Hypoxia caused by dehydration.  
(b) Electrolyte imbalance inducing a tetanic muscle spasm (potassium, phosphorus, magnesium, and calcium are involved).

### Clinical signs

Affected dogs slow or stop during a race.  
Affected dogs may yelp during running.  
Tenseness and painful spasms of the quadriceps femoris, triceps brachii or thoracolumbar muscle  
Most cramped muscle groups relax after 10–20 minutes.

### Clinical pathology

After cramping the AST and CK levels may be raised.  
Low serum potassium phosphorus and calcium levels may be found.

PCV and plasma protein may be increased.

### Treatment

Gentle exercise should be tried but do not force the dog to walk.

Vigorous massage across the muscles (not up and down the leg), this is called cross-fibre friction.

A greyhound that cannot walk of its own accord should be carried off the track and be examined by the OTV.

Application of heat packs and gentle stretching of the affected muscles.

Severe cases may require intravenous fluids which contain glucose to help restart glycolysis.

- Add 250–500 mg calcium supplement such as calcium carbonate or calcium gluconate daily.
- increase the dietary fat intake using both animal fat and vegetable oil.
- Potassium supplements daily.
- Phosphorus supplements
- Magnesium supplements
- Quinine bisulphate tablets 300 mg 4–6 hours pre-run (increases the muscle endplate potential)
- Selenium supplements.
- Decrease the workload and correct all musculoskeletal injuries.
- Feed premium-quality dry food which have fat levels providing 40-50% of dietary energy.

### Prognosis

Fair.

## 3. Thumps

Spasm of the diaphragm and intercostal muscles.

The condition may last for a few seconds to a few minutes, but usually less than 5 minutes.

The spasms are not related to heart rate or respiration rate.

It occurs post-racing and has varying severity.

It is not fatal.

It is not distressing to the dogs and is unlikely to affect performance (Karamatic 2013).

### Incidence

Occurs more commonly in dogs that are in intense training during hot weather.

Young females racing over longer distances than they had previously raced, and which were placed in the first 3 placings and having had thumps observed at previous starts are more predisposed.

Karamatic (2013) found in a study of 4020 dogs that 23.9% were affected.

### Aetiology

Multifactorial and not fully understood.

Hot weather, over-training, overly excited dogs, and dehydration are all involved. Karamatic (2013) found that at 10 minutes post-racing affected dogs showed reduced ionised calcium, venous pH and bicarbonate levels, (but this same fall was seen in dogs without thumps). A more significant change was a greater pCO<sub>2</sub>, suggestive of increased respiratory compensation caused by exercised induced metabolic acidosis.

### Treatment

- Strict attention to adequate cooling, IV fluids and the provision of oxygen.

In some cases it is important to provide advice to trainers regarding fluids/electrolytes, training and racing schedule.

- 200 mg calcium gluconate IV 6 hours before running has helped some dogs. Up to 3 treatments may be needed. There is a poor response to oral calcium.
- Bronchodilators such as Clenbuterol may also help prevent “thumps” occurring.

#### 4. Exercise-induced ataxia

##### Definition

Ataxia and respiratory distress post-racing. The dog may remain standing or become recumbent.

##### Clinical signs

The ataxia may last for a few seconds to a few minutes.

It has varying severity.

Mildly affected dogs recover within 5 minutes, and rarely required veterinary intervention.

Severely affected dogs may die.

##### Incidence

Occurs more commonly in dogs that are in hard training during hot weather.

The condition may be observed after any distance is raced but is more common after races over distances greater than 450 meters.

Karamatic (2013) found an incidence of 0.4% in 4020 starts.

##### Aetiology

Multifactorial and not fully understood.

Hot weather, over-training, overly excited dogs, bronchoconstriction and dehydration are all involved. Karamatic (2013) found that littermates are likely to be affected and that affected dogs may pass it on to their offspring (i.e. a strong genetic link is suspected).

##### Treatment

Support in the dog in a standing position, administer oxygen therapy and supply small amounts of water.

##### Prevention

Use of bronchodilators reduces the incidence and severity of the condition.

#### 5. Chronic respiratory disease

##### Incidence

Common in dogs with previous acute tracheobronchitis infection.

##### Aetiology

Damaged mucous membranes of the respiratory tract after respiratory tract infections.

A loss of cilia from the respiratory tract occurs and mucus cannot be expelled normally.

Mucus builds up in the respiratory tract, causing irritation and coughing.

Irritation caused by rapid breathing during racing and from cold air induces bronchospasm and coughing.

##### Clinical signs

Affected dogs cough post-racing and do not run as strongly as they used to.

A cough is easily elicited on tracheal palpation and thoracic percussion.

Froth may be seen at the corners of the mouth after running (trainers often mistake this for nausea). Froth accumulates in the pharynx.

#### Treatment

##### Bronchodilators

Most important therapy for this condition and the treatment may need to be long term.

- Clenbuterol HC1 0.04 mg bd
- Aminophylline 10 mg/kg bd
- Terbutoline 5 mg bd

##### Mucolytic medications

- Bromhexine 0.5–1 mg/kg bd × 7 days

## 6. Exercise-induced asthma (EIA)

#### Aetiology

Thought to involve overstimulation of the parasympathetic nervous system, which causes bronchospasm.

#### Clinical signs

Post-racing cough that lasts for a few hours. Affected dogs may not run as strongly as they used to.

#### Treatment

##### Bronchodilators

- Clenbuterol HC1 0.04 mg bd
- Aminophylline 10 mg/kg bd
- Terbutaline sulphate 5 mg tablets bd or td

Most dogs do not need long-term treatment and the condition usually abates after a few trials. Treatment should be continued between trials to maintain relaxation of the bronchial smooth muscles.

## 7. Canine exertional rhabdomyolysis ('acidosis')

#### Incidence

Commonly occurs in summer.

May be seen after a cold weather when dogs are using more energy than normal for heat production.

#### Aetiology

Theory: hypoxia caused by muscle cramping and dehydration.

CER is related to running, especially when the dogs have not had adequate time to cool down. At least 20 minutes must be allowed for the Greyhound's body temperature to return to normal.

Common in unfit dogs run on hot days over distances longer than they are used to running.

#### Pathophysiology

Hypoxia and lactic acidosis cause cell death.

Normal energy pathways are:

$ATP \Rightarrow ADP + P$

$Phosphocreatine + ADP \Rightarrow creatine + ATP$

During aerobic glycolysis, glucose is metabolised to pyruvate, which enters the TCA cycle.

1 mole of glucose produces 38 moles ATP with  $CO_2$  and water as the end products.

During anaerobic metabolism, the pyruvate produced from the breakdown of glucose cannot enter the TCA cycle because of the lack of oxygen and it is metabolised to lactate. Only 2 moles of ATP are produced per mole of glucose.

The lactate accumulates, causing a decreased intracellular pH.

If the normal cell buffering mechanisms become exhausted, the pH continues to fall and fatigue and cramping occur.

Cramping reduces local circulation, exacerbating the hypoxia.

Finally, there is a breakdown of intracellular protein, cell death and release of myoglobin into the blood.

Myoglobinaemia may then cause problems at the glomerulus, inducing renal shutdown, and so it is important to maintain renal perfusion.

Any pre-existing dehydration problem will exacerbate the situation.

### Clinical signs

Vary from mild cramping to severe rhabdomyolysis.

Mild cramping is seen as a painful spasm of the quadriceps femoris, triceps brachii or thoracolumbar muscles post-run. Spasms may last for 20–30 minutes.

Severe CER causes extreme pain of the thoracolumbar muscles for up to 2–3 days. Some dogs are unable to move (similar to a dog with vertebral disc disease).

There is swelling and pain of the involved muscle groups. The dog is very distressed.

PU/PD may be present.

In severe cases death may result.

Weight loss occurs (10–15% body weight) because of the breakdown of muscle tissue and fluid loss.

### Clinical pathology

Increase PCV and total plasma protein because of dehydration.

Myoglobinuria, proteinuria, increased CPK and AST.

ALT may be increased because of hepatocyte damage.

### Treatment

Rapid IV fluids

- Hartmann's solution or Dextrose Saline to expand fluid volume, maintain renal perfusion and correct dehydration. Maintaining renal perfusion is important to prevent nephrotoxicosis from excess myoglobin.

NSAIDs can also be used if renal function is adequate.

*Note:* corticosteroids are contraindicated.

Sedation

- 2–4 mg ACP IV, 10–15 mg diazepam IV

Analgesia

- Opioids such as buprenorphine or butorphanol are indicated if the dog is very distressed or painful.

- Consider oxygen if the dog is cyanotic.

- Antibiotics are given to prevent renal infection.

- Multivitamin amino acid infusion is given to provide nutrients.

### Prognosis

Fair. All affected dogs will need a long rest.

### References

Karamatic S. Investigation of post exercise distress syndromes (PEDS) in Australian Greyhounds: Research Update 2013. In: Proceedings of AGV conference, 2013

