

**INQUIRY INTO PROPOSAL TO DEVELOP ROSEHILL
RACECOURSE**

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Partially
Confidential

Submission 09
Addendum

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Preamble:

The Rosehill Racecourse Select Committee asked for submissions from the public and I subsequently presented Submission 09. Integrity was a topic itemised for discussion. *Integrity* and the *welfare* of racehorses are entwined to such a degree that any evidence, and there is plenty, that any poor welfare of Australian Stud Book registered Thoroughbreds amounts to a failure of racing authority and veterinary regulatory legitimacy. That is, the integrity of these regulatory authorities needs scrutiny at the highest level since the *Five Domain Model* as it is applicable to racehorses is contravened throughout the whole racehorse industry structure.

This dissertation is focused on one major aspect of racehorse welfare and that is racing 'unfit' horses due to locomotory dysfunction, hence this simplified over view of why *preventable* anatomical injury is the main cause of mortality, morbidity and horse 'wastage' in Australia.

On *8th December 2014*, I wrote to the Hon. Troy Grant Minister for Hospitality, Gaming and Racing appealing to him to consider a group of medical conditions (discussed below in uncomplicated terms) of the distal fore limbs of racehorses that are essentially ignored and have the potential to raise the risk of horse racing from '*high*' to '*extreme*'. It was not until further prompting that I finally received a reply from Mr P N V'landys dated *14th February 2017*, *over two years later*. This long delay was perceived to indicate how little they seemed to care for the welfare of both riders and horses. Largely, all that was asked was for Racing NSW to adopt a duty of care for riders and horses in way of taking a more vigorous pre-start scrutiny of horses' feet to ensure the horses were fit to race as many were, and still are, clearly unfit (Figures 1 & 2) due to poor foot care.

Figure 1. This photo was provided anonymously and was reported to be the left foot of a horse that fell and the rider was killed. There is significant asymmetry of the hoof capsule (hoof wall and bulbs of the heel) that unequivocally demonstrates latero-medial imbalance and imbalance in the anteroposterior plane. This is a common 'root cause' of many catastrophic breakdowns with loss of life.

Figure 2. This gelding was 'sacked' from a high-profile stable at Flemington Racecourse. All four hoof capsules are clearly imbalanced latero-medially, and in the anteroposterior plane (four orange circles). Resultant tissue damage is evident higher (two red circles) and the horse had acquired navicular disease.

Most text books on equine lameness commence with discussion on conformation. It is my contention, generally speaking, any horse's conformation, particularly the forelimbs, that falls outside the boundaries that are considered 'normal' should be *prevented* from racing (Figure 3).

This would include but not limited to conformation anomalies termed: base narrow, base wide, toed-in, toed-out, valgus, varus, calf kneed, over at the knee, imbalance latero-medially, imbalance in the anteroposterior plane, and other. A horse carries most weight on the forelimbs and hence any defect that does not allow an even spread of forces over the entire foot-ground surface area upon impact likely becomes the root cause of numerous ailments, some being far remote from the primary defect viz. the fore feet. It therefore comes as no surprise that 30% of all fractures are reported to be pelvic and tibial stress fractures.

Figure 3. This horse was not seen by the author and any description here is an interpretation from this photo. This toe-in horse was reported to have had many starts and plagued by ongoing chronic lameness. The left fore foot is affected more than the right foot so it would be expected any uneven distribution of weight would eventually cause pain. The right upper forelimb appears to display muscular hypertrophy (asymmetry) indicating shifting of weight to this limb. The hind fetlocks appear swollen also indicating a further shift of weight to the hind limbs to relieve weight bearing from the front. In my opinion, this horse should have been *prevented* from racing.

As inconsequential as it may seem, understanding the basic principles of why the fore feet can create such poor biomechanics, is in my view, the 'holy grail' when it comes to why so many horses are breaking down. That is, a study of resultant forces and associated vectors (Theorem of Parallelogram of

Forces) can provide an understanding of how injurious shearing forces arise. Similarly, rotational forces (torque) culminate micro injuries with each horse's step that can eventuate in catastrophic break down.

Discussion:

The following is a simplified explanation of how commonly observed fore limb anomalies generate life threatening breakdowns when horses are forced to perform high intensity work over varying distances and over time.

When a horse's foot lands during a gallop, it *'slides' forward a short distance* being nature's way of relieving forces (providing 'give') from the fore limbs. The *slide distance* varies with the *type of surface*. Generally, the slide distance is more on dirt and least on synthetic tracks. The following case studies are some of the most common detrimental manifestations observed in racing stables and racing precincts.

Case 1: Latero-medial imbalance (Figure 4).

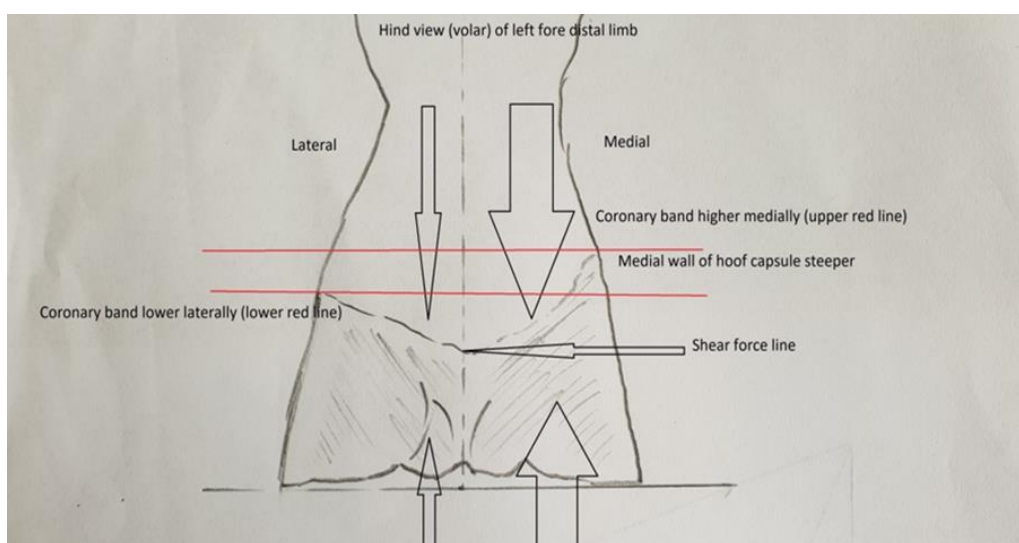


Figure 4. This sketch (author) illustrates a case due to poor farriery where most weight is being borne medially and not evenly distributed across the ground-hoof surface. Because the lateral and medial forces bearing down are different in magnitude, a shear force line is created along the dotted line that may cause a painful condition referred to as 'Sheared Heels'. In addition, the more weighed side will resist sliding and a rotational force (torque) about a central axis (dotted line) will also occur. If this easily recognised deformity is not corrected, cumulative tissue damage gives rise to a high probability of catastrophic breakdown.

Case 2: Low heel syndrome'.

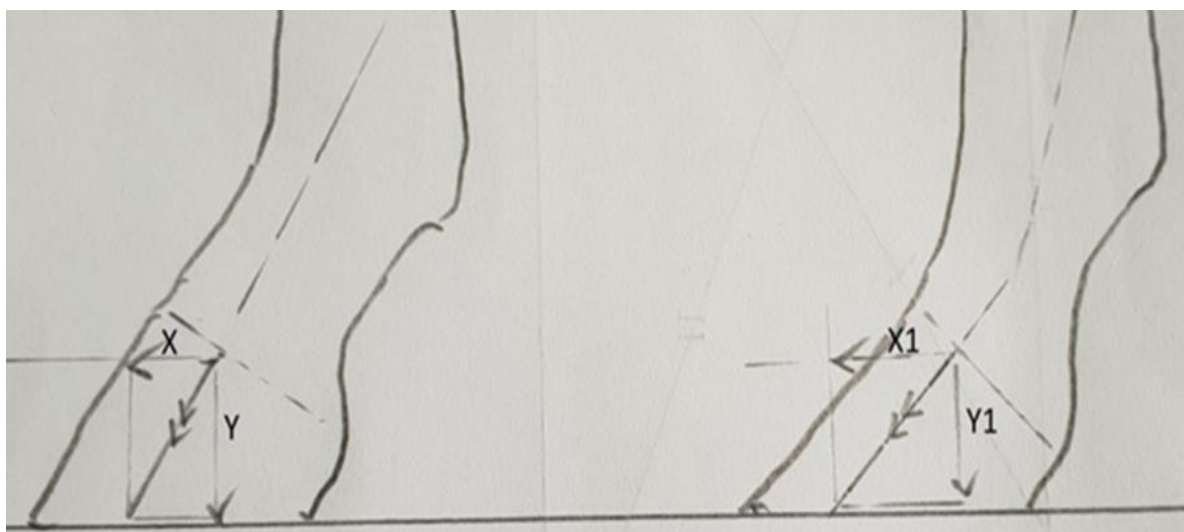


Figure 5. These rough sketches (author) compare a correctly balanced foot in the anteroposterior plane (on the left) to an unbalanced foot (on the right). That is, the foot on the right illustrates the hoof-pastern axis being broken downward (dotted line) due to having an abnormally flatter heel (again, usually due to poor farriery). If a *Parallelogram of Forces* is constructed and the assumption made that the horn tubules follow the direction of *Resultant Forces* (Figure 6) then from observation, it can be seen the horizontally directed force (vector X) has increased (vector X1) in length and magnitude and the downward force (vector Y) has shortened (vector Y1). This graphic increase in length of vector X represents an excessive shear force through the foot and most weight now being borne by the front of the foot inhibiting break over (Y shortened to Y1).

Figure 6. The direction of the visible horn tubules of the hoof wall have been highlighted with a marker pen. It is accepted these align with the resultant forces exerted in the distal limb from the weight of the horse.

Case 1 and Case 2 commonly coexist.

Case 3: 'Long toe, low heel syndrome'.

When Case 2 coexists with excessive toe then even more delayed break-over of the foot occurs associated with more load and drop of the pastern. This combination increases the probability of bone, tendon and ligament injury, more so when the slide is longer.

Case 4: 'Toed-in' fore feet

Horses that are toed-in ('pigeon toed') have latero-medial imbalance where more weight is distributed on the lateral half of the foot. Throughout slide, there will be a rotational force (torque) medially.

Case 5: 'Toed-out' fore feet

Horses that are toed-out similarly have latero-medial imbalance where more weight is distributed on the medial half of the foot. Throughout slide, there will be a rotational force (torque) laterally.

Of course, many more Case studies exist however it should be becoming clear that a horse's feet are all important for the safety of horse and rider at speed.

The centre of gravity (CG) of an unriden horse is approximately at a location adjacent to the point of the elbow and this CG will rise with the added weight of a rider, more so when a jockey rides with very short stirrup leathers (Figure 7) as is common place in contemporary times. Any imbalance on the part of the rider will have the horse working harder to maintain stability (retain equilibrium and remain upright). If we add further encumbrances in way of hoof capsule imbalance and torque as discussed above and whipping then the probability of injury and degenerative disease escalations.

Figure 7. If the horse and rider are considered a composite unit then the centre of gravity of the horse CG (adjacent to the point of the elbow) will move towards the centre of gravity of the jockey. That is, the CG will move to CG1 that will be elevated and hence causing less overall stability. The horse will need to work harder to remain upright thus placing more anatomical stress on the limbs.

Most racetracks have a number of turns. Each turn is a curve with a radius r . When a horse negotiates a turn at speed a significant *centripetal force* is created towards the centre of the curve in the direction of r . This force can be expressed as $F = mV^2/r$ so it is real. Centrifugal force is hence another major component further impacting stability and the horse's demise if already compromised by distal limb imbalance described above.

Conclusion:

All horses categorised in the Case studies listed above accrue microscopic injuries with each and every step a horse takes during training and racing.

The Laws of Physics abound throughout the aforementioned discussion and the issues defined, as harmless as they may seem at first glance, are life-

threatening for horse and rider and must be addressed and taken more seriously. I understand there is a direct link between poor biomechanics and injury. The legal ramifications could be sobering particularly if serious injury or death was to occur and found attributed to some basic preventable aberration from normal that allowed the risk to race to become 'extreme'.

Recommendations:

1. Implement an intensified pre-race veterinary examination of all horses.
2. Conduct compulsory workshops to educate stewards, trainers, farriers and veterinarians to recognise and understand the sequelae of unsatisfactory hoof capsule distortions and distal limb angular deformities. Mr P N Vlandys assertions in his letter dated *14th February 2017* inferred that all is under control, when it clearly is not. State and Federal racing authorities need to exercise a Duty of Care to prevent further mortality and morbidity to horses and riders.
3. Place a moratorium on racing two- and three-year-old horses.
4. Ban the whip to prevent driving horses to exceed their physiological, mental and structural limit.
5. Improve the surfaces of all racetracks in order to reduce excessive slide during intense gallops.
6. Review and apply the *Five Domains Model of welfare* (nutrition, environment, health, behaviour and mental state) as they apply to horses.
7. Examine modern breeding ideology and cap the number of horses bred.
8. Horses should, at least, be provided with day yards and not confined to stables for extensive hours during the day.

It has become increasingly evident the Australian public has no stomach for ongoing cruelty to all animals.

The aforesaid has been offered without prejudice and in the spirit of racing horses more safely. Furthermore, there is no malice intended from my part

against any party or parties known or unknown whosoever.

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