Grayson-Jockey Club Research Foundation
RESEARCH SPOTLIGHT
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Welfare and Safety of the Racehorse Summit

Sudden Deaths: A Puzzle That Still Must Be Solved

Sudden death is an abrupt fatality in a seemingly healthy horse related to exercise.

By Sean Collins

One of the largest puzzles still to be solved by the equine medical community is the occurrence of "sudden death," which involves an abrupt fatality in an apparently healthy horse during or immediately after exercise that is not associated with a musculoskeletal injury.

Exact causes for these sudden deaths have proven hard to decipher. With high-profile cases occurring in recent years, such as the training deaths of 2021 Kentucky Derby (G1) first-place finisher Medina Spirit and 2023 Santa Anita Derby (G1) winner Practical Move, the solving of such a phenomenon has become increasingly important to the racing community.

Dr. Stuart Brown, Keeneland's vice president of equine safety, moderated a panel June 25 at the Welfare and Safety of the Racehorse Summit in Lexington to discuss the state of the equine medical field in solving the sudden death puzzle.

"We're talking about something that happens in less than one out of 10,000 starts," Brown said. "It certainly comes—through the nature of that rate of occurrence—with very tough phenomena with which to study."

Dr. Stuart Brown, DVM
Photo: Keeneland/Photos by Z

Sudden death in Thoroughbreds is often compared to a human having a heart attack, though heart issues alone do not cause all sudden deaths in horses. Although cardiovascular failure is believed to be a cause in many cases, sudden death has also been known to occur due to trauma to the spine or hemorrhages associated with a fracture, colic, or infectious disease.

"We know that about half of the exercise-associated sudden deaths are due to cardiac issues," said Dr. Lynn Hovda, chief commission veterinarian of the Minnesota Racing Commission. "What we don't know is what is strictly normal in a horse. ... We have a large knowledge gap that we need to fill."

Many potential risk factors, such as cardiac arrhythmias, a condition in which the heart's electrical signals don't work properly, can be present in healthy equine athletes.

"When you look at healthy exercising Thoroughbred racehorses, about 82% of them have at least one premature depolarization during exercise," said University of Minnesota professor and researcher Dr. Sian Durward-Akhurst. "(Many) have multiple premature depolarizations and about 20% of them have some kind of complex arrhythmia. ... Trying to say which horses are safe and which horses are not is really quite difficult."

University of Kentucky veterinarian pathologist Dr. Laura Kennedy said she is able to diagnose only about half of sudden death cases.

"There can be significant overlap between a catastrophic injury and sudden death in the amount of pulmonary hemorrhage," Kennedy said. "A catastrophic injury, that's a very dramatic event. I could see that it could cause some hemorrhage in the lungs.

"The heart is an electrical instrument. It's going to be looking at those tiny conduction differences. That's where we have to focus."

The panelists agreed that the best path forward to solving sudden deaths is communication. Discussing changes in the horse's behavior, medical history, and other factors with the trainer can help paint a bigger picture of what external factors could have led to the sudden death.

(L-R): Dr. Sue Stover, Dr. Laura Kennedy, Dr. Sian Durward-Akhurst, Dr. Lynn Hovda., in the panel discussion on "Sudden Deaths in Racing: Where are we today?"

Durward-Akhurst also pointed out that atrial fibrillation, an irregular and often rapid heart rate that commonly causes poor blood flow, could be an important aspect to study.

"We know it causes problems, we know it reduces performance," said Durward-Akhurst.

Atrial fibrillation is yet to be directly linked as a cause of sudden death, but according to Durward-Akhurst, it can remodel the heart. If experienced consistently during and after exercise, it potentially could put a horse at higher risk of sudden death.

Genetics are also being researched to determine whether there are specific genes that make certain horses more at risk. She reported that many samples have been taken over the last four years.

"This is probably going to be a complex tree," Durward-Akhurst said. "There might be some families where it's simply inherited. Maybe there's one gene that is causing it, but overall the sudden death is likely going to be a combination of variants."

If genetic risks exist, they can be combined with other factors such as performance history, training history, medical history, and more to determine an overall risk factor for sudden death.

University of California, Davis distinguished professor emerita Dr. Sue Stover mentioned that the one benefit to not knowing the exact cause is having the opportunity to research a wide range of potential causes that could impact horses' health.

"The more we know about the causes, the more we can work on intervention and prevention," Stover said.

The panel closed by pointing out how far equine medical technology and research have come over the last few decades. With better resources and renewed passion and dedication by researchers, the unsolvable puzzle may start having the pieces put together within the next decade.

"We can do this," said Kennedy. "Sudden death is a trickier problem because it is not biomechanical. It is biologically functional. It's a much more difficult thing to wrestle with, but we can do it."

Reprinted from BloodHorse Daily

Summit Panels and Speakers Included

REDUCING RACING FATALITIES WITH DATA: EQUINE INJURY DATABASE AND MCKINSEY REPORT

What We Know:

"There's so much statistical power here that actually we're now able to (analyze risk factors and the efficacy of safety measures) quite efficiently," said Dr. Tim Parkin, who has consulted on the EID since 2009. "It means that this new model has in excess of 25 statistically significant risk factors in it."

What's Next:

"There really has been a significant reduction," said Ben Vonwiller of McKinsey & Company. "That said, there's still a substantial gap between the North American average and what we call the international standard (essentially Australia, Great Britain, Hong Kong, Japan, and New Zealand). That gap points to further opportunity."

Key Take Aways:

Dan Singer, also of McKinsey & Company said, "There's more awareness, there's more teamwork. The attending vets can work together to help trainers make good decisions for the health of the horse."

Reprinted from BloodHorse Daily

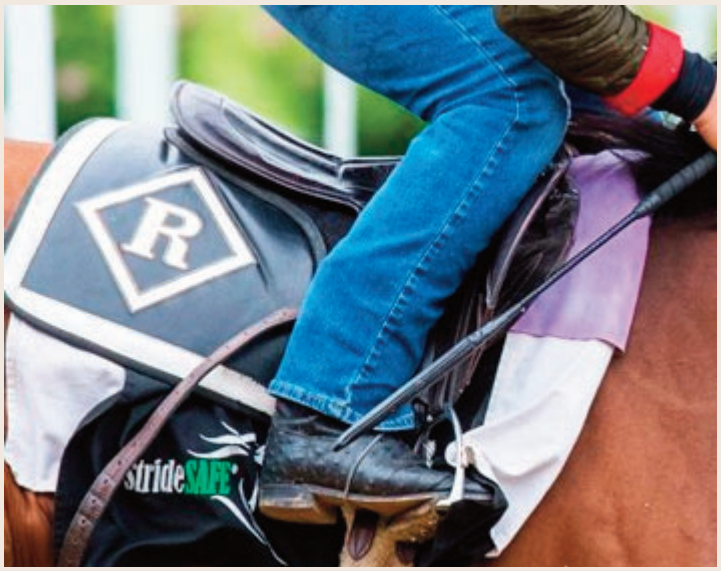
"Racing as a whole should be proud of what it has accomplished – not just in the results that are measured by a reduced fatality rate, but in the way so many in the industry have rolled up their sleeves and made a difference, or just by being open-minded to change.

There's still work to be done, but the progress and the changes in mindset are significant. That's my view from the eighth pole."

Ray Paulick
Paulick Report

WEARABLE TECHNOLOGIES:

Wearable biometric sensors are at the center of the discussion right now with their promise of identifying at-risk horses who might appear sound to the human eye, but which might display subtle lameness at various gaits, including racing pace. "These horses are just starting off at training centers– obviously, they're not allowed onto racetracks until March. Some of these may be sold. Some of them signed up for the study may change hands.



So, if you all of a sudden now have a horse in your barn that you didn't sign up for, we ask that you keep the sensor on them and keep them in the study," Sara Langsam said. "We would like to have a year's worth of information."

The end goal, she said, is for the AAEP to recommend to HISA one or two sensors for nationwide implementation.

Reprinted from Thoroughbred Daily News

Dr. Sara Langsam, chair of the American Association of Equine Practitioners' Racing Committee and Grayson Research Advisory Committee, gave an update at the 11th Welfare and Safety of the Racehorse Summit on current research measures being made to protect the safety of our horses on the track through wearable biometric sensors through an RFP in conjunction with AAEP that went out last November.

"Working in the racing profession, you enjoy when your clients and patients succeed in what they were going for. It's rewarding to see that horse turn around. Ultimately it's respect for the horse, and we're always asking

'Why did this happen,' and finding new ways to do something...but why did this happen, that stimulates new ideas new ways to approach something - someone is always trying to make what we do better, to evolve, to make the sport safer for the horse!

Dr. Sara Langsam
Partner, Teigland, Franklin and Brokken

LUR
LIGHT UP RACING

Light Up racing aims to amplify positive horse racing progress and celebrate remarkable stories while effectively communicating scientific advancements.

They wish to empower participants with the knowledge and confidence to engage in meaningful conversations with the concerned public and external media, and provide the information needed to make informed decisions that prioritize equine welfare.

By fostering industry unity, the goal is to actively work towards driving positive change and pushing for best practice adoption.

5 YEARS LATER AN UPDATE ON SANTA ANITA SAFETY REFORMS

What We Know:

A fetlock arthrodesis program that began in 2020, has been a success. In that procedure, plates and screws are utilized to stabilize a joint by fusing bones, eliminating movement and providing stability. Decades ago, Dr. Dionne Benson, Chief Veterinary Officer of 1/ST RACING, noted that sometimes only the most valuable racehorses went through the procedure. Some felt this fusion could detract from a horse's quality of life. But she said that over the last 4 1/2 years of this surgical program in California, 16 out of 24 horses that have gone through this procedure have "been saved because of it."

What's Next:

Changes that began in California that have spread elsewhere have also led to improvement in safety, Benson said.

Key Take Aways:

"The sport is enjoyable when everyone comes back healthy," said Trainer, Tim Yakteen.

Reprinted from BloodHorse Daily

PANEL DISCUSSION: THE REGULATORY VETERINARIAN AND ATTENDING VETERINARIAN IN THE HISA ENVIRONMENT

What We Know:

Regulatory Veterinarians ability to now see a trainer's equine medical records, along with eyes on the track for morning works has been key in keeping our racehorses safer! "Watching morning training has been a huge help to us in identifying horses that are of concern and preventing those injuries during training–particularly turning horses back that aren't sound," said NYRA Regulatory Veterinarian Sarah Hinchliffe adding how a decrease in equine injuries has correlated to a decrease in human injuries as well.

Photo: Anne M. Eberhardt

What's Next:

Dr. Chip Johnson discussed some of the growing pains from a private practitioner's perspective, touching on the additional paperwork and costs of hiring additional staff to manage that work. There is room for improvement in helping to make our veterinarians' daily jobs easier allowing for the improvements of the welfare and safety for all.

Key Take Aways:

Lyndsay Hagemeyer, Regulatory Veterinarian in the Midwest Region said, "With this racing season, it's been a welcome change. They're used to us being in the barns now."

Chip Johnson, a private veterinarian in Central Kentucky, was more ambivalent in his assessment. "HISA," he said, "has made horses safer."

Reprinted from Thoroughbred Daily News

YouTube

WSS VIDEOS

RACING SURFACE UPDATES: A STRATEGY TO EXPAND AND ACCELERATE SURFACE SAFETY PROGRAMS FOR IMPROVED RACING SURFACE CONSISTENCY

What We Know:

McKinsey's data breaks dirt surfaces into four climate groups: The safest dirt tracks are in hot dry climates (with a 1.31 fatality rate per 1,000 starts), and the dirt surfaces with the worst equine fatality rates are in climates with hot summers and cold, freezing winters (1.53 fatalities per 1,000 starts).

What's Next:

Mick Peterson, executive director of the Racing Surfaces Testing Laboratory has been working on race surface safety and reviewing the various types of surfaces for years .

"I want to mention next generation surfaces," Peterson said. "Right now, we're just looking for consistency. I think there's a really strong argument for consistency. But at some point, we've got to step back and ask: What is the optimum surface for the horse?"

Key Take Aways:

Maintenance, maintenance, maintenance is the key to success in making track surfaces safer! "HISA and the nation's superintendents have made progress in recent years in several important areas, said Peterson, including in grade measurement and maintenance, in racetrack design, and standardized current harrow design."

Reprinted from Thoroughbred Daily News

The current model of the Equine Injury Database (EID) is an idea that traces back to the initial Summit in 2006. "The information it has provided from millions of starts is used to examine 300 possible risk factors that are fed into the model," said Tim Parkin.

"There's so much statistical power here that actually we're now able to [analyze risk factors and the efficacy of safety measures] quite efficiently," said Parkin. "It means that this new model has in excess of 25 statistically significant risk factors in it."

That information has helped the industry craft changes that have led to a statistically significant reduction in equine fatalities in North American racing in the past 15 years. The two most recent numbers are the lowest in that stretch, and the 2023 rate of 1.32 per 1,000 starts is down 34% when compared with 2009. In 2023, 99.87% of flat racing starts at racetracks participating in the EID were completed without a fatality.

(edited from America's Best Racing)

CHECK LIST FOR AFTERCARE AND HORSES RETIRING FROM RACING ON THE VOID CLAIM RULE

Parkin also pointed out how the void claim rule is important, saying that the "most stringent void claim rules at a track reduce the risk by the most degree."

Nor is this just an academic assessment. Ohio veterinarian Lyndsay Hagemeyer described HISA's voided claim rule as having a "really significant" change for the better in the state.

The life of a Thoroughbred horse does not lose its intrinsic value when it is no longer useful from a racing perspective.

Aftercare is important to me because it affords racehorses an opportunity to have enjoyable and productive lives long after they leave the racetrack.

Jeffrey T. Berk, VMD
Equine Medical Associates

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Grayson-Jockey Club Research Foundation

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Food and Environment in hosting

I hope you share my enthusiasm for the successful strides we have made both on and off the track to keep our horses safe.

Without Grayson's assistance to our veterinarians who are helping keep our horses safe, none of this would be possible.

Louis A. Cella
President, Oaklawn Racing Casino Resort

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