



Beyond the Flaring Nostril

When the Breeders' Cup World Thoroughbred Championships was held at Belmont Park recently, not a single horse was wearing a FLAIR® Equine Nasal Strip, a product that was introduced to the horse industry two weeks before the Breeders' Cup at Gulfstream Park in 1999. Invented by veterinarians Jim Chiappeta and Ed Blach,

FLAIR nasal strips caused a bit of a stir when a horse named Burrito won a race at Keeneland Racecourse in October of 1999—at long odds—while wearing a nasal strip.

Similar in design to the Breathe Right® Nasal Strips for people, the equine nasal strips are adhesive strips that hold the nasal passages open. FLAIR strips were

designed to reduce a problem that has plagued racing for decades—exercise-induced pulmonary hemorrhage (EIPH), the condition better known as bleeding. The underlying causes and true incidences of EIPH are still not entirely understood, but large-scale studies have found that more than 50% of Thoroughbred racehorses are affected.



Equine nasal strips were designed to reduce the incidence of exercise-induced pulmonary hemorrhage



The only approved drug for treating bleeding in racing jurisdictions throughout the United States is Salix, which is still widely referred to by its former name, Lasix.

The active ingredient is furosemide, a potent diuretic which increases urine production and consequently, reduces fluid in the tissues and organs of the body. Side effects include dehydration, weight loss, and electrolyte loss, particularly potassium. Salix is strictly regulated. Administration of race-day Salix is a significant factor for bettors. Likewise, types of equipment, such as blinkers and modifications to horseshoes, are also considerations for bettors.

Although designed to help with a physical condition for which a medication usually is given, FLAIR falls into the category of equipment. After scrutiny by various racing jurisdictions to determine whether to allow nasal strips for racing, most approved the use of the nasal strips, and for a while, tracks required their use or removal to be reported in the day's program as an equipment change. Most tracks today have dropped the reporting requirement and permit the strips.

But under the house rule of the New York Racing Association (NYRA), horses are not permitted to race wearing nasal strips, even though the New York State Racing and Wagering Board (NYSRWB), New York racing's regulatory body, permits their use at New York tracks that apply to the board for permission to allow horses to race wearing the strips.

The issue of permitting FLAIR strips at NYRA-operated Belmont, Aqueduct, and Saratoga "is going to be addressed again," said Dr. Ted Hill, The Jockey Club steward at NYRA, who has spoken on several occasions with Chiappetta and Blach regarding FLAIR strips. "Initially, when the product was introduced, the claims were significant and the research to support those claims was somewhat spotty," Hill said. Along with reducing the incidence or the severity of bleeding, the product claimed to decrease the stress of respiration and help delay fatigue.

"The claims kind of got ahead of the product and the regulatory process," Hill said. "The only reason it got bogged down is because people are wagering on the horses. There is that regulatory step that has to be addressed properly."

Whether trainers running horses at NYRA tracks miss not being able to

use the strips for racing is another story. After a flurry of interest, spurred by splashy news coverage related to the long-priced winning horse in Kentucky, FLAIR strips have dropped from the radar in Thoroughbred racing.

Co-inventors Chiappetta and Blach report that three-day event riders have said their horses train and compete more easily when wearing a FLAIR strip. But they are aware that FLAIR has never been well-understood by the Thoroughbred industry.

"What we didn't have when we launched them was a lot of science," Chiappetta said. "We now have lots of science that shows (FLAIR) reduces bleeding. In fact, it reduces bleeding as much as Lasix does."

By "science," he is referring to six published, refereed studies conducted at research centers in the U.S. over the past six years, which resulted in favorable findings for FLAIR strips.



"When we started this product, we didn't realize how little is known about bleeding," Chiappetta said. "As we started researching it, I think FLAIR caused people to look at bleeding a whole lot differently."

Perhaps the time has come to take a new look at FLAIR Equine Nasal Strips and at bleeding.

PRESSURE POINT

The cardiovascular and the respiratory systems work together to deliver oxygen for aerobic metabolism. Ironically, the equine respiratory system—the breathing machinery itself—is the weak link in the horse's oxygen delivery system.

The equine respiratory system is divided into an upper respiratory tract (URT) and a lower respiratory tract. In the upper respiratory tract, conditioning improves the function of the muscles of the

Published Studies on FLAIR Equine Nasal Strips

The first six clinical studies below are listed on the www.FLAIRstrips.com Web site:

Poole, David C., PhD, et al. "Effects of External Nasal Support on Pulmonary Gas Exchange and EIPH in the Horse." *Journal of Equine Veterinary Science*. Volume 20: Number 9, 578-585, 2000. Kansas State University, College of Veterinary Medicine.

Kindig, Casey A. PhD, et al. "Efficacy of Nasal Strip and Furosemide in Mitigating EIPH in Thoroughbred Horses." *Journal of Applied Physiology*. Volume 91: 1396-1400, 2001. Kansas State University, College of Veterinary Medicine.

Geor, Ray J. PhD, et al. "Effects of an External Nasal Strip and Furosemide on Pulmonary Haemorrhage in Thoroughbreds Following High-Intensity Exercise." *Equine Veterinary Journal*. Volume 33: Number 6, 577-584, 2001. Kentucky Equine Research, Inc.

Holcombe, Susan J. VMD, PhD, et al. "Effect of Commercially Available Nasal Strips on Airway Resistance in Exercising Horses." *American Journal of Veterinary Research*. Volume 63: Number 8, 1101-1105, August 2002. Michigan State University, College of Veterinary Medicine.

Valdez, Sandra C., MVZ, et al. "Effect of an External Nasal Dilator Strip on Cytologic Characteristics of Bronchoalveolar Lavage Fluid in Thoroughbred Racehorses." *Journal of American Veterinary Medical Association*. Volume 224: Number 4, 558-561, February 15, 2004. University of California, Davis, College of Veterinary Medicine.

McDonough, P., et al. "Effect of Furosemide and the Equine Nasal Strip on Exercise-Induced Pulmonary Haemorrhage and Time-to-Fatigue in Maximally Exercising Horses." *Equine and Comparative Exercise Physiology*. Volume 1: Number 3, 177-184, August 2004. Kansas State University, College of Veterinary Medicine.

In addition, another published study was presented at the AAEP Convention in 2001:

Goetz, T.E., et al. "Nasal strips do not affect pulmonary gas exchange, anaerobic metabolism, or EIPH in exercising Thoroughbreds." *Journal of Applied Physiology*. Volume 90: Number 6, 2378-85, June 2001. University of Illinois at Urbana-Champaign, Departments of Veterinary Clinical Medicine and Biosciences, College of Veterinary Medicine.



ANNE M. EBERHARDT

Champion Azeri equipped with a nasal strip

Most racing jurisdictions approved the use of equine nasal strips for racing, and for a while, tracks required their use or removal to be reported in the day's program as an equipment change



nostrils, larynx, and pharynx, which hold the upper airway open during exercise. However, the alveoli, pulmonary capillaries, bronchioles, bronchi, and chest wall in the

lower respiratory tract show only minimal response to regular exercise.

In addition to the breathing apparatus mentioned above, the nasal passages are tube-like structures within the skull where air passes after being inhaled through the nostrils. Finally, the diaphragm, a broad muscle located just behind the lungs, is the principal muscle of inspiration. When the diaphragm contracts, air fills the lungs, and when the diaphragm relaxes, air is expelled.

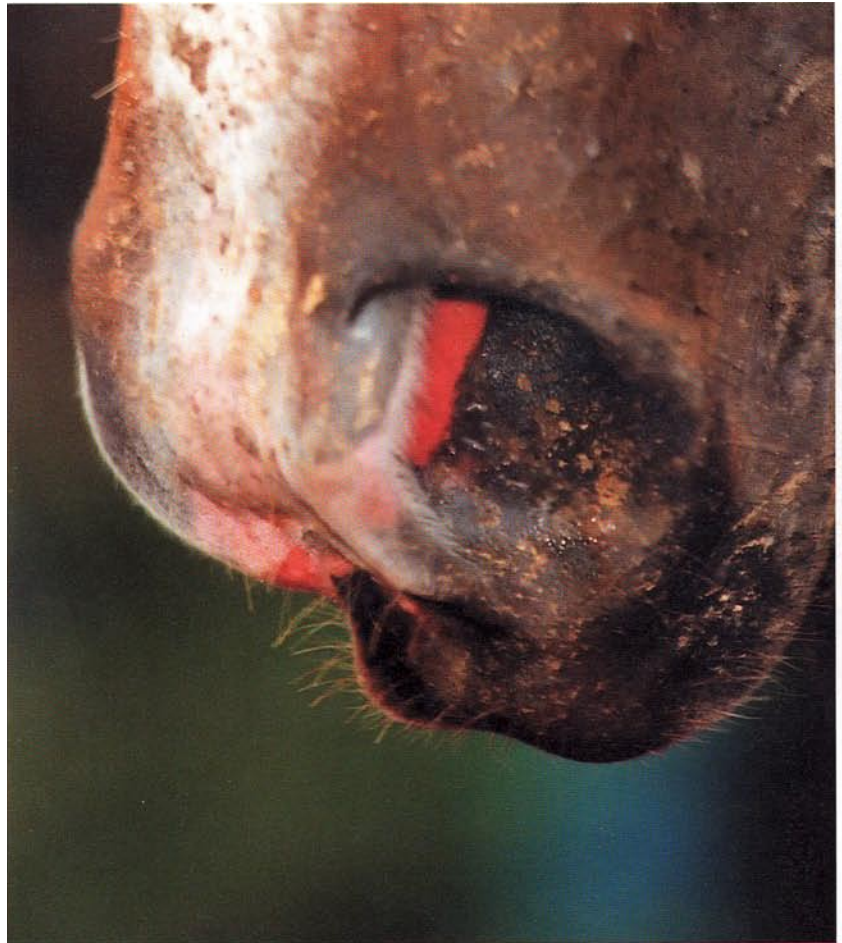
During exercise, the main function of the respiratory system is gas exchange, which takes place in the pulmonary capillaries. When the horse inhales, oxygen from the atmosphere is sent down to the alveoli in the lungs. There, oxygen is diffused into the bloodstream, where it is transported by the hemoglobin in the red blood cells to the muscles for aerobic metabolism to occur and energy to be released. When aerobic metabolism occurs, carbon dioxide and water are produced as waste

products. Carbon dioxide is diffused from the muscle fibers into the bloodstream, where it is carried back to the lungs and excreted through exhalation.

The pulmonary capillaries are very thin membranes. Capillaries are thin in order to allow oxygen and carbon dioxide to pass through them. But being so thin also means that the capillaries are very delicate. They tend to rupture because there is a difference in pressure between air in the airway passage side of the capillaries and blood in the vessels. Quite often, as a result of the opposing pressure forces on the delicate capillaries, blood breaks through and bleeding in the lungs occurs.

"Vessels start out thick from the aorta and they keep coming down until they're thinner and thinner, so it's thin enough that oxygen can cross that membrane. But they're also very fragile. They rupture and blood comes out of the capillaries," Chiappeta said.

"You have a horse that's running full tilt, heart rate up maximal, blood pressure up maximal, and it's coursing through these small capillaries in the lung," he continued. "Now on the other side of the capillaries are the alveoli of a lung. That's where your oxygen exchange is going to be. So the air that's brought in goes to these alveoli, and



For treatment of bleeding, the only approved drug in U.S. racing jurisdictions is Salix

Clinical studies support claims that equine nasal strips reduce pressure on the air side of the blood-airway barrier, reduce bleeding, and lessen the work of breathing

the oxygen moves from within the alveoli across that fragile membrane.

"What's going on to get that air in the lung, the diaphragm is contracting and creating a strong, negative pressure to pull air in, so it fills the alveoli," Chiappeta said. The blood side has a high, positive pressure. "Conditions are kind of ripe for your pressure differential to cause these blood cells to want to go out of the airway."

"You have a push and a pull," Blach said, explaining the blood-airway barrier. "You're actually pushing on the blood side—that gives it high pressure. You have a pull, from the negative pressure, on the airway side."

Bleeding can occur from a small to a significant degree, but once it begins, it feeds on itself. "There are studies that show that when a horse bleeds, the bleeding gets worse because blood is an irritant which causes more damage," Chiappeta said.

Furosemide, the active ingredient in the anti-bleeding medication Salix, is given to draw excess fluid out of the pulmonary capillaries and thereby reduce pressure on the blood side of the blood-airway barrier.

FLAIR works on the other side of the barrier, the airway side.

DIFFERENT TREATMENT

The concept of airway obstruction as a performance restrictor is well-grasped in the Thoroughbred industry. In recent years, veterinarians have focused their attention on other structures in the URT that can be responsible for blocking the airways—the larynx and the soft palate. Part of this is due to the ease of viewing these structures allowed by endoscopic systems that permit vets to study the throat.

"Many racetrack practitioners will tell you that any horse that has a throat problem will have a greater propensity to bleed," Blach said. "If they have a throat problem, they're going to have trouble moving air through that valve. It's another stress point, if you will. If you decrease the effectiveness of the air flowing through that portion of the airway, you are increasing the amount of negative resistance, or negative pressure in the lung."

But nasal passages have been excluded from the discussion of constricted airways, and when the FLAIR strips were unveiled,





Longshot Burrito caused a stir when she won a race at Keeneland in October 1999 while wearing a nasal strip

the initial reaction was skepticism.

"We had an entire veterinary population who had neglected to ever look at this part of the anatomy and its effect on the physiology of airflow in the horse. We had been taught the same thing," Blach said of himself and Chiappeta. "An entire profession had been taught one school of thought on the mechanics of airflow.

"We had always been taught the only place you needed to worry about was the throat," Blach continued. "All the focus had been on the throat; that was the primary point of resistance. Nobody had ever looked at the nasal passages. It had been neglected. That was what spurred us to go on and really investigate this and start gathering medical data about it."

The six studies referred to by Chiappeta show that FLAIR nasal strips support product claims that the strips reduce pressure on the air side of the blood-airway barrier, reduce bleeding, and reduce the work of breathing.



FLAIR, LLC

Dr. Jim Chiappeta and Dr. Ed Blach, the co-inventors of FLAIR® Equine Nasal Strips, are partners in FLAIR, LLC. Chiappeta was a race-track veterinarian who practiced at Canterbury Downs in Shakopee, Minn. He lives in Delano, Minn., and is now a patent lawyer for Boston Scientific Corporation, a medical equipment company which builds cardiovascular devices for people. Blach had a veterinary practice at Littleton Large Animal Clinic, in Littleton, Colo., and later at Alamo Pintado Equine Medical Center, in Los Olivos, Calif. He now lives in Monument, Colo., and is in business as an equine market specialist working with companies in bringing new products to market.

By Bettina Cohen



Nasal strips have fallen out of popularity since their introduction six years ago

A Google search turned up an early study that was presented at the American Association of Equine Practitioners (AAEP) in 2001, which did not yield favorable findings for FLAIR. However, the researchers involved in the study noted that the question remained as to whether the nasal strip actually has an effect on nasal resistance of airflow in horses and added that further studies should be carried out to determine whether this was the case.

Of the six clinical studies involving the FLAIR strips that are posted on the www.FLAIRstrips.com Web site, three were done at Kansas State University, and one each was done at the University of California, Davis; Michigan State University; and Kentucky Equine Research. The publications they appeared in are listed in the sidebar on page 6394.

FRESH START

Six years have passed since FLAIR was introduced to the horse world. At present, it is unusual to see horses come to the paddock wearing a FLAIR strip. In California, where Thoroughbred tracks permit FLAIR strips for racing, Dr. Ron Jensen, equine

medical director for the California Horse Racing Board, said that the paddock judge at Santa Anita had reported to him that “he sees maybe one horse a day come to the paddock with a nasal strip on.”

The early publicity FLAIR strips received, coupled with product claims of reducing bleeding and delaying fatigue which cast the product in the role of a handicapping factor, did more harm than good for FLAIR strips within the Thoroughbred industry.

“We were on the front pages of the *Wall Street Journal* and the *New York Times* sports section with horses that had (won with) long odds,” Chiappeta said. “Unfortunately, that wasn’t a real good message. It was great because it was new and people were excited, but it also said, ‘Here, your horse runs at long odds—put one of these things on and it’s going to win a race for you.’”

The *Times* headline touted FLAIR strips as “the edge.” But although all the horses in the same race might wear a nasal strip, only one horse wearing a nasal strip is going to win.

“But in fact, it’s working on all of them,” Chiappeta said. “We just have



Studies have found that more than 50% of Thoroughbred racehorses are affected by EIPH

a different benchmark of what we're looking for, which is, is the horse healthy?"

It is a curious point that the same standard is not applied to Salix. It is not unusual to see entire fields race on the anti-bleeding medication at tracks across the U.S. every racing day, yet nobody seems to discredit Salix as "not working" when the majority of "Lasix horses" lose.

"The nasal strips have fallen out of popularity, and the best I can tell you is that it's because the Thoroughbred trainers have deemed them not to be working. Whether it's winning more frequently, or bleeding less, I don't know the criteria," the CHRB's Jensen said.



"This device does not make them go faster," Chiappeta said. "It's just another piece of equipment that a trainer has in his tool bag to keep these animals performing at a high level, at their best level."

"We maintain that this is for the health of the horse, and if it reduces bleeding, your horse is going to have healthier lungs, and a horse with healthier lungs is going to perform better," Chiappeta said. "In addition, we have the science that shows it reduces the work of bringing air into the airway. These are ways that we can support what these animals are doing at high speed, to keep them healthier, longer." 