

A REVIEW OF PERMITTED MEDICATION IN THE UNITED STATES

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There is no national regulatory body for horseracing in the United States. Racing rules, including medication rules, are promulgated and enforced by individual state regulatory authorities, which are usually in the form of state racing commissions or racing boards. Currently, there are 38 states that conduct pari-mutuel racing in the United States which means there are 38 racing regulatory authorities with their own medication rules. Often, there are many similarities, but also many differences. It would be disingenuous for the authors of this paper to say that we can represent all opinions on permitted medication, but rather we can only give our views on the subject based on personal experiences and observations.

The move toward liberalised use of therapeutic medication in the United States was well intended and advanced for several reasons. In the early 1970s, racing in several jurisdictions in the United States went from being conducted on a seasonal basis to racing during the entire year. Some of the more prominent leaders in the racing industry, horsemen and veterinarians, expressed the need for use of a few medications to assist horses in training to overcome relatively minor injuries. The thought was that the judicious use of some therapeutic medications would allow the horse to stay in training year around. In other words, these therapeutic medications would take the place of rest and recuperation. The justification for change seemed reasonable. Racing on predominately dirt surfaces, in all weather and track conditions, placed physical demands on American horses far beyond those experienced by their international counterparts. Horses raced more often and the resultant musculoskeletal insults were preventing them from performing to their inherent ability. The injuries were minor to moderate, nothing serious requiring surgery or extended rest for proper healing. Horseracing should have the benefit of newer, reportedly innocuous medications, particularly as they are beneficial and not intended to affect performance.

In addition, there was pressure on management in many jurisdictions to extend their racing dates to keep pace with competition and rising operating costs. Also during this period, analytical methodologies were becoming more sensitive, and the policy of strict zero tolerance for drugs considered to be therapeutic received criticism and pressure for modification.

To accommodate this increased demand, some changes in medication policy were deemed essential. Acceptance of these changes was facilitated by the precept that the medications were in the best interest of the horse and they were intended for use in training, not for race day administration. This is a critical distinction, and it is important to remember that the original intent was that permitted medications, with the exception of furosemide, were to be used to allow horses with minor musculoskeletal problems to remain in training. They were not intended for indiscriminate use or for use in racing.

There are only a few therapeutic medications that are included in permitted medication programmes in the United States.

Corticosteroids were the first category of drugs to be widely accepted in the industry for their significant anti-inflammatory action. They were used for a variety of conditions and could be administered safely by several routes. Although there were some concerns and anecdotal information that such broad use of corticosteroids would be masking injuries and lead to new and more extensive damage to joints and soft tissues, it would be years before evidence of the detrimental effects on articular cartilage would be documented.

Corticosteroids were never regulated by allowing a specific level in the post race sample, and racing regulators did not ask their laboratories to rigorously test for these substances. When they were reported, the resulting penalties were modest.

Arguably the 2 most significant permitted therapeutic medications in the United States,

phenylbutazone and furosemide, were introduced to horseracing during the late 1960s. Phenylbutazone, or bute as it was quickly labelled around the track, was the first medication to be permitted under regulated conditions. Phenylbutazone proved to be an extremely effective anti-inflammatory agent. It was fast acting, had a rather wide range of dose activity with very low toxicity, provided marked pain relief and could be administered by injection or orally. Proponents reasoned that it would lead to a substantial decrease in the use of corticosteroids.

Veterinarians soon discovered that the analgesic properties for treating musculoskeletal pain were even greater than anticipated for this non-steroidal anti-inflammatory. The literature indicated that the analgesia resulted from its anti-inflammatory properties, but the correlation was not that clear. Horses with small nondisplaced fractures sometimes responded remarkably with only a single 4 g dose.

The implications were obvious. Used judiciously, phenylbutazone was a valuable aid for the equine practitioner, assisting horses with relatively minor injuries to return to training under careful supervision. Unfortunately, the anecdotal information of its analgesic qualities was rapidly disseminated among horsemen and a few veterinarians with less noble intentions. More serious injuries could be masked by daily administrations, often given orally by the trainer with little or no knowledge by the veterinarian and owner. Horses that should have been given extended periods of rest or required surgical intervention for proper healing were kept in light training and aimed to cheaper claiming races or pointed to specific major races to enhance their value before retiring.

Drug testing was not far behind. The most celebrated case of a phenylbutazone positive was the 1968 Kentucky Derby winner, Dancer's Image. The veterinarian involved paid a modest fine, and the disqualification was upheld after several years on appeal (Heller 2002). It is interesting to note that jurisdictions soon began to legalise 24 or 48 h administration and even race-day use of phenylbutazone. This move was partially due to pressure by horsemen and veterinarians and somewhat to avoid unpleasant and costly positives.

As previously mentioned, there is no national regulatory body in the United States. However by the early 1970s, phenylbutazone had been legalised in most states, and by 1975 its regulated use was well established. In most states, residues of phenylbutazone in equine urine were permitted as long as the sum of the concentrations of

phenylbutazone and its major metabolites did not exceed 165 µg/ml. The Veterinary Chemists Advisory Committee to the National Association of State Racing Commissioners (NASRC), which has been renamed The Association of Racing Commissioners International (ARCI), reviewed the status of phenylbutazone in 1977 and submitted a report to the NASRC. The report concluded that phenylbutazone could not cause a horse to exceed its natural capacity and had no ability to stimulate unusual or exceptional performances. The report noted that under some circumstances phenylbutazone could interfere with screening for other drugs, especially if administered within 24 h of racing.

In the late 1970s and early 1980s, the use of phenylbutazone in racing came under intense attack, especially by the Humane Society of the United States (HSUS). Pressure from the HSUS took the form of testimony before racing commissions regarding the ability of phenylbutazone to interfere with the detection of prohibited substances and its own ability to suppress pain and thus lead to further damage. This pressure led to the introduction of legislation to the United States Congress known as The Corrupt Horse Racing Act. The racing industry united in opposition to this legislation and the act was never passed. However, this led racing jurisdictions to review their rules, and many elected to tighten those rules.

In an attempt to bring some science and order into this process, the NASRC established a Blue Ribbon Committee to define an equitable, scientifically correct, and politically defensible post race level or residue for phenylbutazone in the blood of racing horses. The committee declared 2 µg/ml in serum to be the appropriate post race level and established this as the NASRC recommended tolerance level. This level was recommended by the NASRC to state regulatory authorities as the proper level used to regulate the use of phenylbutazone. One of the reasons offered for this value was that concentrations of phenylbutazone in equine blood greater than this value could be associated with a masking or interference effect in urine testing. Additional work was done on the problem of masking by phenylbutazone in equine urine testing in the early 1980s. In 1986, the 2 µg/ml regulatory value was reviewed, and it was concluded that this value could be raised to 5 µg/ml; without increasing the level of interference caused by the presence of phenylbutazone and its metabolites in urine (Gowen and Lengel 1993). Currently, the majority of state racing authorities, but not all, utilise the 5 µg/ml limit with a 24 h withdrawal

prior to racing, and this is the level and time frame for administration recommended by the Racing Medication and Testing Consortium (RMTC).

The use of furosemide in horses was first documented in a 1967 issue of *Veterinary Medicine/Small Animal Clinician*. The article, 'Furosemide in Equine Practices', was written by 3 veterinarians (M.C. Beeman, Charles Vail, Harry Johnson) and disclosed that they had been using this new drug as an injectable diuretic in clinical trials for 2 years. Interestingly, the summary noted 3 conditions in which furosemide therapy has been consistently good, ie laminitis, myositis and as a placebo (urine collection), but there was no mention of exercise-induced pulmonary hemorrhage (Heller 2002).

Furosemide use as a treatment for EIPH probably began in the late 1960s or soon thereafter, although it is not documented. During the later part of the 1970s, some analysts began to voice concern about the effects of furosemide on the detection of other drugs in the post race urine samples. It should be remembered that, at this time, analysts were screening samples utilising thin layer chromatographic (TLC) methods. A study was designed and undertaken by analysts representing 7 laboratories in the United States. Twelve drugs from various chemical and pharmacological classes were administered to horses by various routes and dosages. Furosemide was then administered at doses of 0.5 to 1.0 mg/kg at various times before and after these drugs were administered. Urine samples were collected from the horses, divided, and sent to the 7 laboratories where they were analysed by TLC. The analysts reported that the administration of furosemide did result in some degree of interference in the detection of some of these drugs for as long as 6 h.

When the results of this study were reported to the NASRC, it caused considerable alarm among racing regulators, and during the 1981 NASRC Convention, the NASRC voted to recommend that furosemide be banned from racing with 24 jurisdictions voting in support of the ban, 3 abstaining and one 'not present'. However, when the delegates returned to their home states, only 2 states, Illinois and Ohio actually took action to ban furosemide. The horsemen in those states immediately went on strike and refused to race their horses. At that period in time, the only legal wagering on horse racing was at a track operating live racing; there was no off-track or simulcast betting. Therefore, there was no economic income to any of the participants in the racing industry in those states while horsemen were on strike. This action led to intense bickering and debate,

including legislative action and in a few days, furosemide was approved as a race day medication. In Illinois this approval came with the condition that only horses that were confirmed bleeders could race with furosemide and that the treatment would take place in a detention barn where the horse would remain until going to the post.

Also, at about this time, the American Association of Equine Practitioners (AAEP) made the recommendation that furosemide be permitted as a race day medication and further recommended that the dose should be 250 mg per horse and should only be administered by iv injection. The AAEP recommendation further stated that furosemide should not be given later than 4 h prior to racing. This led to a repeat of the previous study on the detection of other drugs following the administration of furosemide, but this time the furosemide was given only at the dose and route recommended by the AAEP. In this study samples were analysed at Cornell University and the Ohio State University. It was concluded that furosemide did not interfere with the detection of any of these drugs if the dose of furosemide was 250 mg and the route of administration was iv (Harkings *et al.* 1998).

The detention barns previously mentioned proved to be costly and inconvenient for horsemen, especially for smaller stables with limited manpower and gradually were discontinued. However, there has been renewed interest in utilising detention barns for all horses entered to race, going beyond the concern with furosemide. The New York Racing Association began this practice in the summer of 2005.

Today, more than 90 per cent of Thoroughbreds and Quarterhorses receive furosemide to race, and the numbers are even higher in some jurisdictions. Standardbreds average about half this amount, but the percentage is increasing. New York was the last state to legalise its use in September 1995, just in time for the Breeders' Cup at Belmont Park. Furosemide may be the quintessential example of good intentions gone awry with therapeutic medication. The arguments presented seemed reasonable at the time. Research had demonstrated that most Thoroughbreds bleed at some point in their career, even if the amount is quite small based on endoscopic examination. Horses were bypassing New York to race in states that allowed race-day furosemide. Management would benefit from increased field sizes and overall handle, the horsemen and veterinarians would be satisfied, and of course, the horse would benefit. Throughout the 1980s, the NYRA tracks had close to 25,000 starts each year. The number of horses with epistaxis never exceeded 60 a year, although

certainly many more experienced episodes of EIPH that were not visible on the track. The degree of pulmonary hemorrhage sufficient to impair performance still eludes us.

The costs of regulating furosemide are substantial. A private veterinarian administers furosemide in many jurisdictions; it is given iv within a specific dose range and time frame. A track employee must be assigned to confirm bleeder certificates, programme information and treatments at the appropriate times. Records must be updated daily. Misadministrations occasionally result in late scratches and fines for the trainer and/or veterinarian. The drug-testing laboratory must quantify furosemide levels in blood and report overages for regulatory action, a time consuming and costly process. Collectively, this represents a considerable effort to regulate a race day medication of questionable value.

From the patron's perspective, furosemide information is considered quite valuable for handicapping. The notion that it improves performance, particularly for horses on it for the first time, is well established. Whether this is due to controlling EIPH, a significant water weight loss shortly before racing, or some other as yet unidentified factor is immaterial to the punter (Freestone *et al.* 1988). The end result is the only thing relevant. If the research and recommendations are valid, one must wonder how horses managed without furosemide in the United States for so long.

While phenylbutazone and furosemide are by far the most common permitted medications in the United States, a few states do allow others. The Racing Medication and Testing Consortium (RMTC) has developed and proposed model medication rules that provide for the use of one of 3 NSAIDs. The permitted serum or plasma thresholds are: phenylbutazone - 5 µg/ml, flunixin - 50 ng/ml or ketoprofen - 10 ng/ml. These concentrations are consistent with administration by a single iv injection at least 24 h before the scheduled post time. A few jurisdictions have permitted such medications as acepromazine, glycopyrrolate, detomidine and corticosteroids with a 24 h withdrawal.

What effect has permitted medication had on horseracing in the United States? It is difficult to measure the effects of one factor such as permitted medication while eliminating all of the other possible contributing factors. While it is difficult to determine the role of permitted medication, field size and the average number of starts per horse per year certainly have not increased. In 1960 the average field size of races in the United States was 8.95 and the average horse made 11.31 starts per

year. Last year, 2005, the average field size was 8.17 runners per race and the average annual starts per runner was 6.45 (The Jockey Club 2006). Again, it cannot be stated with certainty that permitted medication was the sole cause of the decrease in these averages, but the fact is, field size and number of starts per runner annually have been decreasing since 1960. In addition, one cannot conclude that permitted medication has caused the collapse of our racing industry. American bred horses still race well and our horse sales continue to attract international buyers. Top American bred bloodstock, yearlings, and 2-year-olds still command healthy prices as evidenced by the recent sale of a 2-year-old in training purchased by an international racing stable for 16 million US dollars.

The early proponents of permitted medication recognised that the improvement in laboratory methods and the resulting increased sensitivity made the policy of zero tolerance for therapeutic medications problematic. They argued that in the interest of fairness for owners and trainers and for the benefit of the horse, some sort of thresholds or tolerance levels needed to be established for certain therapeutic medications. Over the years this argument has been more or less accepted throughout much of the racing world. Beginning with the Cambridge ICRAV, considerable efforts are being made by various national and international organisations to establish fair and reasonable threshold levels and withdrawal guidelines. The approach and terminology applied in establishing these levels and guidelines vary from country to country, but the goal is the same.

Horseracing in the United States today has at least one generation of trainers, veterinarians, breeders and owners who have never experienced racing without permitted medication. Many of these individuals feel that medication is an essential part of training and racing. In some instances, this philosophy has caused the use of both permitted and other therapeutic medications to be automatic and trivialised, with little thought given to necessity or possible long-term effects. This philosophy has led to the increased use of medication as a substitute for rest and recuperation. As previously mentioned, it has unfortunately contributed to the practice of utilising medication to disguise soundness problems, thus keeping horses in light training and racing with the intention of passing the problem to another horseman or artificially inflating their value before retiring. In our opinion, this has been the major downside of permitted medication, causing career ending and catastrophic damage to individual horses.

While the use of permitted medications in racing in the United States is well established, the regulation of permitted medications will undoubtedly be altered based on the research and recommendations of the national and international organisations.

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REFERENCES

- Freestone, J.F., Carlson, G.P., Harrold, D.R. and Church, G. (1988) Influence of furosemide treatment on fluid and electrolyte balance in horses. *Am. J. vet. Res.* **49**, 1899-1902.
- Gowen, R.R. and Lengel, J.G. (1993) Regulatory aspects of drug use in performance horses. *Vet. Clin. North Am. equine Pract.* **3**, 3.
- Harkins, J.D., Carter, W., Hughes, C.G. and Tobin, T. (1998) *Furosemide in the Horse, its Actions, Effects, and Regulatory Control*. Wind Publications, Lexington, Kentucky.
- Heller, B. (2002) *Run, Baby, Run. What Every Owner, Breeder & Handicapper Should Know About Lasix in Racehorses*. The Russell Meerdink Company, Ltd., Neenah, WI
- The Jockey Club 2006 Fact Book*. Lexington, Kentucky.