

A METHOD FOR MEASURING BIT-INDUCED PAIN AND DISTRESS IN THE RIDDEN HORSE

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ABSTRACT

Between 2002 and 2008, using a psychometric approach, 56 controlled experiments with one variable were conducted by riders who switched their horses from a bitted to a bitless bridle and documented before-and-after behavior. Riders entered data on a check sheet listing 105 unwanted behaviors in 8 categories. They first checked, in column one, the unwanted behaviors they had recognized since owning the horse (median period 2 yrs, range 9 months – 21 yrs), when worked in its usual bitted bridle. In column two, after similar work in a crossunder bitless bridle, with the same rider, for a variable period (median 3 months, range 1 day - 2 yrs) they checked any unwanted behaviors that remained. Horses were of different ages (median 8 yrs, range 3 -24 yrs); of many breeds; and used for one or more disciplines, e.g., dressage, jumping, eventing, endurance, trail and pleasure.

55 of the 56 horses showed significantly fewer unwanted behaviors when bitless. The number of unwanted behaviors when bitted ranged from 5 to 60 (median 32); when bitless - zero to 16 (median 2). The difference was highly significant (Wilcoxon W = 1770, estimated difference = 22, $p < 0.001$). Not less than 94% of the unwanted behaviors were caused by the bit. The caveat 'not less' is added because half the check sheets were completed within three months of removing the bit, several in the first week. In these cases, insufficient time had elapsed for chronic bit pain to have abated, e.g., the many unwanted behaviors associated with bit-induced trigeminal neuralgia.

Bit-induced pain and distress was measured by assigning a score of one to each unwanted behavior and subtracting the bitless score from the bitted. The median pain and distress score was 30, i.e., 30 unwanted behaviors were eliminated by removing the bit. Individual scores were prefaced by the amount of time the horse had been bitless, as short trials of bitlessness showed lower scores.

The measure of bit-induced pain and distress can be broadly defined as the difference between the number of unwanted behaviors when bitted and bitless

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The unwanted behaviors eliminated by switching from bitted to bitless were normal, (albeit inconvenient for the rider) physiological responses to pain and fear. They included many that result in accidents and injuries to horse and rider, e.g., nervousness, spooking, bolting, bucking, rearing, and balking. The welfare and safety of 56 horses and their riders was statistically improved by removing the bit. Education in pain recognition is needed to promote equine welfare and rider safety.

KEYWORDS: pain, behavior, bit, bitless bridle, horse

INTRODUCTION

I have three confessions to make. First, all my riding in years past was done in a bitted bridle - much of it in a double bridle.

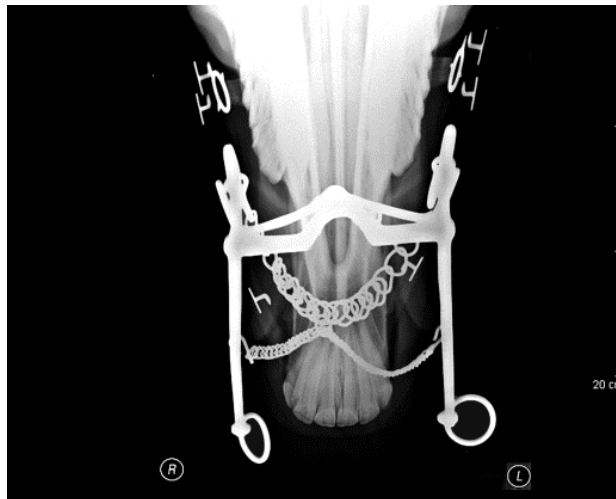


Figure 1: Dorso-ventral radiograph of the equipment mandated by the FEI and national federations for the upper levels of dressage

Secondly, though my primary field of research was the ear, nose and throat of the horse, 40 years sped past before I asked myself the question, 'What does a bit really do to a horse?'



Figure 2: “Various means of forming that which most men speak of with admiration as ‘a good mouth.’” (Mayhew, 1860)

Born in England, in 1930, I grew up thinking of the phrase “bridle-and-bit” as one word. Long after - and at a time when I should have known better - I still accepted the bit without question. Unconsciously, I granted a free pass and exemption from inquiry to this invasive and pressuring device in a body cavity. In blissful ignorance, for example, I subscribed to the myth that the horse as a species might have half a dozen aversions to the bit, that occasionally an individual horse may exhibit one or two, and, if it did, that this was somehow the horse’s fault.

Mayhew’s drawing illustrates nearly all of the aversions I knew about. Little did I imagine that I would come to recognize that there were well over a hundred aversions to the bit, forty or more bit-induced diseases and that aversion to the bit is the norm rather than the exception to the rule.

As a researcher I had looked in vain for the root cause of headshaking, palatal instability, and ‘bleeding’ in the racehorse. Yet all this time it had been staring me in the face, hiding in plain sight



Figure 3: For the racehorse, a tongue-tie is allowed. It is used in the hope of preventing unwanted behavior, caused in the first place by the bit

I am now of the opinion that the bit is the major cause of these and other diseases, of many unwanted behaviors, of equestrian accidents, poor performance, negative equine welfare and a great deal of rider unhappiness and injury

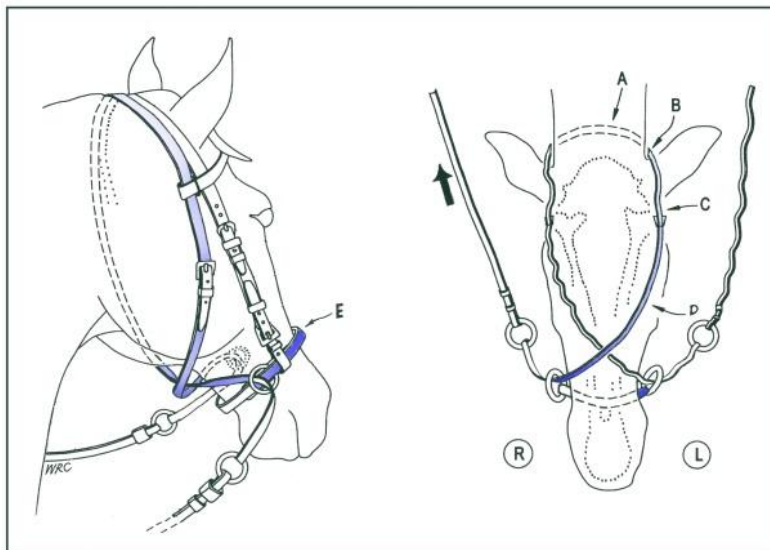


Figure 4. The crossunder bitless bridle. The diagram on the right is a worm's eye view

Thirdly, I declare a conflict of interest. For the last 15 years, I have promoted an alternative to the bit that provides a humane, more effective and safer rein cue with

none of the bit's many and dangerous side-effects. The interest is not in conflict with the oath I swore in 1952 on graduating as a veterinarian – to promote the welfare of animals.

As an equine surgeon, I used to provide surgical solutions for a limited number of problems, say three times a week, one horse at a time. Now I provide an equipment solution for a much wider range of problems and can help a dozen horses a day.

Confessions over, I wish to describe a series of experiments in which 56 riders switched from a bitted to a bitless bridle and documented their horse's before-and-after behavior.

The experiments had two objectives:

1. To test the hypothesis that unwanted behaviors of the ridden horse would not become less numerous when a bit was replaced with a crossunder bitless bridle.
2. To test a method for measuring bit-induced pain and distress in the ridden horse.

MATERIALS AND METHOD

Riders completed a questionnaire listing 105 unwanted behaviors of the ridden horse. They first checked, in column one of the questionnaire, the unwanted behaviors they were familiar with when riding their horse in its customary bitted bridle. In column two, they checked the list again after similar work in a crossunder bitless bridle

- The second column was completed after horses had been bitless for periods ranging from one day to 2 years, with a median period of 3 months
- Each unwanted behavior was assigned a numeric value of one.
- Bit-induced pain and distress was measured by subtracting the number of unwanted behaviors when bitless from the number when bitted.

In the sample questionnaire, 9 unwanted behaviors minus 2 gives a bit-induced pain and distress score of 7 (see 'Results' for further comment).

CATEGORY	BITTED Y/N	BITLESS Y/N	SCORE Bit P & D
FEAR			
FRIGHT: Spooky, shy	Y	N	X
FLIGHT: Bolting, rushing	Y	N	X
FIGHT: Resistant, slow response to cue	Y	N	X
FREEZE: Napping, planting feet	Y	Y	
OTHER RISK OF ACCIDENTS			
Difficult to mount, fidgety	Y	N	X
Bucking or bounding	Y	N	X
Rearing	N	N	
Falling down and sudden death	N	N	
Difficult to steer, 'lugging'	Y	N	X
Premature fatigue	Y	N	X
Stumbling	Y	Y	
Bit-induced PAIN & DISTRESS SCORE	9	2	7

Table 1. Sample questionnaire

Table 1 shows the first two categories of the questionnaire, together with representative answers and the bit-induced pain & distress score that would have been assigned

THE QUESTIONNAIRE

The questionnaire was based on feedback received in the previous four years from riders who had already made the switch from bit to bitless. Unwanted behaviors were listed in eight categories (Table 2), the behaviors ranged from the regrettable to the life-threatening

1. FEAR: Fright, flight, fight, freeze
2. Other warning signs of heightened risk
3. Anxiety prior to riding and discomfort after
4. Pain and distress caused directly by the bit
5. Signs consistent with trigeminal neuralgia
6. Interference with breathing
7. Interference with stride and schooling problems
8. Rider's feelings: indicators of the horse's feelings

Table 2. The eight category questionnaire

The complete questionnaire is available online at http://bitlessbridle.com/FOTB_Q.pdf

THE RIDERS

The rider/experimenters were volunteers. Having already purchased a crossunder bitless bridle they asked to be sent the questionnaire. They were not conscripted, paid or selected and they lived in many parts of the world.

THE HORSES

AGE	Median age 8 years (range 3-24 years)
BREED or TYPE	Diverse (mainly T'breeds and Warmbloods)
GENDER	36 geldings, 20 mares
TIME OWNED	Median time 2 years (range 9 months to 21 years)

Table 3. Signalment of the study population

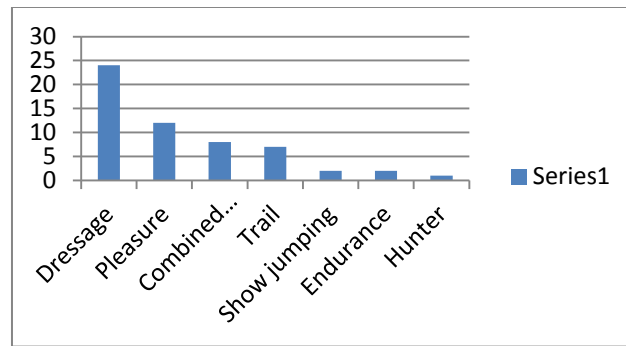
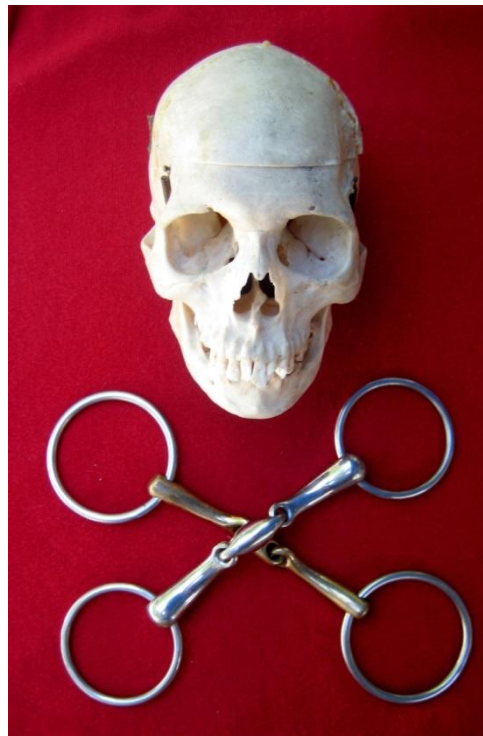


Table 4. Number of horses in each discipline

43% of the 56 were used for dressage, 20% were pleasure horses and the rest were used for other disciplines.



A great variety of bits had been used.

RESULTS

Objective #1: 55 out of 56 horses showed significantly fewer unwanted behaviors when bitless. The hypothesis was refuted

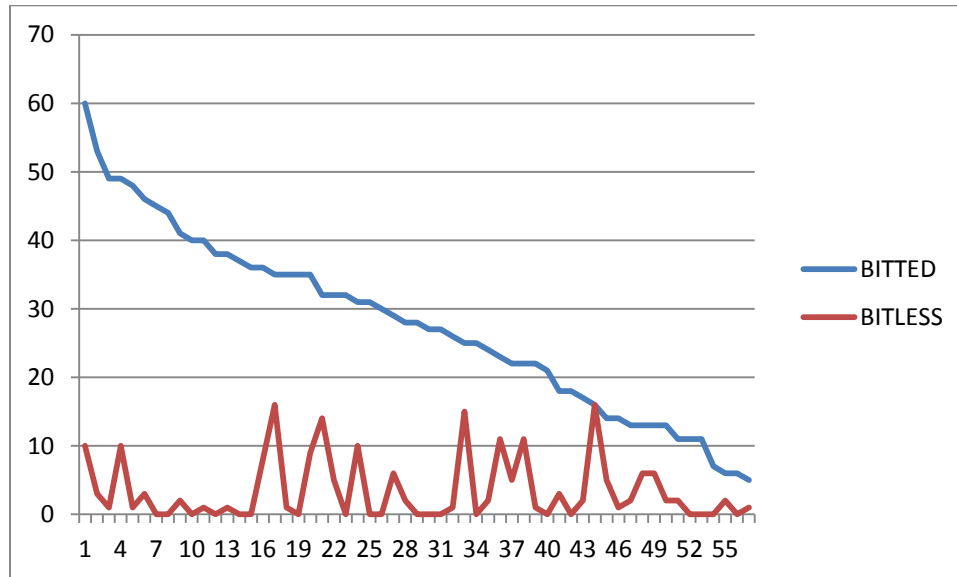


Table 5. Case data sorted in descending number of unwanted behaviors when bitted, from 60 to 5 when bitted (blue line) and 16 to zero when bitless (red line)

Only one horse showed the same number of signs when bitless as when bitted (c. 44)

	TOTAL NUMBER OF UNWANTED BEHAVIORS IN THE STUDY POPULATION	RANGE OF UNWANTED BEHAVIORS SHOWN BY INDIVIDUAL HORSES	MEDIAN PAIN & DISTRESS SCORE FOR THE WHOLE POPULATION
BITTED	1643	5-60	32
BITLESS	202	0-16	2

Table 6: Unwanted behavior data for the study population

Based on the total unwanted behaviors there was a 94% improvement when bitless. The median bit-induced pain & distress score was 30 (32 minus 2). More precisely, this should be expressed as not less than 30 as the one horse that showed no improvement after a month may have improved had it been assessed after a longer period.

This time factor applies in particular to the sometime slow-to-regress pain of bit-induced trigeminal neuralgia and its associated unwanted behaviors of head tossing, muzzle rubbing and other signs.

Not less than 91% of unwanted behaviors were caused by the bit

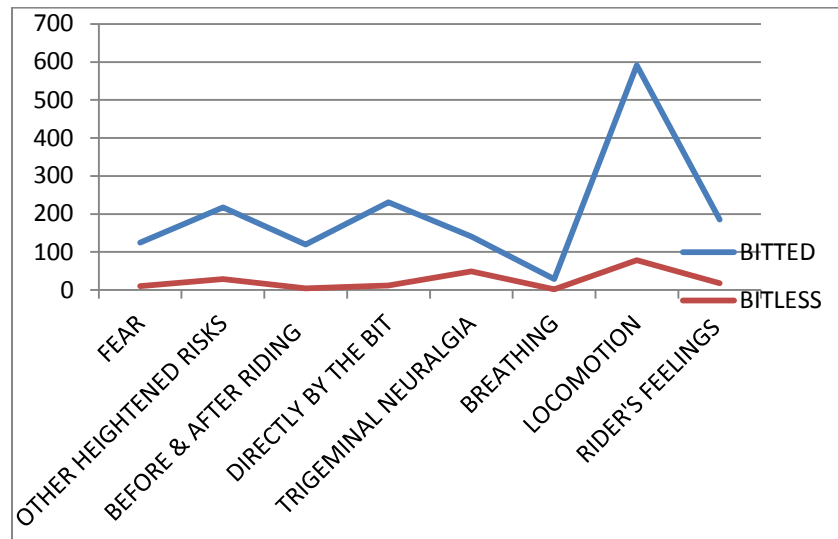


Table 7: Number of unwanted behaviors by category when bitted (blue line) and when bitless (red line)

Table 7 shows how a small rod of metal in the mouth has a large negative effect on the legs. This is especially obvious in the locomotion category but legs are very much involved in the first three categories too. It also shows how the unwanted behaviors were substantially reduced in every category

STATISTICAL ANALYSIS
Wilcoxon W = 1770, estimated median difference = 22, p<0.001

The difference between bitted and bitless numbers indicated a very low probability of this occurring by chance.

Objective #2: The measure of bit-induced pain and distress was time, quantity, and percentage dependent. The three features were expressed numerically, for example, as

$$2 \text{ year: } 60 - 10 = 50 \text{ (83\%)}$$

The numbers explain that ...

- after two years of being bitless
- unwanted behaviors were reduced from 60 to 10
- the bit-induced pain and distress score was 50.
- 83% of the unwanted behaviors were caused by the bit.

CASE #	AGE (years) at time of review	TIME BITLESS	UNWANTED BEHAVIORS WHEN BITTED	UNWANTED BEHAVIORS WHEN BITLESS	Bit-induced PAIN & DISTRESS SCORE	% REDUCTION in unwanted behaviors
36a	10	2 years	60	10	50	83
36b	18	10 years	60	0	60	100
7a	9	5 days	35	16	19	54
7b	10	9 months	35	1	34	97

Table 8: Data for two horses that were reviewed twice. When bitted, as an 8 year-old, Case #36 was 'dangerous' and euthanasia was considered. After being bitless for 2 years she was reclassified as 'a challenging mount.' After another 8 years, a long-term report stated that during this period she had become 'completely reschooled']

The need for a time prefix for the score is illustrated by the results obtained by two riders who completed the second column of the questionnaire twice.

For example, looking at the yellow rows, a 5 day bit-induced pain & distress score for a 9-year-old Thoroughbred was 19 with only 54% of the unwanted behaviors eliminated, whereas the 9 month score was 34 with 97% eliminated.

The caption tells the story for the other horse.

As 55 out of 56 horses (98%) showed a significant lessening of unwanted behaviors when the bit was removed it was concluded that aversion to the bit was the norm in this population.

DISCUSSION

Riders discovered that their horse showed many more signs of bit-induced pain and distress than they expected. The unwanted behaviors eliminated were normal physiological responses to pain and fear. Regrettable character traits that riders assumed to be inherent were among those to be eliminated. Many of the eliminated signs were those associated with accidents.

15 years of experience in switching horses from bit to bitless leads me to the opinion that this sample of the horse population is reasonably representative of the whole. The

non-disclosure-of-pain policy that the horse is credited with does not apparently apply to bit-induced pain. A horse that failed to react negatively to bit-induced oral pain would be a very unusual horse.

Not only does a rider or driver not need a bit but its presence is a blight on a horse's life, a hindrance to man's communication with the horse, a source of accidents and a handicap to performance.

The first take home message is that a rider who believes that her bitted horse is not exhibiting pain or distress is probably failing to recognize the signs. Unless a rider first removes the bit and gives her horse the opportunity to show to an impartial judge that no improvement occurs in behavior, performance and rider/horse harmony, such a belief lacks credibility.

A second take home message comes from a cost benefit comparison from the point of view of each athlete.

First the horse's point of view (Table 9)

COST	BENEFIT
FOR THE BIT	
Multiple pain & distress side-effects. Including many bit-induced diseases	NONE
Rein cues frequently frighten	
Heightened risk of injury	
Difficulty in breathing	
Reduced athletic ability	
Loss of rapport with rider	
FOR THE CROSSUNDER BITLESS	BRIDLE
NONE	No side-effects, no pain from or fear of bridle. No bridle-induced diseases
	Rein cues more readily understood
	Far less likely to be injured
	Athletic ability less hampered
	Good sense of partnership with rider

Table 9: Cost/benefit analysis - the horse's point of view

And now the rider's (Table 10)

COST	BENEFIT
THE BIT	
Your horse suffers pain and distress	Approved for dressage
Rein cues are often misunderstood or resisted	
You and your horse's safety are at heightened risk	
As a rider you are rendered less competent	
Your joint athletic performance is compromised	
Your horse may develop bit-induced diseases	
Your horse's life may be shortened	
The expense of keeping a horse increases	
You may no longer enjoy riding	
THE CROSSUNDER BITLESS BRIDLE	
Not approved for dressage	You and your horse are in harmony

Table 10: Cost/benefit analysis – the rider's point of view

For the rider, the bit has one benefit, its approval for dressage under a century-old rule. But this comes at great cost to the horse.

The crossunder bitless bridle, has one 'cost' only – it cannot be used for dressage under current rules. This denial should, for the welfare and safety benefits it can bestow on both horse and rider, be lifted without delay.

For horse sport and racing administrations to mandate the use of a harmful device makes no sense. Apart from the damage they do to their own sport, their example is followed by Pony Club and 4H organizations with the result that young riders are also exposed to unnecessary risk and their horses to unnecessary pain. If riders in all disciplines were given the option to use an ethical and humane rein cue such a reform would be a landmark in the history of the horse.

ACKNOWLEDGMENTS

Without the feedback from riders, the experiment could not have been conducted and I am deeply indebted to the early bitless pioneers. Dr. Daniel Mills very kindly supplied the statistical analysis.

OPEN DISCUSSION

After 5000 years without any questions being asked about the bit it was not easy to cover the topic in the allocated 12 minutes. In the open discussion, three points were raised and I will take this opportunity to respond to each of them.

A rider told me that his horse had jumped five feet in a crossunder bitless bridle. He continued, however, by saying that he could 'do more' with a bit in his horse's mouth. If time had permitted, the counter question I would have posed in answer to his was to ask, "At what cost?" If I wanted to move a man from A to B, I could do this more effectively if I pressed the barrel of a gun into the small of his back. But, though my victim might move with alacrity, it does not follow that he would do this more gracefully, willingly or without resentment. So the supplementary question has to be asked to evaluate the cost/benefit equation of 'doing more' with a bit (if indeed this is the case), 'What is the downside of such a method?' If 'more' can be achieved but only at the cost of pain, distress and added risk, is the objective justified?

Another contributor to the discussion suggested that, as the volunteers who answered the questionnaire were riders whose horses presumably exhibited aversion to the bit, this automatically introduced a bias into the population examined, it not being a random population. But as I remarked in my paper, most of the volunteers were surprised at the extent of the unwanted behaviors that were eliminated by removing the bit. These were riders that were still largely unaware of the true extent of their horse's bit aversion. For example, a dressage rider who had owned her 11 year-old Warmblood for 7 years before switching to bitless commented, *"If you had told me beforehand that, after 6 rides in a crossunder bitless bridle I could solve 37 of 38 problems, I would have laughed in your face."* The conclusion I draw from the study is that all horses are averse to the bit but, as riders, we have not been recognizing the signs. In other words, a supposedly random population would still be comprised of horses that were averse to the bit.

Evidence from a similar and independent series of experiments carried out in 2007 on a 'closer-to-random' population supports my conclusion. The CEO of a riding centre with 27 horses made the decision to switch all her horses from bit to bitless and to monitor the results using the same questionnaire. Two non-riding coaches made the assessments over a period of 8 months as each horse (with different riders) was transitioned. 77% of unwanted behaviors were eliminated. Recognizing that the assessments were not as searching as those carried out by the riders themselves in my series, this figure is consistent with the 94% elimination I reported.'

The third contributor was concerned that the crossunder bitless bridle might damage the sensory and motor nerves of the horse's head. My response was to say that in 15 years I have encountered no such evidence. On anatomical grounds, bearing in mind

the well-distributed and trivial pressure that a strap can apply to cheek or poll, such damage is unlikely. By comparison with the known and serious damage that a bit can do in a horse's mouth, such a concern is unjustified.
