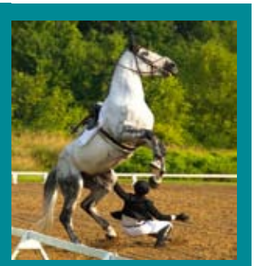
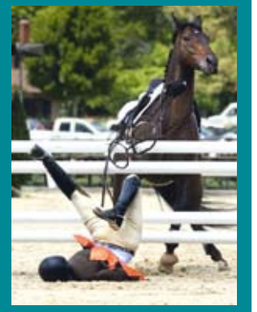




RIDER FALL SAFETY TRAINING

by Lindsay Nylund

Very few horsemen or women have had a 'fall-free' involvement with riding and, while luck can sometimes be a factor in the outcome, riders can reduce their risk of injury by doing fall safety training. There have been some spectacular falls at speed where riders have sustained little injury by using tuck-and-roll skills, while others - from a walk - can have devastating and long-lasting injuries when the rider hits the ground in the wrong way.

With safety a major concern in all sports, and the compulsory use of a helmet to protect the head now across most equestrian sports, it would make sense if learning to fall became a pre-requisite to learning to ride.

Being prepared

It is a part of any training process that mistakes will happen and these mistakes can be used as learning opportunities. A gymnast has the luxury of soft mats and a foam safety pit when learning difficult skills and a trampolinist can learn in a safety belt and with a crashmat.

Equestrian athletes do not have these luxuries and must deal with landing or falling onto far less forgiving surfaces. In the worst case scenario they may also have to deal with a falling horse.

It is not only riders who engage in higher-risk riding activities such as jumping, eventing, racing, polo, polocrosse, campdrafting, trackwork and other competitive equestrian sports, who need to understand that falling from a horse is an inevitable part of the sport. To ignore this fact and avoid doing proper skills-based fall safety training because the training may have some association with failure, makes as much sense as not wearing a helmet because "I don't want to think about getting kicked in the head".

Wearing a helmet is now compulsory in nearly all equestrian competitions, so there is no need to contemplate the risks before deciding whether to put a helmet on—it is just something you do before getting on your horse.

Learning how to reduce the risk of serious injury in a fall should be something that is routinely considered as part and parcel of being a rider. Riders should include in their training regime skills-based fall safety training.

Before engaging in parachuting you need to learn a parachute landing roll; before a gymnast performs a dive roll, they must become competent in a forward roll and other lead-up skills.

In a rotational horse fall or where a horse trips or stops suddenly, a rider may be faced with the prospect of having to perform a dive roll to protect their head and neck. With less than a second to react riders are unlikely to perform this skill without any training, AND it could mean the difference between a few bruises and more serious life-threatening, or at least lifestyle-threatening, disabilities.

Response Time (Reaction Time + Movement Time)

Riders who are falling from their horse have on average ¾ of a second (*between ½ a second and a second or more in some situations*) to carry out some response action. That's not much time if your automatic response doesn't kick in, so having a casual chat to someone about what to do in a fall or doing a google search to read what advice may be out there, is not going to prepare you for such an emergency situation. A rider's ability to respond quickly to protect themselves will depend upon a number of factors such as:

- Whether there has been any warning signal—such as losing a foot from a stirrup, the horse stumbling, a rider in front falling, etc. Riders and horses will sometimes recover themselves, but when the rider is alerted that they are at risk of falling, with training they can respond very quickly if they are unable to recover and a fall becomes inevitable. If there is no warning, response action will take slightly longer.
- **Rider simple reaction time** (SRT) is more of a genetic trait and studies show that average simple reaction time is about 200 milliseconds (ms) or 2/10 of a second. Hitchens et al.

Continued

(2011) found that for jockeys and track-work riders SRT ranged from 192 to 215 ms. SRT is our ability to recognise a stimulus and the brain sending a signal to the muscles to respond. It does not include movement time or the response action.

- **RIDER RESPONSE ACTION**. This is the movement time or muscle actions that need to be carried out. The movement time to get the arms into the Brace Position (described below) with training can be a little as 250 ms or ¼ of a second. It is a learned response action and will vary depending upon the skills-based training that the rider does.

Riders who have developed their fall safety skill can carry out an emergency response action in as little as ½ a second (reaction time + movement time) or slightly longer in an unexpected fall. With an average of ¾ of a second and more time in some falls, it means that riders who have the skills to respond quickly can reduce their risk of serious injury in most situations.

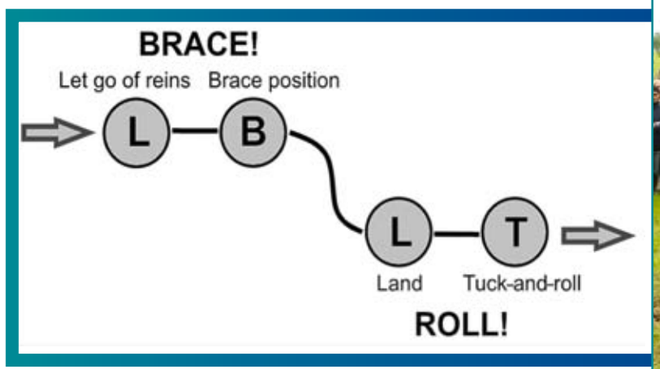
What is good fall technique?

Carrying out emergency response action is a skill, and like any other skill it should be practiced. Having said that, knowing how to respond and understanding the difference between good fall technique and poor technique is valuable. Knowledge can be an important precursor to motivate the rider to undertake proper skills-based training. Having some knowledge of correct response action is also a good thing where riders may have been given some wrong, albeit well-meaning, advice.

With as little as half a second in some fall situations, there is no time to evaluate the details of the fall *(Which way am I falling? What is the horse doing? etc.)* and then choose between different courses of action.

By the time the rider has evaluated the situation and tried to decide between different courses of action, in most cases they would already have impacted with the ground. Therefore the initial emergency response action, once a rider realises that a fall is inevitable, is to let go of the reins and quickly get the arms into the Brace Position. It can be carried out in half a second with some training, and in the vast majority of falls riders have a half a second or more before they make contact with the ground.

The correct response action in a fall is summarised in the following diagram:



Source: SURVIVING THE UNEXPECTED Fall Safety Training for Horse Riders, Nylund (2015)

Let's look at each of these elements L-B-L-T.

Let go of the reins

Hanging onto the reins once a fall becomes inevitable increases the risk of the rider ending up underneath the horse (trample injury) or worse still underneath a horse that is falling. Most falls are a result of an abrupt change in velocity—a change in speed and/or direction.

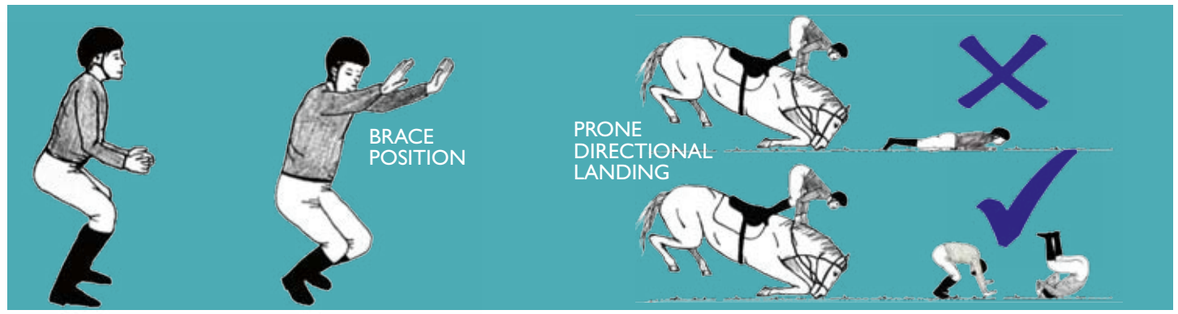
Advice that riders may have received to hang onto the reins when falling because it may be a long walk home, or hanging onto the reins for any other reason is bad advice. Indeed the first Australian Pony Club Council Manual of Instruction advised "Do not try to hold onto the reins. A walk never hurt anyone but a kick does," *(Irving, 1966)*. The following pictures show the increased risk of dangerous consequences where riders hold onto the reins when falling.

Riders who are injured in a fall are in no position to restrain their horse, so number one priority in a fall should be rider injury prevention.

Source: Medical Equestrian Association © Harry McMillan www.peak-photo.co.uk

Brace Position

When letting go of the reins riders should quickly get their arms up into the Brace Position to protect the head and neck. This can be practiced by doing some simple drills (with and without reins) such as the exercises on the following page.



The rider should not try to work out the angle of the fall and then decide what to do with their arms. Getting the arms up into the Brace Position will provide some protection for the head and neck in a face - or head - first fall. It is also the best position to be in if falling at speed (in a flat gallop). At speed, riders will inevitably get rolled or flipped after initial impact with the ground, so even when landing feet-first having the arms in the Brace Position allows the rider to protect the head and neck from subsequent impact and tuck-and-roll after the initial landing.

Another old view that is still prevalent is "Don't put your arms out, you might break them." This is another piece of bad advice. Here's why:

- Notice that in the Brace Position as shown in the above diagram, the hands are turned slightly in and the elbows are slightly flexed. In this position, the impact forces can be absorbed by the muscles of the upper arm and the elbows/ wrists are unlikely to be hyperextended. The risk of a broken arm/wrist is significantly reduced in this position.
- Once the rider has parted company with their horse and is flying through the air the trajectory cannot be altered. Newtons First Law of Motion tells us . . . a body in motion will remain in motion with constant velocity unless acted upon by an external force. In simple terms this means that once a rider has parted company with their horse and is flying through the air, their angle of impact with the ground cannot be altered.
- By pulling the arms in, if the rider is travelling forward to the ground at a bad angle, they risk a direct head/neck impact. The best way of reducing risk of serious injury is to use the arms to protect the head/neck from direct impact with the ground. The above illustration of a prone directional landing shows the danger of not having the arms in the Brace Position at the time of impact with the ground.

Landing

In a normal dismount the rider should land on their feet, and the important thing here is to ensure a good amount of knee bend for impact absorption—to reduce jarring effect when landing on hard surfaces. Recommended knee bend when dismounting is about 90 degrees.

When practicing an emergency dismount the rider should always let go of the reins, land with about 90 degree knee bend and land with the arms in the Brace Position. Emergency dismounts can be practiced using a replica horse or simulation equipment. If practicing on a real horse the rider will need an instructor to restrain the horse to practice the technique. Emergency dismounts should be practiced from both sides of the horse.

Once a fall becomes inevitable, the rider has let go of the reins and the arms are in the Brace Position, the rider should maintain their riding position and not relax their body into a completely open position. It will be easier to tuck-and-roll from a semi-tucked, riding position, after the initial impact with the ground.

Tuck-and-roll

After dealing with the initial impact from landing in any direction, the rider should immediately tuck-and-roll (go hedgehog) and allow the momentum to continue into a roll. Riders should NOT try to alter their direction of travel or stop their momentum, but hold onto the tuck position until they stop completely. At speed this will mean multiple rolls.

In most falls the roll direction is likely to be forward or sideways but in some cases may also be backwards. By allowing the momentum to continue the rider is increasing the stopping distance—so in each successive roll there will be a smaller amount of force acting upon the body rather than a large single impact.

Riders, who have not practiced rolling skills, may be uncomfortable allowing themselves to roll and be tempted to try and stay on their feet or try to stop their momentum by going into a spread-eagle position or lifting their head up to try and keep sight of the ground when being somersaulted. These untrained responses will significantly increase the risk of injury. With some practice, rolling should become more natural after the initial landing. Rolling also reduces the risk of ending up under a falling horse.

Riders should practice a variety of rolling skills until they become second nature. Examples of rolling skills are summarised below and they should be learned under the supervision of a qualified fall safety instructor.

Landing direction	Rolling skill
Feet-first at speed	Feet-first landing followed by forward or sideways shoulder roll
Prone direction	Four-point landing, followed by a forward or shoulder roll
Sideways	Sideways shoulder roll or egg roll
Head-first direction	Dive roll
Backwards	Backward roll

About the Author: Lindsay Nylund

Lindsay Nylund is a former Olympic gymnast and coach of many national champions, with qualifications in fitness, training, physical education and human resource management. He is a world-renowned expert on equestrian fall safety training and published the world-first reference book on this specialised subject matter. The techniques and skills have been developed in consultation with doctors, scientists and industry professionals and refined by training of over 600 riders across many riding disciplines.

Further information about rider fall safety training, instructor professional development programs and analysis of fall incidents can be made via:

Email: horseriderfallsafety@gmail.com
Web: www.horseriderfallsafety.com.au