

# Succeed with SCIENCE!

Riding in the right saddle makes a huge difference to your performance, as our experts from Hartpury College explain



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In last month's 'Science for Success' we discussed riders' natural body shapes and how they affect our ability to ride and perform. This month we turn to an equally important aspect of performance – the saddle, the

interface between horse and rider. Selecting the most suitable and comfortable saddle will enable you to establish a correct and secure position on the flat and when jumping.

Somatotype is the word that describes the shape and ratios of your

natural body. Few people are purely one somatotype, but most of us fall broadly into one of these categories (see last Month's Science for Success for more details), and below we show how saddles can help these different shaped riders and their horses.

## Sitting comfortably?



**Ectomorph** – long, thin muscles/limbs, low fat storage, usually referred to as slim.

In the picture below a slim rider is riding in a dressage saddle. The fit of the saddle accommodates the shape of the rider and supports her weight in a central position, thus allowing her to establish an independent position in the working trot. Whilst this rider is slim and light in her body frame, she is able to ride this bigger horse independently. The saddle provides a balanced seat that she can maintain throughout all of the paces.



**Mesomorph** – medium bones, solid torso, low fat levels, 'V-shaped', muscular.

This rider has just stepped up to affiliated dressage and moved to her first dressage saddle from a GP. After an initial period of adaption, she has achieved much higher percentages. Research has found that through a more vertical position the rider can accommodate the horse's movements through the isometric contraction of the muscles (in particular the abdominals and obliques).



**Endomorph** – increased fat storage, a wide waist and a large bone structure, usually referred to as fat.

This rider has had a saddle made to measure to accommodate her Irish Draught cross mare as well as her body shape. The cantle has well padded panels providing a greater surface area to maximise weight distribution. The saddle fits the rider well, as shown by the the horse's free forward movement and the rider's ability to maintain her own independent position and balance.





## Where should we sit?

Biomechanical research has shown that the seat of the saddle must allow the rider to sit with their seat bones over the horse's fourteenth vertebra. This position places the rider in line with the horse's centre of gravity. If the rider is sitting in this position, then they are likely to be in balance with the horse.

In order for the rider to be in balance (their centre of gravity running in line with the horse's centre of gravity) they must be able to maintain a straight line from their ear, shoulder, hip to heel. The balance of the saddle seat is critical to establishing and maintaining this position.

A balanced saddle will provide equal distribution of the rider's weight through the panels of the saddle, and thus reduce pressure points. Developments in rider performance analysis have highlighted the importance of evaluating the rider's shape, build, anatomical differences and position. All can influence the rider's balance.

*The seat of the saddle should place the rider over the horse's fourteenth vertebra which has an upright spinous process and is generally accepted to be the deepest part of his back*



*If a saddle is the wrong shape or size for the rider, it will affect the the horse's ability to perform*

### Balance is all-important

All equitation theory stresses the importance of positioning the rider in balance with the horse. If the you cannot remain in balance, the continual shift of your body in

front of and behind the movement disturbs your horse's equilibrium.

Every time the rider comes out of balance, the horse makes a compensating adjustment to

maintain their own equilibrium. Such adjustments require the expenditure of much additional effort and energy which affects the horse's performance.



# 5 steps to selecting a saddle

There are several elements to consider when selecting a saddle to optimise horse and rider performance.



**1 Dressage saddle**



**2 Event saddle**



**3 Jumping saddle**

## Sports performance

With modern technology and research it is possible to purchase a saddle to fit any type of rider. These range from the general purpose (GP) saddle (right) which is ideally suited to novice and all-round riders and riding school horses, to special discipline saddles for dressage, jumping, racing, endurance. Finally, there are specifically designed and tailored saddles for the ultimate performance at the elite level of any discipline.



**5 GP saddle**

Saddles from top left: 1 GFS PDS Euro XCH S500 dressage saddle with AMS humane memory foam panel tailored to the horse 2 Albion saddles, like this Kontakt Lite Event saddle can be customised for each rider and horse 3 Amerigo DJ Pinerolo Mono 4 Amerigo Vesuvio jumping saddle for horses with longer withers and straighter backs 5 The GFS Elite XCH for all round riders, with a cut back head and flatter tree for broader horses.



**4 Different seat sizes (top) and flaps can be specified to suit the rider**

## 1 Seat size

This is the first consideration when choosing a saddle: it must be correct for the rider's seat. This means that the seat must be an appropriate width for the rider's buttocks and the length must correspond to the length of the rider from the front to the back of their pubic bone.



## 2 Does it sit evenly on the horse's back?

A saddle sitting high at the front due to a horse with high withers, or the use of a front riser pad, will lift the saddle beyond its correct balance. This will throw the rider back to sit on the buttocks rather than the seat bones, forcing the lower leg too far forward to compensate in a 'chair seat'. This not only puts the rider out of balance but will place the rider's weight on the rear panel too close to the horse's weaker lumbar area.

Conversely, a saddle sitting too high at the back, caused perhaps by excess panelling in the rear section, a horse that is croup high with flat withers or use of a rear riser will encourage the rider adopt a 'fork seat' and to tip forwards with their upper bodies, putting the rider out of balance with the horse. This time it

will force the rider's weight to be focused on the front panels and points of the tree, thus restricting movement of the horse's shoulder.

### Exercise Is your saddle in balance?

A simple exercise to test whether the balance of the saddle is correct for you is to stand up in your stirrups – try it in walk and trot, too. If you are relaxed, not having to fight gravity and can stay standing with your lower leg comfortably underneath you, the balance of the saddle is good. If you have to adjust your legs to stop falling backwards or forwards, the balance of the saddle needs to be addressed.



## 3 Does it support your seat and legs?

Research-driven advances have also been made into designing saddle seats to allow for differences in the shape of the pelvis, hip alignment and flexibility of the rider.

### Gender differences

There are significant anatomical differences between men and women which extend from basic body shape to the way we move.

Women are essentially pear-shaped, have a wider base at the hips and most of the muscle mass is in the legs and pelvis. They have a smaller shoulder complex, as well as less muscle mass and strength in upper body. Because of this women have a slightly lower centre of gravity and a better base of balance.

Men and women also have different-shaped pelvises which cause them to sit slightly differently in the saddle. Men tend to ride with a slightly flattened back, due to the sacrum (the large triangular bone at the base of the spine) being tilted back, causing a flattening of the lumbar spine.

The tilt of the women's sacrum is forward, resulting in an increased curve at the juncture of the lower



Ideal hip alignment



Bow-legged



Knock-kneed

spine which forces the weight on the fork of the seat and creates an arch in the back. An effective, balanced position can be found between the two extremes.

Taking gender into account when selecting a suitable saddle can help ensure a better fit. Some companies have even designed 'female' shaped seats which supports the female seat in its forward rotation.

### How are your hips?

The orientation of the rider's hip bones in the hip socket dictates how the leg will be positioned under the body. Our diagrams show the ideal alignment, medial rotation (bow-legged) which is common in males and lateral rotation (knock-kneed) which is more common in females.

A knock-kneed rider will find it more difficult to apply the leg aids, particularly on a round-barrelled horse. For this type of rider consideration would need to be made to incorporate specific stretching exercises to improve the flexibility of the abductors, hamstrings and quadriceps muscles. Also, the correct saddle seat is important; a narrow twist could help improve the situation.

The angle of the rider's hip is also an important consideration as it affects the quadriceps and muscles of the back of the thigh attached to the knee. Riders with an acute hip angle may suffer knee pain due to stress placed on these muscles as the knee flexes in the riding position, therefore a saddle that allows the hip to stay in a natural, relaxed position can help.



#### 4 Saddle flaps

Once the saddle's seat shape and size has been evaluated, the next focus should be on the shape and size of saddle flap, as it has been found that they also have an impact on the rider's position and balance.

When analysing the saddle flap for a rider, measurements must be made of the thigh and of the lower leg, plus the length of the stirrup. Whether jumping or riding on the flat, it is widely accepted by leading coaches that riders, particularly at the lower levels, ride with a stirrup length that is too long for them and that many of these riders are unable to ride any shorter due to the flap design on their saddle.

This is critical when jumping as the rider needs to maintain a 90° angle in the knee joint. Stirrup length can also influence the security of the lower leg.

*Here the rider has a saddle with a forward-cut flap that accommodates her thigh and enables her to ride at the correct length of stirrup while jumping moderate sized jumps. The more demanding the jumping, the more forward cut the flap needs to be.*



*The saddle blocks should run parallel with your thighs when you're in the correct position*



#### 5 Block shape

The shape of the block is also important when choosing the flap shape. Ideally the block should run parallel with the thigh when the rider is in the correct position for their discipline.

A block that is positioned at too straight an angle will

compromise the rider's position, by pushing the thigh backwards. Unless the rider is extremely flexible through the hip and pelvis it will force their seat towards the back of the saddle or in the case of a deeper seated dressage saddle, force the rider onto a 'fork seat'.

**Albion's Platinum Royale Dressage Saddle, ridden in by Laura Bechtolsheimer, has blocks that support an advanced dressage leg position**

#### Next month

So now you are sitting comfortably, find which equine injuries are most prevalent in different disciplines, and how to prevent them.