

The Path to a Perfect Saddle

Dr. med. Stefan Staudte · Tobias Hild



SQLab.
Ergonomic
laboratories

laboratories
Ergonomic
SQLab.

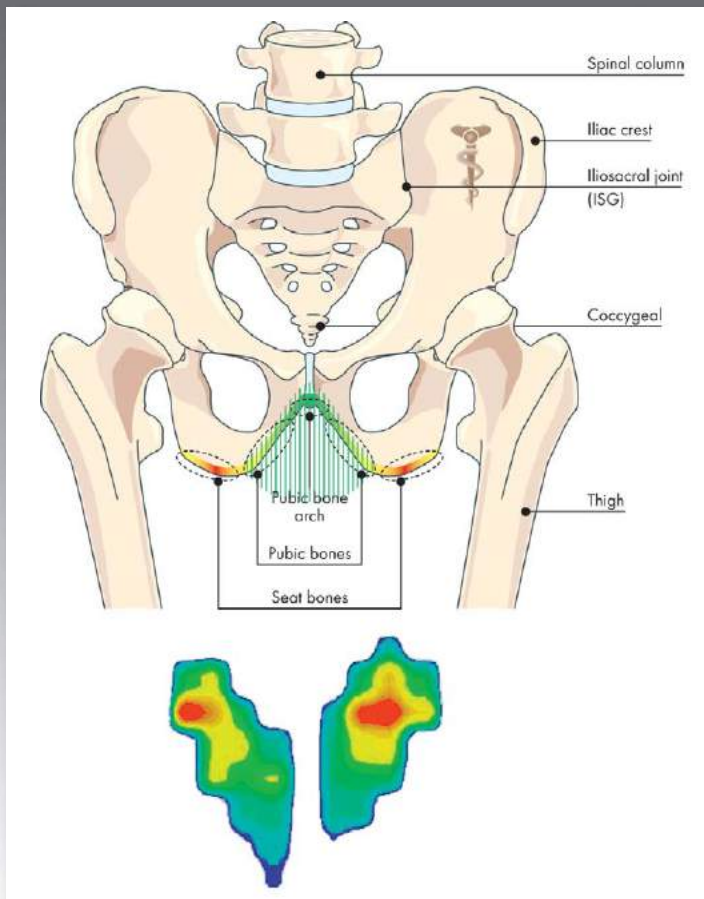
2012

Pelvis

The purpose of the seat bones in a normal sitting position is to accept body weight. This also occurs during cycling. The red areas (see diagram) can withstand heavy pressure.

The perineum (green area) and the pelvic bones are the contact areas for sitting positions during sport activities.

The far reaching network of nerves and blood streams, starting in the perineum, stretch from the anus via the genitalia to the upper pubic bone arch. They stretch beyond the pubic bones on the side. These can easily accept weight. However, a pressure reduction is required. Uniform pressure reduction for the perineum area and the pubic bones is achieved by the lowered saddle nose; a step saddle principle developed by SQlab.



The red areas mark the seat bones, which can take heavy pressure.

The yellow areas should already be relieved: the green area must be free of pressure.

This is a perfect pressure measurement image of a step saddle with the highest pressure leveled at the seat bones, strongly reduced pressure at the pubic bones, almost free of pressure in the middle of the perineum area and the pubic bone arch.

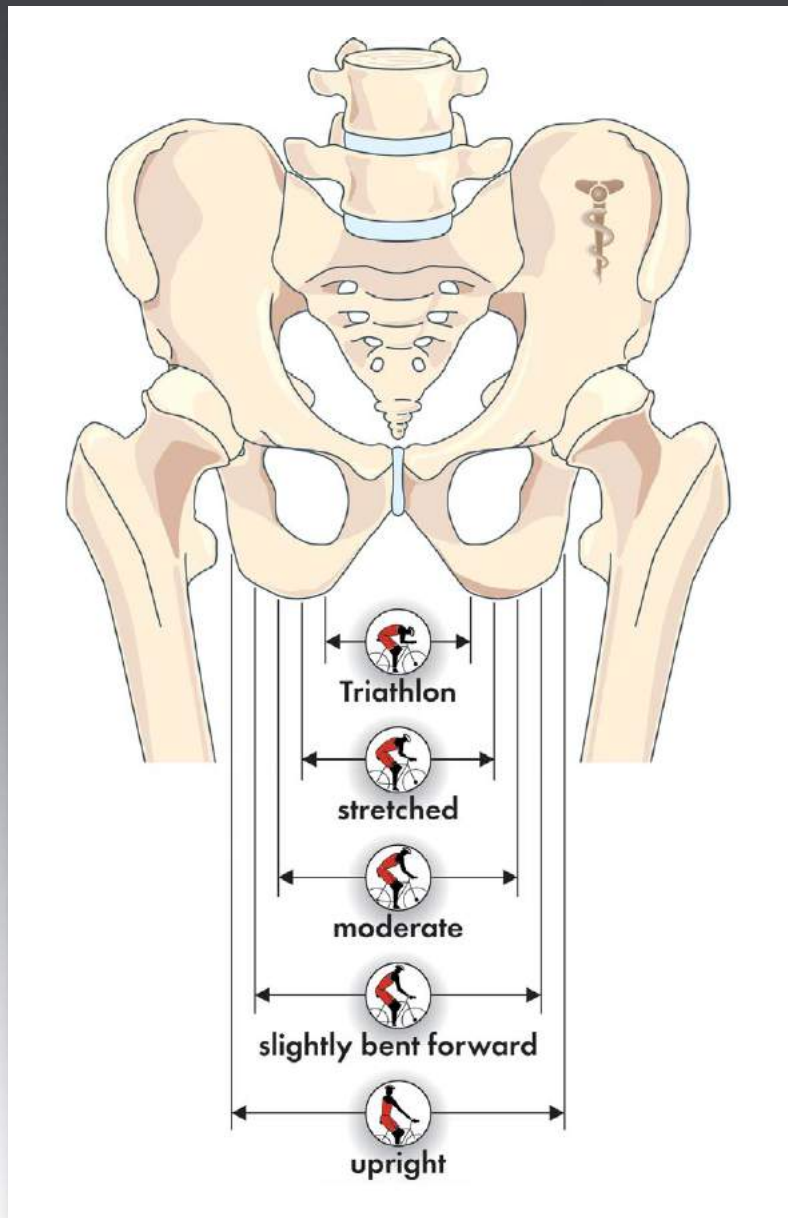
Pressure measurement image

Film with sensors will be placed over the saddle. The resulting pressure will be measured with approximately 100 sensors as soon as the rider sits on the saddle. The measurements can be executed in the laboratory on a trainer or can be executed dynamically during a bike ride with the data sent wirelessly to a PC. The pressure distribution will be displayed in color: blue means little pressure.

The pressure increases from turquoise/green/yellow/orange to red. The pressure measurement image displayed was measured for a male with a weight of 75 kg and body height of 180 cm with an average seat bone distance. The sitting position of app. 30° was between sporting and moderate.

Sitting Position

The contact point moves from the seat bone to the pubic bones when a rider is in the triathlon position. This position requires a narrow saddle. The contact area is critical for very sport sitting positions and should be lessened in the middle and at the pubic bones.



*Saddle contact points
for different sitting positions*

Rule:

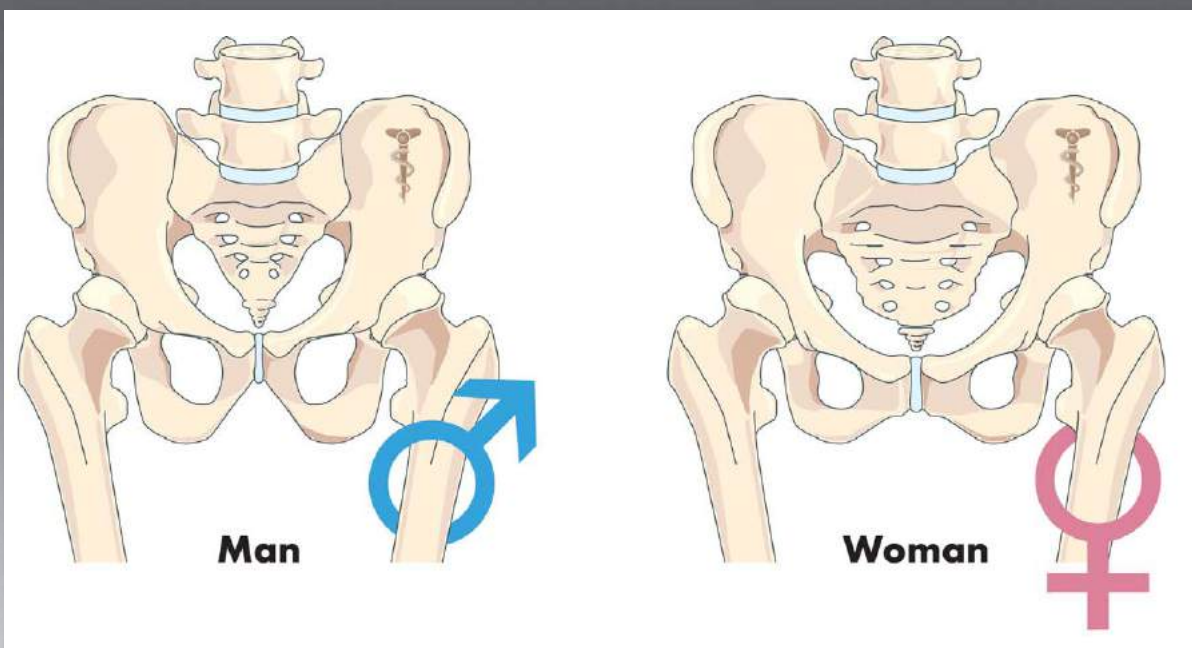
The width of a saddle must increase
when the sitting position becomes more upright.

The Difference between Men and Women

Rule:

The difference between men and women:

- The pubic bone of women is normally lower
- The pelvis of women is on average a little wider



Male pelvis

The female pubic bone, which is in a lower position, can clearly be seen

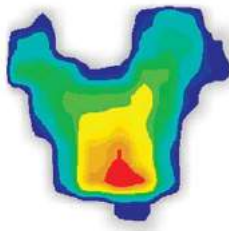
Attention!

Many women have a very small distance between seat bones and many men have a very large distance.

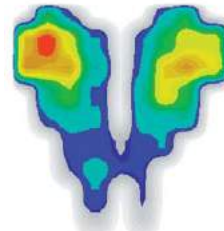
A measurement of the seat bone distance with the help of a measurement cardboard simplifies correct saddle selection and saves unnecessary test rides.

Different saddles for men and women are no longer required with the SQ saddle concept!

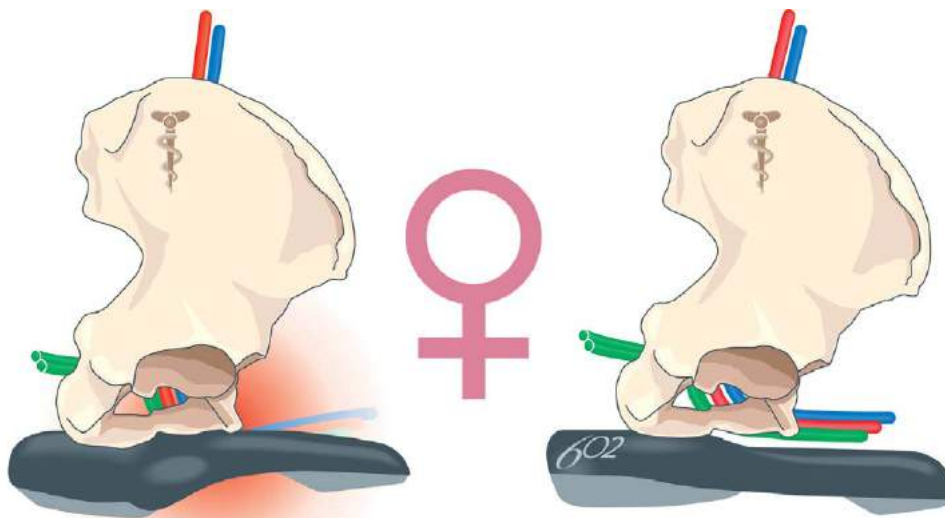
Pressure: Saddle Nose



Typical pressure measurement image of a woman in a sportive seat position on a straight classical race saddle with clear pressure peak at pubic bone arch/saddle nose.



Pressure measurement image of an average built woman in a sportive position on the SQlab 612 - without pressure points at the saddle nose.



Conventional saddle with a pressure point: saddle nose/pubic bone

Step saddle with pressure relief perfectly adjusted to the female anatomy saddle nose/pubic bone

Pressure point saddle nose

Cause:

The problem can often be seen in woman!
The female pubic bone, which is in a lower position pushes on the saddle nose.

1. Solution:

The SQ step saddle with lowered saddle nose evenly reduces the pressure.

2. Solution:

A more upright sitting position elevates the pubic bone.

3. Solution:

(Some competitive saddles – not good)
Saddle slopped forward and downward; rider slides forward into the small settlement area.

Important: Review the saddle width!

Dynamic Sitting – SQlab MaxContact

Occurs when cycling riders constantly change positions on the saddle. A little change of the upper body posture, a slight change in angle of the pelvis, will change the contact points and alter weight distribution.



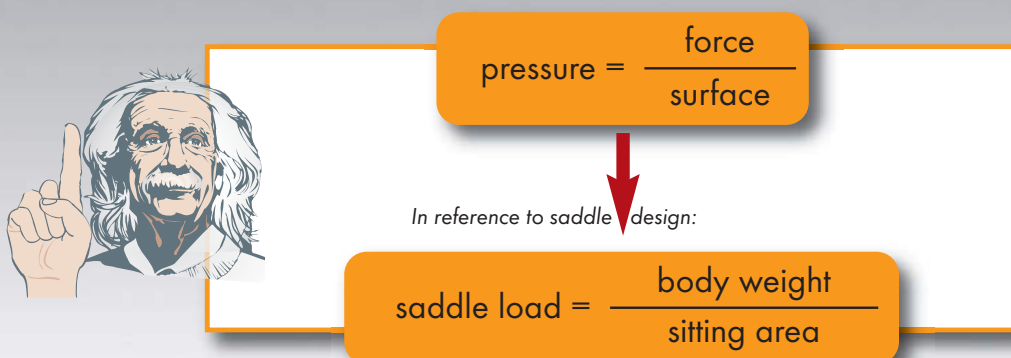
A city commuter may prefer an upright position for better visibility or a more sporting position in adverse weather conditions.



A good mountain bike rider has an active riding style. He or she will alter their body position according to the terrain. Their center of gravity moves forwards and backwards depending on whether ascending or descending. More safety and comfort with dynamic sitting.

More safety and comfort with dynamic sitting

The physical law for the calculation of pressure reads:

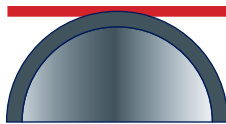


In order to reduce the pressure caused by saddles to sensitive areas, one can either reduce the amount of weight pressing down on these parts or distribute the weight over a larger surface area.

SQlab's MaxContact technology, combined with their step saddle design, does both.

The step saddle design takes much of the weight off the soft tissue and transmits it to the seat bones. SQlab's MaxContact technology, with an optimal saddle nose design gives a maximum contact area while not inhibiting pedaling efficiency.

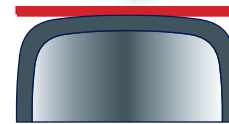
Comparison of Saddle Pressure



Classic race saddle

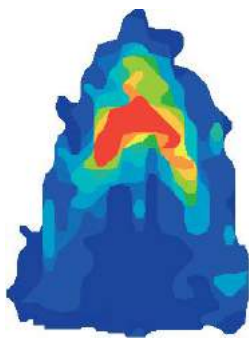


Saddle with cut-out

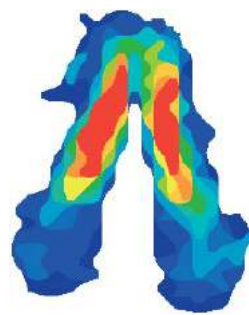


**SQlab 610
with MaxContact®**

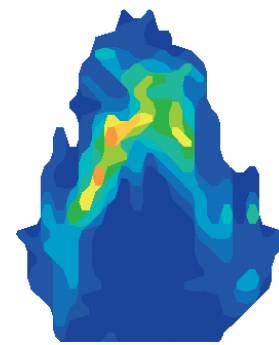
Saddle pressure measurements for a mountain bike rider in a sport riding position who is sitting forward on the saddle (as when climbing).



The strongly curved saddle nose offers good freedom of movement for pedaling but the small weight bearing surface increases pressure on the perineum.

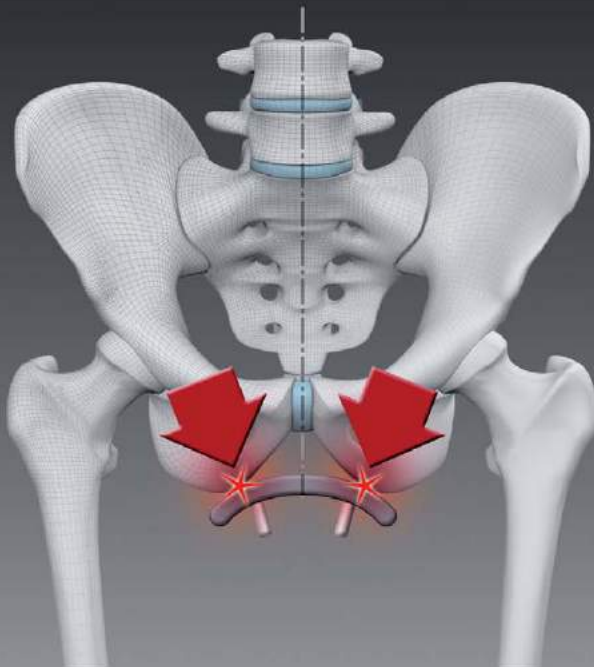


The forward sitting position exacerbates the disadvantages of this type of construction; typically putting increased pressure on the area around the opening.

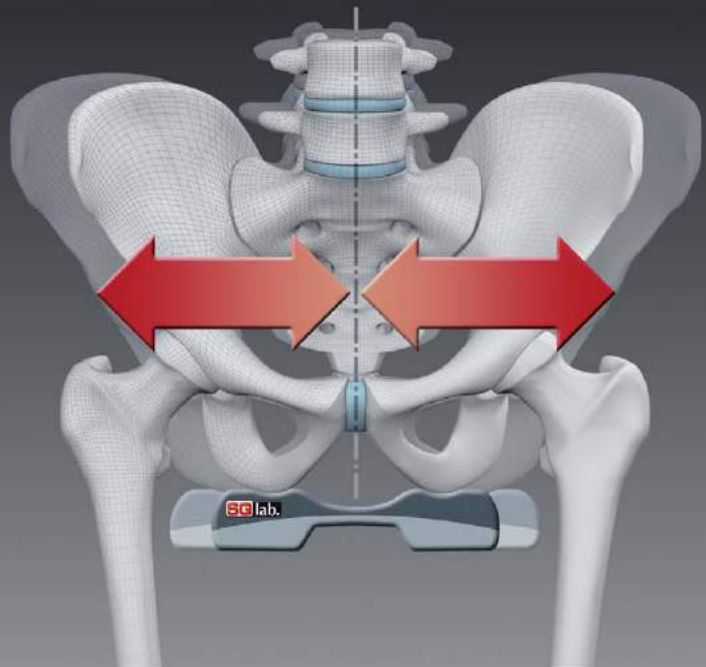


The positive effects of the step saddle design when a cyclist is riding uphill are lessened as he is in the forward sitting position. However, the flat nose of the SQ saddle provides a maximum contact area, greater than do competitive saddles thus, serving to reduce pressure on soft tissue areas to acceptable levels.

Instructions for the Determination of the Optimal Saddle Width



Saddle too narrow



Optimal saddle width



Measurement method for seat bone distance

The following is required:

- Measurement card board
- Marker
- Chair without padding with a level seat area (this area should be as hard as possible)
- Ruler or gauge





Formula:

Seat bone distance – from center to center



+0

Triathlon



+1

stretched



+2

moderate



+3

slightly bent
forward



+4

upright

Important:

The calculated dimension is always the minimum width.

When in doubt, select a saddle that is a little wider!

It is also important, to prevent the selection of a saddle that is too narrow.

A slightly wider saddle can in some cases (trekking/city) be more comfortable due to the larger contact area.

This is how it works:

1. Put the measurement cardboard (flat side down) on a chair and sit on it.
2. Arch your back and possibly go on your toes to push the seat bones further out.
3. Pull yourself down onto the seat area with your hands to increase the pressure on to the measurement cardboard.
4. Get up. The seat bones have imaged themselves on the waves of the cardboard. The impressions can be clearly marked with the marker. Mark the center point.



After obtaining seat bone distance add 0 cm to 4 cm according to riding position.

Cyclists who ride only up to 30 min. need soft saddles 621 soft or 603.

For longer rides we recommend all other SQlab saddles. To keep the familiarization of the seat bones ride at least every two weeks.

For sensitive sit bones we recommend the active series.

Seat bone prints with different sizes, left and right, indicate pelvic malposition. In these cases the active series is the clear solution.



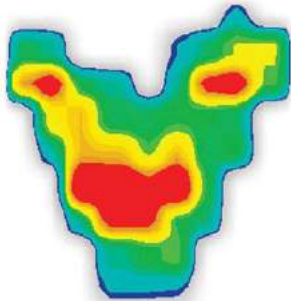
Medical Explanation – Numbness

Numbness occurs as nerves are compressed and/or are receiving reduced blood flow in the perineum area. The corresponding body part cannot be felt correctly and is perceived as numb.

Attention! Special nerve fibers and vessels in the perineum area of the male are responsible for erection of the penis. A reduction of sexual performance can be a result of these parts, repeatedly and for long periods, receiving low blood flow or being often compressed.

This process is reversible. After a long rest familiar sexual performance reappears.

Attention! The problem can become chronic. Numbness is a sign for concern! Listen to your body. The positives of proper bicycle training outweigh the negatives.



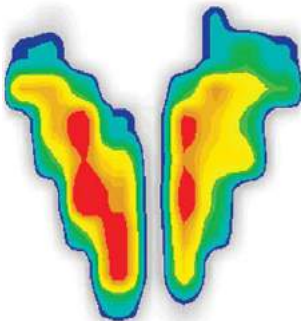
Typical pressure measurement image of an arched classical saddle

with very heavy pressure at the perineum area.

The blood supply is significantly reduced.

Attention! These saddles are probably being viewed as comparable during a test ride.

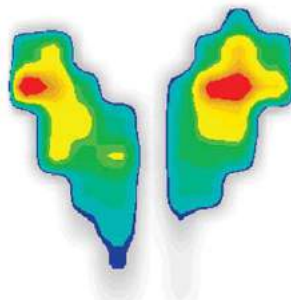
The seat bones react to pressure with pain, while the perineum area does not react very much!



Typical pressure measurement image of a saddle with a hole

with dangerous pressure peaks at the sides of the perineum area, in important arteries and in nerve tracts.

The blood flows well in the middle, however, numbness is experienced.



Typical pressure measurement image of a SQuab step saddle

with clear pressure points at the seat bones and pressure relief in the lowered frontal area.

The depression in the middle of the saddle guarantees an outstanding blood and nerve supply.

Urologists recommend SQuab step saddles.

Numbness

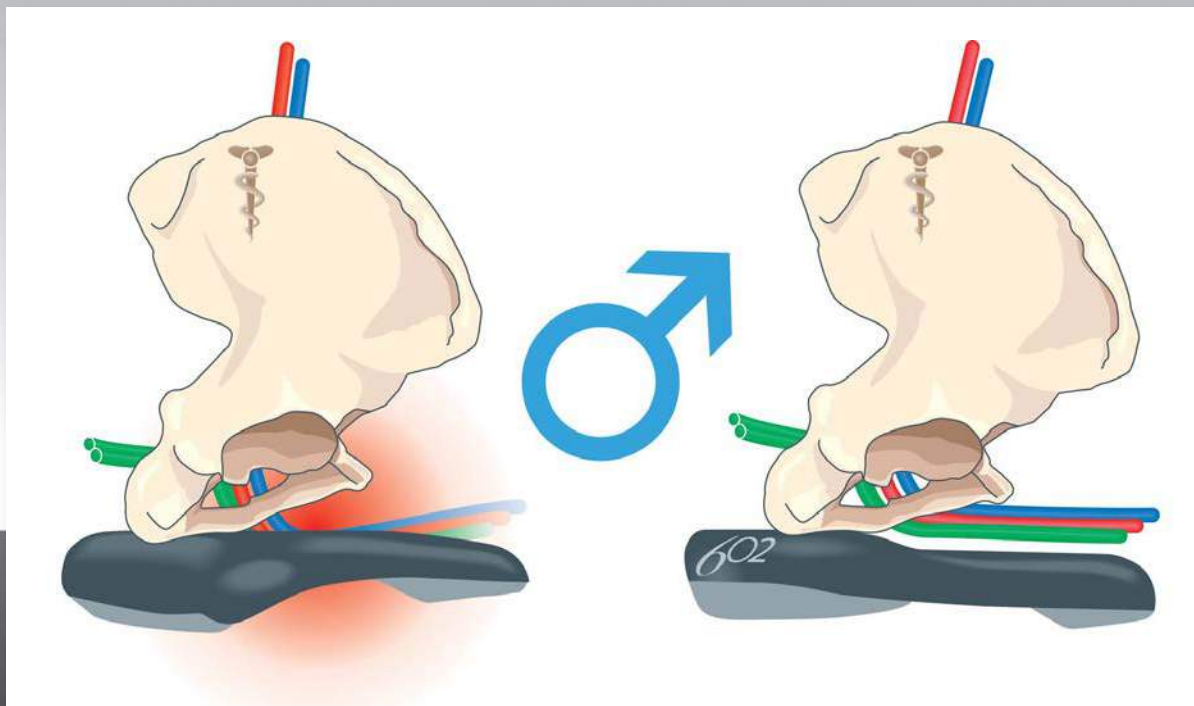
Solution: Measure seat bones to prevent selection of a saddle that is too narrow.

The SQLab step saddle concept distributes body weight in accordance with medical advice.

The seat bones accept the majority of the body weight on a maximized area. The pressure points on the perineum area and pubic bones are evenly relieved.

General tips for numbness:

- Select a more upright sitting position
- Ride standing up
- Do not ride with a heavy backpack
- Increased pedal pressure relieves the pressure on the saddle
- Reduced body weight reduces pressure on the saddle
- Use thinner seat padding
- Sit as far back as possible at the widest area of the saddle
- Slope the saddle a little forward/downward
- Optimize geometry (SQLab recommends body scanning CRM)



Conventional saddle with heavy pressure to the perineum area

Step saddle with pressure in accordance with medical advice

Painful Seat Bones

1st Cause:

Lack of acclimatization

Solution:

Ride frequently
at least once a week or
every other week.

Alternative: soft saddle
(Attention! Only recommended
for short distances)

2nd Cause:

Saddle is too soft and riding time
is often longer than 30 minutes.

Solution:

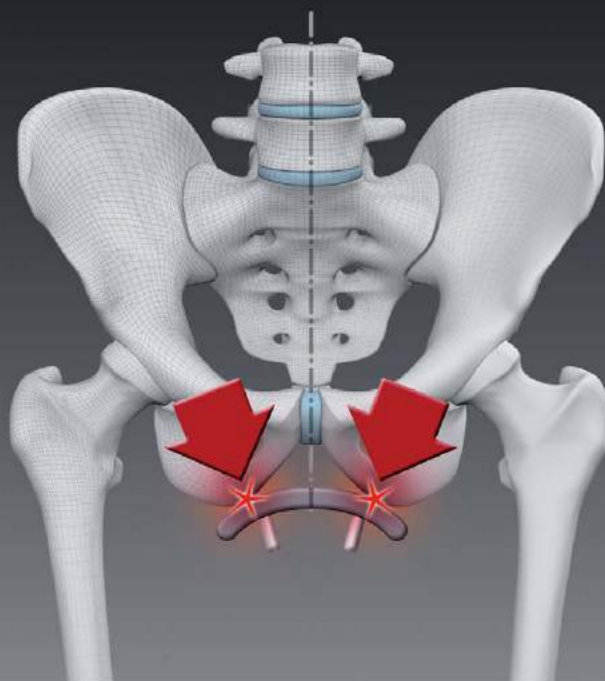
Harder saddle

3rd Cause:

Saddle form does not match the anatomy.

Solution:

Test other form;
arched saddles often create the feeling
of a wedge spreading body parts – in
addition pressure develops in the sensitive
perineum area (see image)



*Saddle too narrow, classic saddle
with strongly arched form*

Rule:

$$\text{pressure} = \frac{\text{force}}{\text{surface}}$$

Pressure = value that generates pain, should be as light as possible

Force = existing value generated by body weight and gravity

Surface = usable contact area of the saddle and the rider

Note:

Pressure decreases with increased surface.

This physics law gives an advantage to the SQLab step saddle concept:
The surface must not be reduced with holes and cut-outs. This is counter productive,
and may have been utilized for economic reasons.

Saddle too Soft

A soft saddle often becomes uncomfortable after app. 30–45 minutes riding time.

The seat bones sink very deep and can aggravate sensitive tissue of muscles and tendons. Pain, described as dull and pressing, starts after approximately 30–45 minutes.

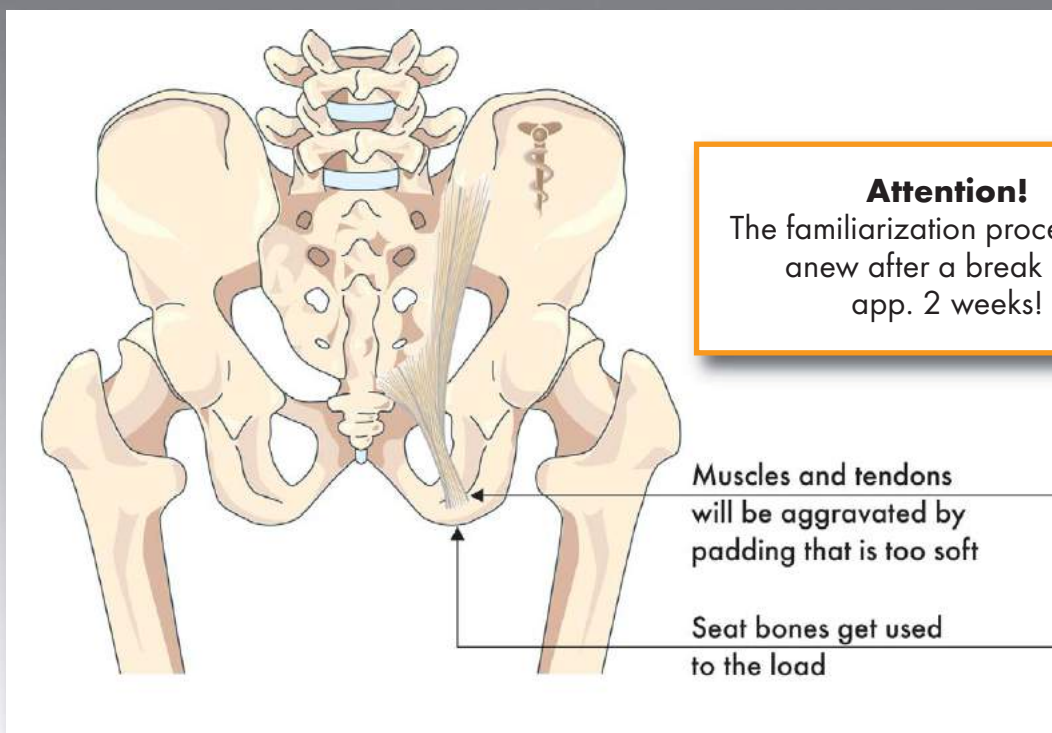
The padding may be so soft that the hard bowl creates the pain.

Familiarization of the Seat Bones

Pain at the seat bones is normal at the beginning of the season or when a new saddle form is used. Familiarization with a new saddle can take app. 5 to 6 rides.

At least two days of rest should be scheduled between the initial rides to give the already sensitive muscles and tendons time to react.

SQlab lists the hardness and the padding material on the saddle. To that extent, we developed a measurement unit, SQ Shore, which includes a combination of cover and padding materials.



Pelvis from the back

Rule:

Soft saddles are suitable normally for short distances!

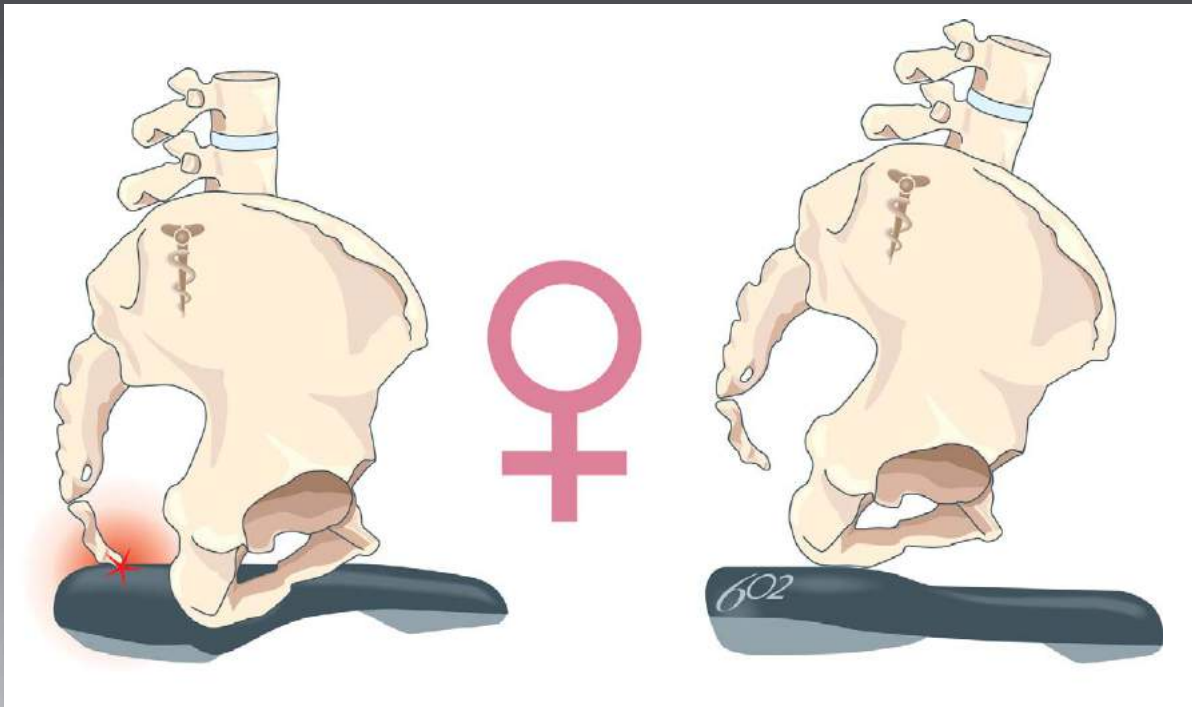
Rule:

A new saddle form is in most cases uncomfortable after a single test ride.

Pressure on the Tailbone

Cause: This problem is mainly seen in women, as the female tailbone is usually more flexible and very often more sensitive than the male tailbone.

The tailbone gets very close to the saddle in upright sitting positions.
The addition of a soft or narrow saddle can generate ailments.



Saddle too narrow or too soft

Step saddle with suitable saddle width and stiff padding

Rule:

Female tailbones are often more flexible
(helps during the birth process).

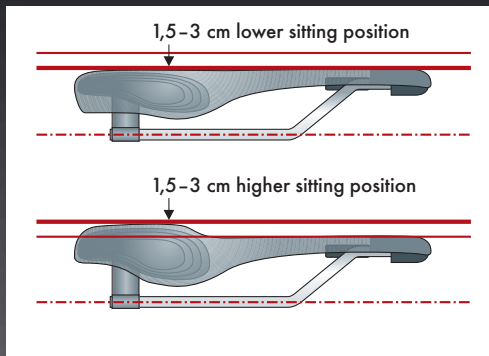
This is likely the reason women more than men have problems
with their tailbones.

Skin problems

Cause: In addition to lack of hygienic care, the skin can be aggravated due to forces created by seams and embroideries as well as by pressure. Ingrown skin hair can cause inflammations.

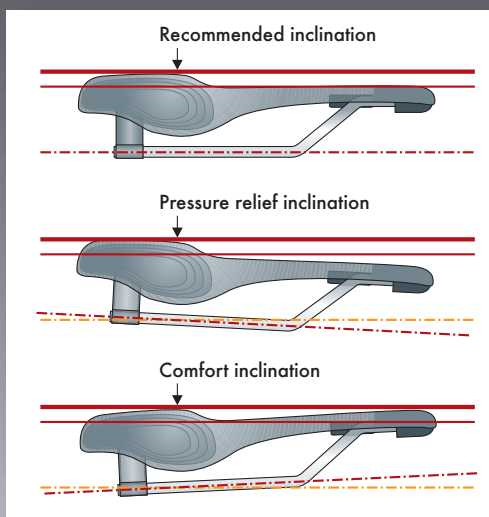
Pants can generate folds, which in turn can grind the skin when saddles with holes or cut-outs are used.

Adjustment Advice for SQLab Saddles



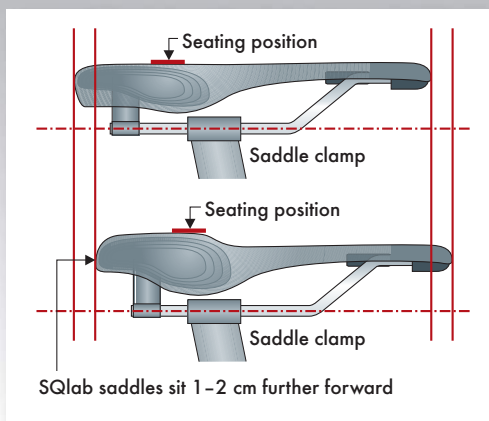
Saddle height:

Please note, that the SQLab saddles are approximately 1.5 to 3 cm higher due to the elevated seating area. For test rides, seat post height may need to be adjusted accordingly.



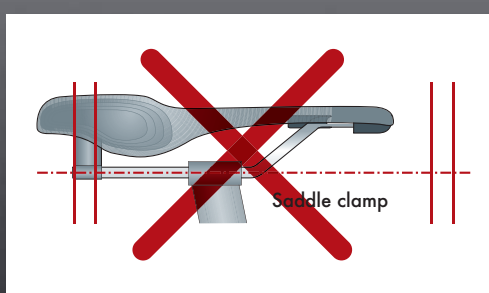
Saddle slope:

Begin by positioning the saddle nose horizontally or pointing slightly upward. The nose can be sloped slightly downward to lessen pressure on the perineum area. The nose slightly upwards for increased comfort.



Saddle shift:

SQLab saddles should be 1 to 2 cm more forward than conventional saddles. It is important that the seat bones fit on the wide seat area.



Saddle clamp:

The saddle should never be pushed completely back in the saddle clamp as increased leverage can damage the saddle rails.

Please observe the specified torque settings provided by the seat-post manufacturer. In addition, the clamping area should be at least 35 mm long.



RACE



Road and MTB saddles come with a lowered saddle nose and more space for your sensitive areas.
A perfectly elevated sitting area supports the seat bones and two thin layers of gel provide additional cushioning.

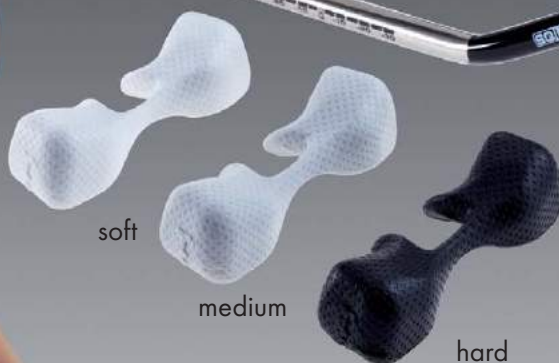


Hanka Kupfernagel

8 x world champion
3 x European Champion
33 x German Master Winner
since 2005 on SQLab

611 active **SQLab.**

RACE



A delight to the spine

The saddle's dampened lateral tilt allows it to follow the biomechanical movement of the pelvis on each pedal stroke. The result is a decrease of pressure on the seat bones and a mobilization of the spinal discs.

The lowered saddle nose of SQLab's step saddle design was developed by SQLab's head of R&D, Dr. Stefan Staudte (Urologist & extreme biker) to distribute bodyweight.

For MTB + Road – adjusts according to body weight.





A delight to the spine

The saddle's dampened lateral tilt allows it to follow the biomechanical movement of the pelvis on each pedal stroke. The result is a decrease of pressure on the seat bones and a mobilization of the spinal discs.

The lowered saddle nose of SQlab's step saddle design was developed by SQlab's head of R&D, Dr. Stefan Staudte (Urologist & extreme biker) to distribute bodyweight.

For Trekking - adjusts according to body weight.



To have a softer and more comfortable saddle tilt, pull two sticks out of the damper as shown.

Without sticks the damper is softer, and sideways movement is increased.

We recommend riding with the sticks when bodyweight is 80 kg or more.

After a break in period the saddle becomes softer.

Keep the sticks in case if you need them for a more firm damping.



To Remove Sticks:

- 1 Push the first stick with the round side of a marker or allen key so it is a little bit out of the damper.
- 2 Pull the stick out by hand.
- 3 Push the second stick and pull it out.



Comfort and strength via extended level space

More level space means less pressure and that brings comfort. Therefore, the level space of the 602 active is longer to the seating area and becomes a little less round to make the sitting space 20 % larger.

With a narrow saddle nose and increased sitting space, 20 % less pressure is felt and therefore comfort results and strength is gained.



610
SQ lab. Gel

FITNESS



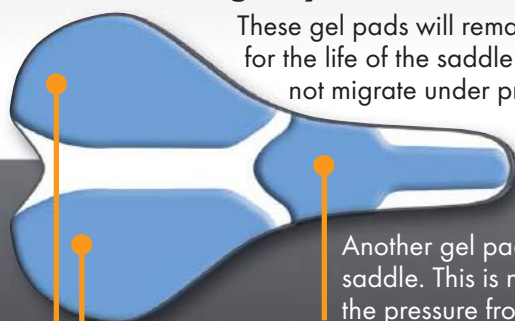
Based on the 611 carbon fiber bonded saddle, the new 610 is aimed at the comfort orientated MTB rider, who also rides long distances. The 610 is perfect for high quality trekking bikes.

In addition with its microfiber surface and the long distance compatibility pad the 610 is perfect for bike holidays.



3 chamber gel system

These gel pads will remain effective for the life of the saddle and will not migrate under pressure.



Another gel pad sits on top of the saddle. This is nose shaped to align the pressure from the pubic arch.

Gel pads are positioned under the seat bones. Their thickness varies across the pad to align with the forces exerted by pressure from the seat bones.

610 **active** **SQLab.**

FITNESS



TIPP
aktiv Radfahren
Empfehlung
Testsieger
6/2011



A delight to the spine

The same technology as the 611 active; the shape of the 610 active fits perfectly for more upright and moderate riding positions. As do all SQLab saddles, the 610 active comes with a lowered saddle nose.

The saddle's dampened lateral tilt allows it to follow the biomechanical movement of the pelvis on each pedal stroke. This results in a decrease of pressure on the seat bones and a mobilization of the spinal discs.





Those using a bicycle daily for transportation to and from work, deserve a comfortable ride. Therefore, a saddle with exceptional firm foam is a must. Feeling good at work brings greater productivity, and then resting at home becomes more refreshing.

The perfect summer saddle if perspiration is making you uncomfortable. The lattice saddle structure provides maximum airflow and the open pores in the saddle cover aid ventilation and ensure you never lose your cool.

Air



Soft

Softer padding, in combination with a gel top layer, moulds itself to the seat bones and make it the first choice for occasional cyclists. Its totally enclosed steel springs are also more softly sprung than the 621 Nano and Airflow saddles. It is no wonder this saddle has been dubbed "the comfort miracle".



A delight to the spine

The saddle's dampened lateral tilt allows it to follow the biomechanical movement of the pelvis on each pedal stroke. This results in a decrease of pressure on the seat bones and a mobilization of the spinal discs.

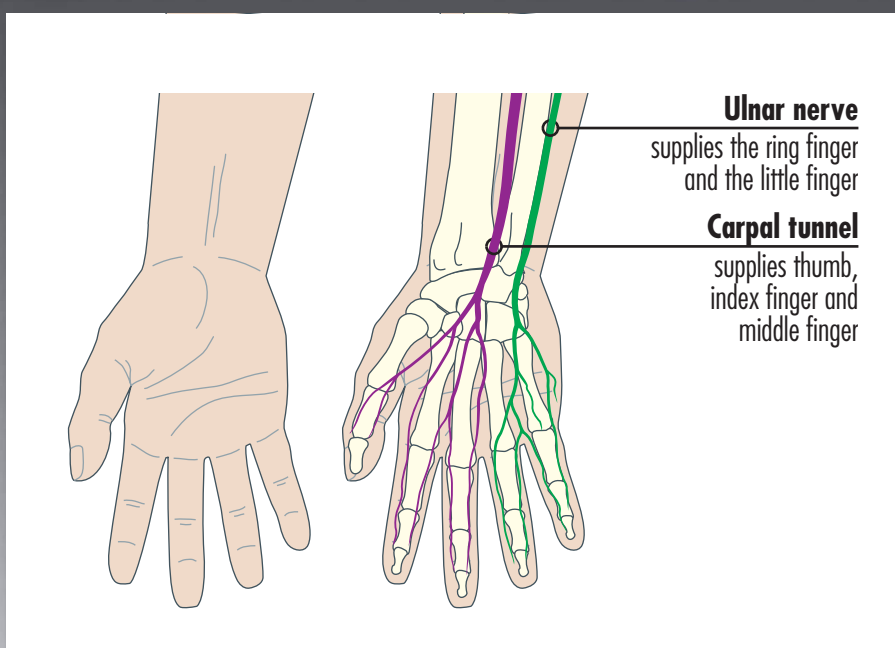
The lowered saddle nose of SQLab's step saddle design was developed by SQLab's head of R&D Dr. Stefan Staudte (Urologist & extreme biker) to distribute bodyweight.

For Hybrid and Comfort bikes – also for stationary bikes.





GRIP & FIT



Ergonomics that fit!

Holding, steering and braking are the most important tasks a grip must facilitate with comfort.

Only a grip that fits the hand perfectly can fulfill this task.

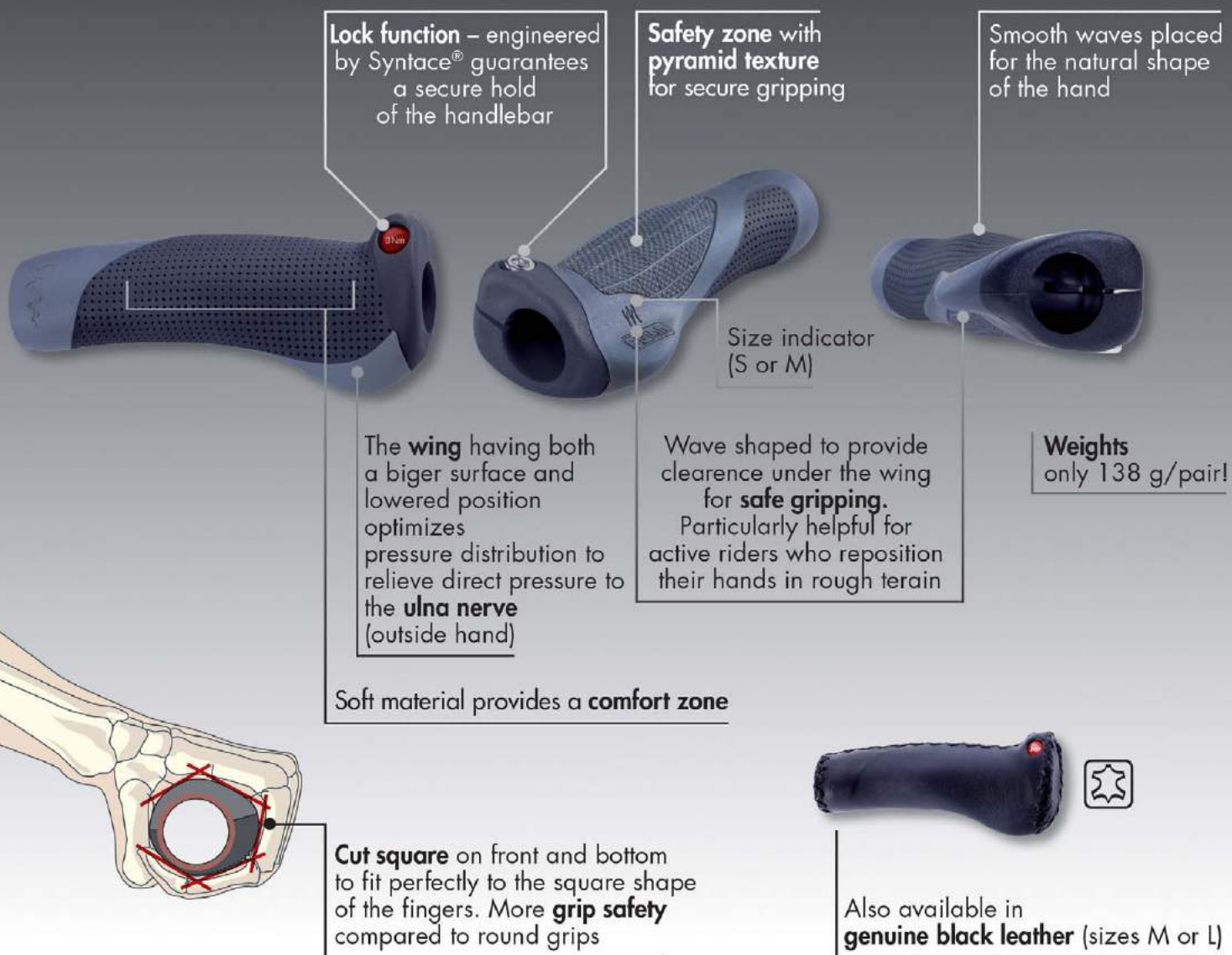
During pressure measurements at the contact point between the inside hand surface and the handlebar grip, pressure at the outside is highest.

This is exactly the point where the ulna nerve is positioned. This nerve is responsible for sensitivity of the ring and little fingers.

SQlab increased the contact area at this point and, in so doing, reduced the pressure.



GRIP SAFETY



The grip that fits

The size of the wing is constructed to reduce pressure on the ulna nerve while allowing maximum control of the bike. Notice the front and bottom of the grip are square cut and fit the fingers perfectly. The locking system is light weight and engineered in Germany.

SQ BARS

315

SQlab.

Cross Country

630 mm · Rise -15 mm · Ø 31,8 mm
Backsweep 15° · Downsweep -10°



316

SQlab.

All Mountain

680 mm · Rise 72 mm · Ø 31,8 mm
Backsweep 16° · Upsweep +15°



316

SQlab.

Trekking

630 mm · Rise 0 mm · Ø 31,8 mm
Backsweep 35° · Downsweep -10°



Hand-Elbow-Shoulder-Back

These are a chain link of body parts. The position of each at a given time causes changes to the position of the others. For example, the angle of the hand leads to a position of the elbow, and influences the problem zones of the shoulder which impacts the force applied to the back. Our handlebars are not made for a bike category. They are made to give the rider a comfortable natural position and dynamic biomedical movement.



SQLab Grip Size Template

1. Put your hand on the image and position the middle finger at the arrow.
2. Stretch the thumb to the side.
3. Mark the bend of the thumb as shown in the image.
4. Read the size and select the grip.



SQLab GmbH

Postweg 4 · D – 82024 Taufkirchen
Germany

Tel: +49-(0)89-6661046-0

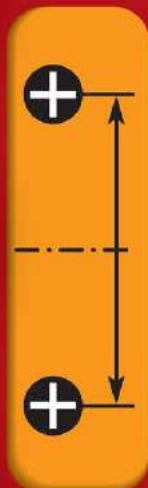
Fax: +49-(0)89-6661046-18

info@sq-lab.com · www.sq-lab.com

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20



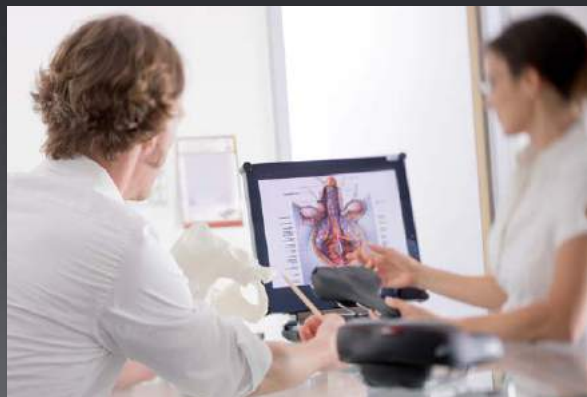
sq lab.
Ergonomic
laboratories



! City + Comfort !



Perfect Ergonomic Products that fit!



SQlab utilizes the highest scientific levels for the development of ergonomic bike products.

At SQlabs, under the head of Dr. Stefan Staudte (Urologist and Extreimbiker), R&D groundbreaking efforts originated products and concepts such as the stepsaddle, the saddle fit system and the brand new active technology.

Every bicycle rider is different – and therefore our saddles, grips, bars and insoles are all available in different sizes and shapes.

Our products are available at IBDs. Our dealer sales staff have special knowledge and lots of experience in bike ergonomics and are able to measure your sit bones, check your grip size and foot type.

To ride comfortably, efficiently and pain free, the saddle, handlebar, grips, and in fact, the whole bike, must fit like a good pair of shoes.



sq lab.
Ergonomic
laboratories

SQlab GmbH

Postweg 4 · D - 82024 Taufkirchen · Germany
Tel: +49-(0)89-666 10 46-0 · Fax: +49-(0)89-666 10 46-18
info@sq-lab.com · www.sq-lab.com