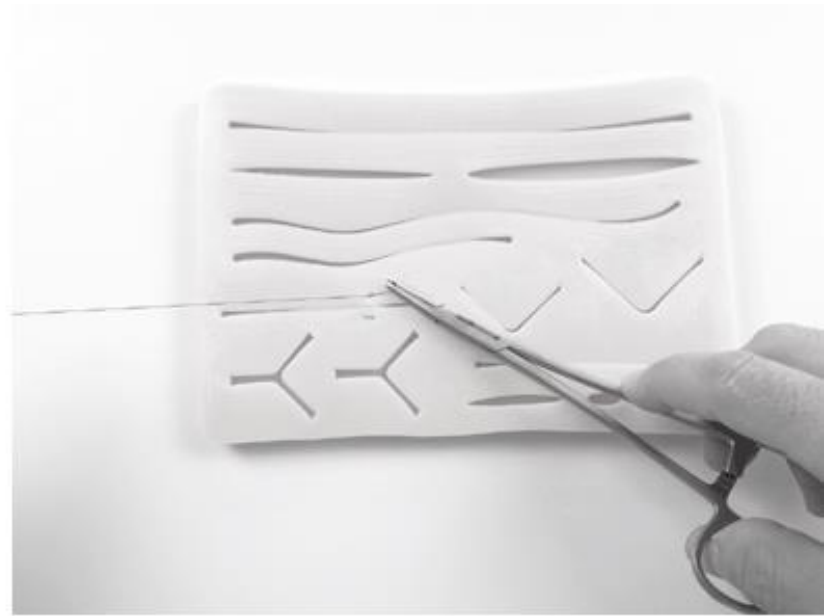
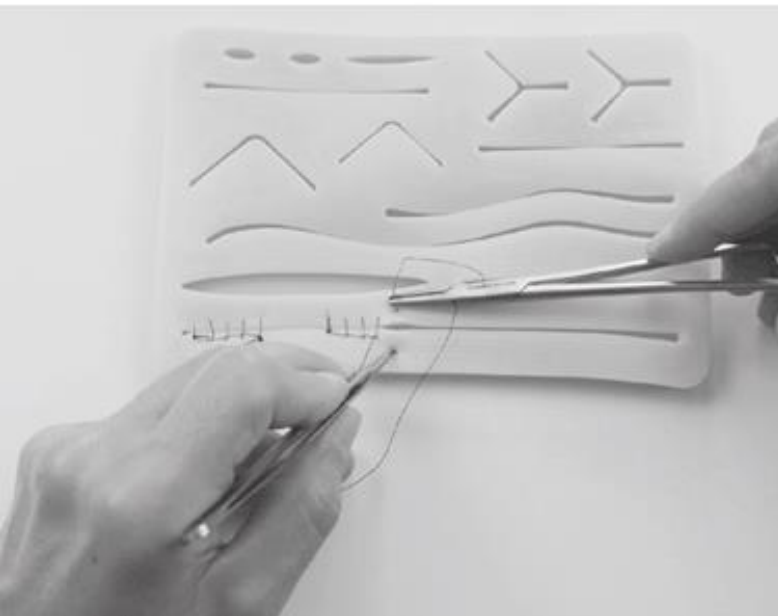


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Basic Suturing Skills

Course manual

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Introduction

This manual has been written to accompany our SurgerySkills.com 'Basic Suturing Skills' video course, and when used with the video aims to help build, develop and advance your suturing skills.

There will be a number of course elements found only in this manual whilst others will only be in the video, so please ensure you use them together (**if you haven't already got our video, go to [Surgeryskills.com](https://www.surgeryskills.com) for details**).

We assume no knowledge of suturing to begin with and will guide you step-by-step through a number of suturing techniques, building confidence and a lifelong skillset.

- **Learn:** about the instruments, common suture techniques and handy tips & tricks.
- **Develop:** valuable techniques quickly and effectively with our step-by-step approach.
- **Excel:** in your class or work by showing the skills you have gained.

Course objectives

In completing this course, we aim for you to:

- **Gain new suturing skills**
- **Develop confidence and knowledge**
- **Master the common skin suturing techniques**
- **Build the foundations for advanced stages**

By learning in your own time and at your own pace, without any pressure, we hope you will enjoy our course whilst developing a range of techniques to help enhance the care you give throughout life.

About your course instructor

Mr Hamid Tehrani is a Consultant Plastic & Reconstructive surgeon from the UK, with a specialist interest in Mohs surgery. He has taught hundreds of trainees and on numerous courses including those of the Royal College of Surgeons. As well as over 20 years surgical experience, positions held include:

- Chairman/Training lead of the UK Mohs surgery Training Interface Group, under Health Education England.
- Member of the Faculty of Surgical Trainers, Royal College of Surgeons.
- Chairman of the British Plastic Surgery Mohs special interest group.

He was the first Mohs-trained Plastic surgeon in the UK, and set up the UK's first Plastic surgery-led Mohs service which has since won numerous awards and commendations for the care given to patients.

Mr Tehrani is passionate about teaching, giving invited lectures to numerous surgical and medical specialties and training surgeons from across the world.



You will note throughout our course that we haven't used expensive models to demonstrate techniques – whilst you can of course buy these if you wish, we realise that many students may have financial restrictions so have used models that are as simple and cost-effective as possible and can be easily reproduced at home. We hope this helps!

Whilst this course provides certain techniques and opinions, they should not be taken as 'the best' or 'only' ways, and there are many other valid techniques that may be used. You may be given advice contrary to the contents of this course or adapt your techniques in time to differ to those described, but we hope the course will at least provide the foundations for doing so.

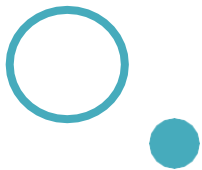
Completing this course does not imply competence to perform the techniques in live cases and you should always be overseen by a competent person when first doing so.

If you haven't already got our video, go to [Surgeryskills.com](https://www.surgeryskills.com) for more details

Basic Instruments

Suturing does not require a vast selection of instruments, the main ones being needle holders, toothed forceps and scissors.

- **The needle holders** are, as their name suggests, used to hold the needle when suturing. Also called needle drivers, they have a ratchet system to allow them to lock in place when wanted. Some people prefer to hold them with the 'palm technique', but most use the classical technique of placing the thumb and ring finger in the rings of the holder, whilst using the index finger to stabilize. As explained in the video, the idea is to use only the pulps of the thumb and ring finger, to allow for greater manoeuvrability of the holders.

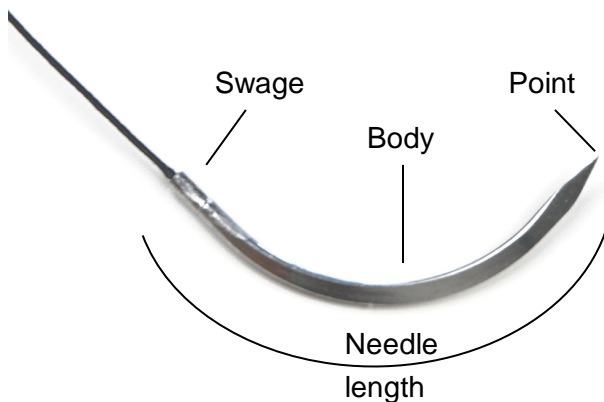


- **Toothed forceps** are used to grasp tissue and stabilize it whilst suturing. The teeth are fairly fine points though, so even a small force can exert a large pressure at the teeth tips. Care should therefore be taken to not crush the tissue by squeezing too hard with the forceps. The holding position is the 'pen grip'.



- **Scissors** are held in a similar grip to the needle holders. If you are left handed, they can take some practice to master; rather than 'pushing' with your thumb as you cut, left handed use requires the thumb to 'pull inwards' as you cut. Even if you're right handed then you should still practice using your left hand as you may one day not have your right hand free (eg holding a retractor) when you need to cut a suture.

- **Sutures** (known commonly as ‘stitches’) have a needle attached to a thread. The diameter (and so tensile strength) of the thread is written as either a single number or as “-0”. Very robust threads are in the 1,2,3 or more range and in this instance a size 3 is not as thick as a 5. When the threads drop below size 1, they are written as “-0”. Then the higher number means a finer thread - so a 7-0 thread is finer than a 5-0. In skin surgery 3-0, 4-0, and 5-0 are commonly used. Threads such as 11-0 are very fine and used in microsurgery.



- **The needle** can be described in various ways, including the type of point, body shape, length and curvature. The former two are outside this course scope;
- the **length** is in mm, and common skin sutures are 19mm or 26mm. You would pick the size according to the need, for example a 26mm being used for a thick skin area such as the back, and a 19mm for the face.
- The **curvature** refers to the shape of the needle as a proportion of a circle. The needle shown is a 3/8 circle needle, as it literally represents 3/8 of a circle. Others exist such as 1/4, 1/2, 5/8 – for skin though, we usually use 3/8.



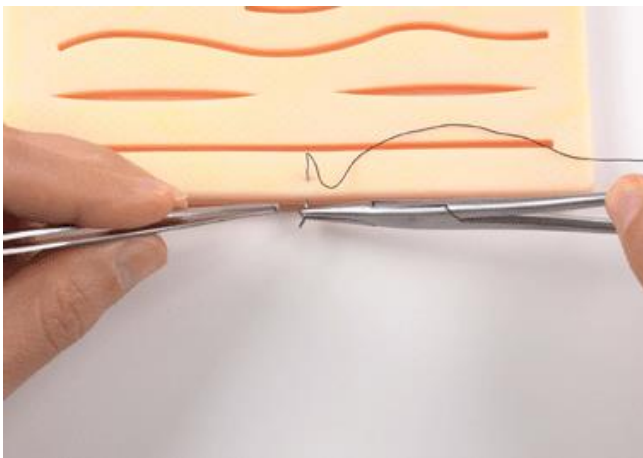
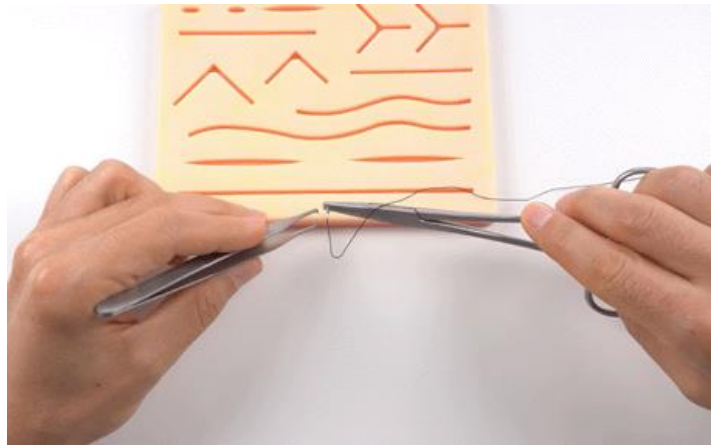
- When putting the needle into the needle holders ('mounting the needle'), it should be placed fairly close to the tip of the jaws. The needle is held approximately 2/3 along the body, closer to the swage than the point.
- Always try to handle the needle with instruments instead of your hands, in order to reduce the risk of injury.
- When placing the needle down, always do so safely to avoid possible injury to yourself or colleagues. We like to use the 'safe position' as shown in the video.



Starting to Suture

When learning to suture, being able to handle the instruments is a crucial first step. In this part of the course, we will show you an exercise to practice before moving on to the next chapter.

- Once you have mounted the needle correctly, use the edge of your pad to practice on.
- The forceps can be used to grasp the edge of the pad and keep it steady while you suture. Try not to grasp it too tight though.
- By pronating at the wrist, the needle is poised over the skin at 90° to the surface, around 3mm from the edge.

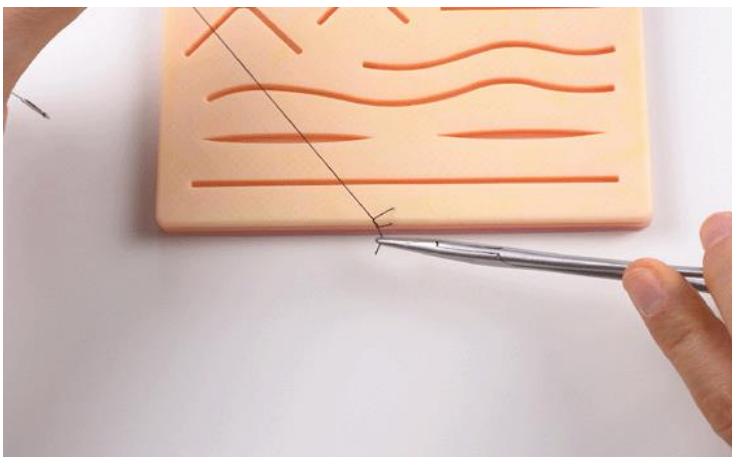
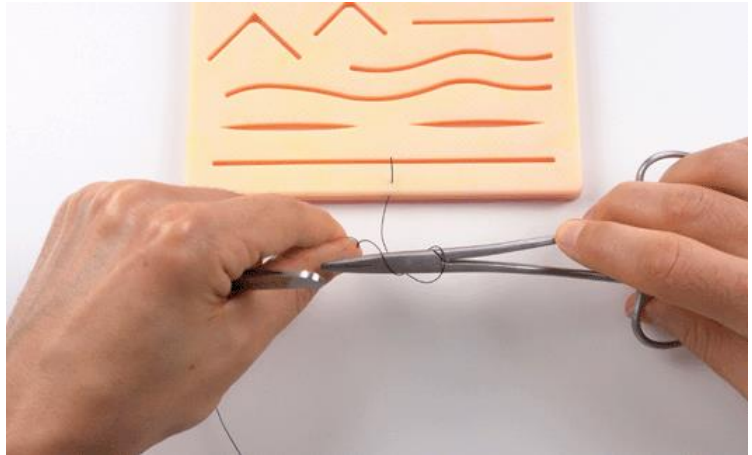


- Guide the needle through, using the same motion as shown in the video.
- Pull the needle through, using your forceps to help you take up the thread slack.
- Use your forceps to place the needle back in the holders, adjusting until they are in the right position.
- Repeat this exercise until you feel comfortable with the suture action.

Tying a Suture

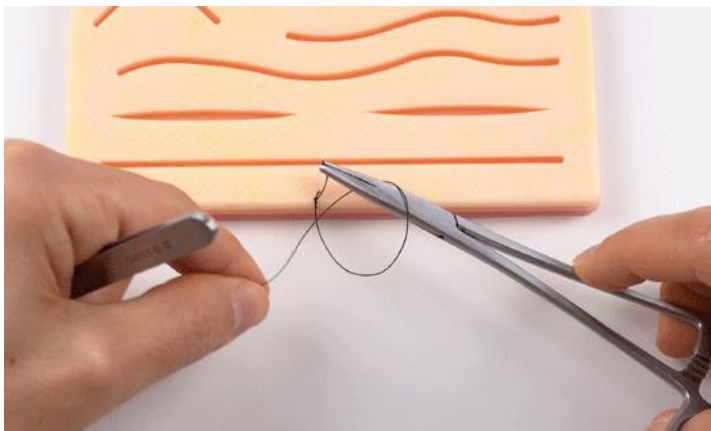
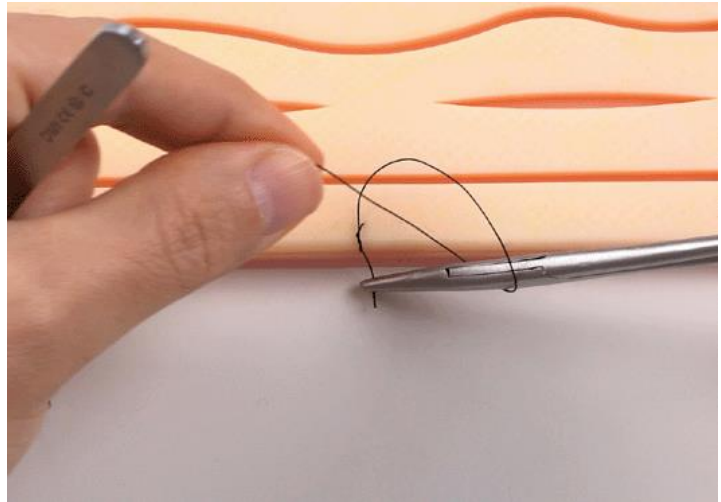
Now that we've mastered the movements that are needed, let's move on to learning how to tie a suture. We've explained the technique step-by-step here, but **it makes much more sense when you watch the video!**

- Pass the suture needle through the pad as you did in the last exercise. The difference here though, is you are going to leave a 'tail' of thread showing.
- Now begin your surgical knot – holding the long end of the thread in your hand, pass this under then over the holders, looping over them twice.



- By pulling the 'tail' through and taking the long thread 'away from you', a knot forms.
- Snug this knot down.

- Now form a single loop by bringing the long thread towards and then away from you, going over then under the holders as you do so.
- Grasp the tail and pull through the loop whilst pulling the long thread towards you. Snug this down to lock your first knot in place.



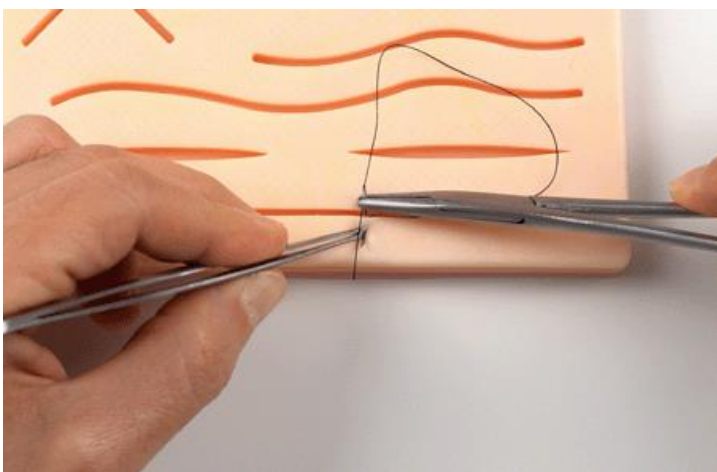
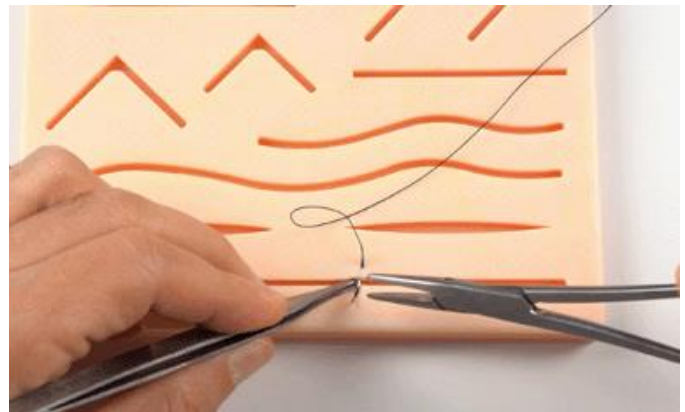
- Lastly, form another single loop by taking the long thread away then towards you, again going over then under the holders.
- Grasp the tail and pull through the loop whilst pulling the long thread away from you. Snug this down to lock your suture knot in place.



Interrupted sutures

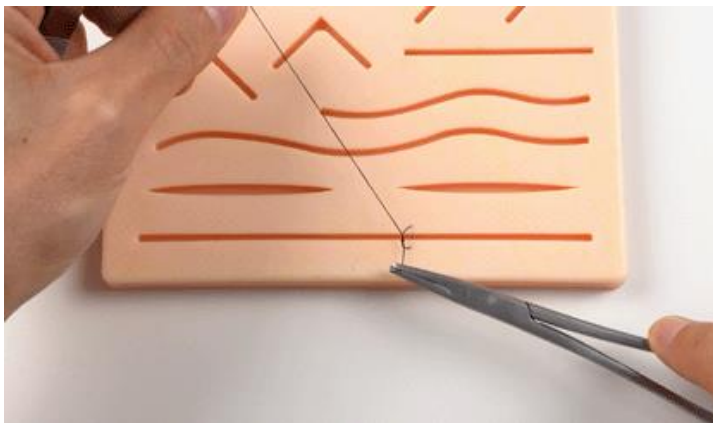
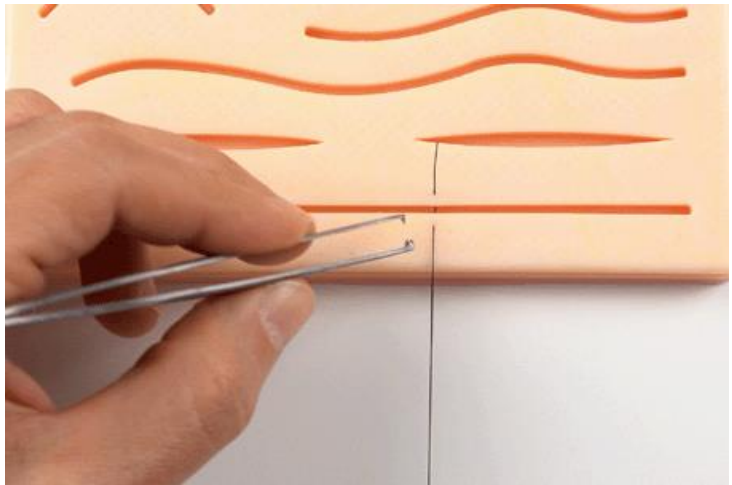
Having practiced instrument handling, placing a needle, and tying a suture knot, we're now ready to start learning how to suture a wound.

- First pass the needle through one side of the wound, in the same way you practiced on the edge of the suture pad earlier.
- Aim to start around 3mm from the wound edge and bring the point of the needle out at around 3mm depth.
- Don't forget to use supination to push the needle along its' natural arc as shown in the video.



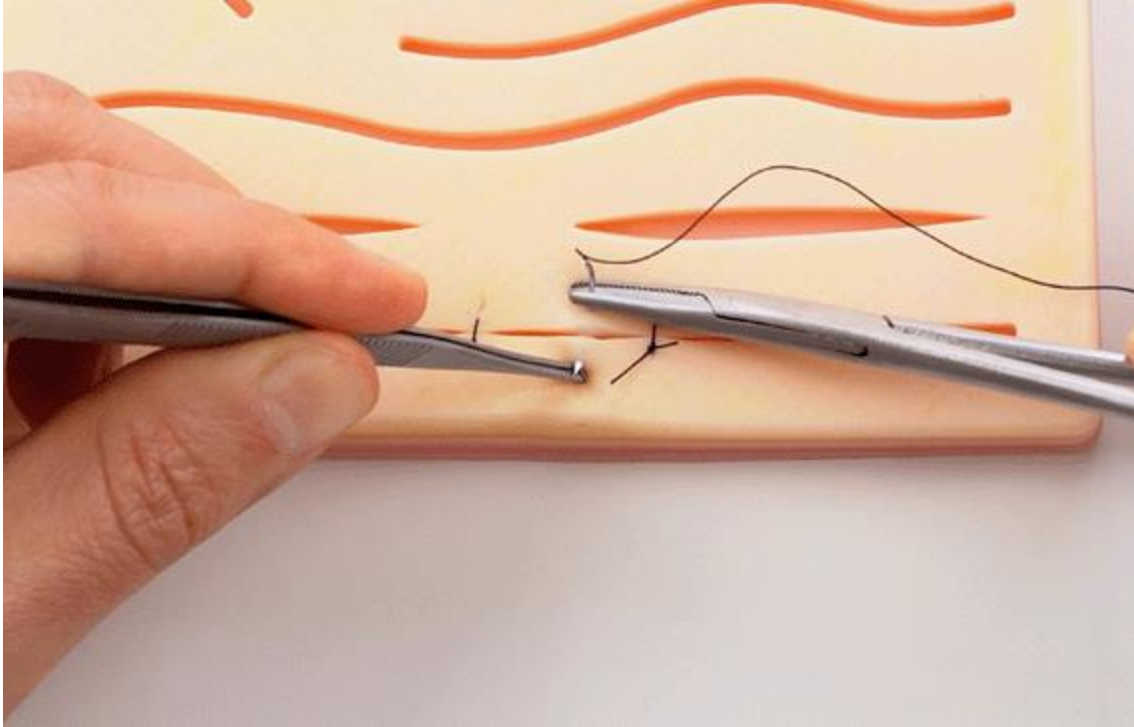
- Now position the needle correctly in your holders and pass it through the opposite side.
- Enter the deep tissue at the same depth you exited from the first side (ie around 3mm in this case).

- Pull the thread through, leaving a tail of thread with which to tie your suture.
- Around 15-20mm is the right sort of tail length.



- All that's left is to tie your surgical knot.
- Don't forget – 2 throws, 1 throw, 1 throw.
- The trick is to make the knot tight enough to close the wound, but not too tight as this could lead to worse scarring and wound healing problems.





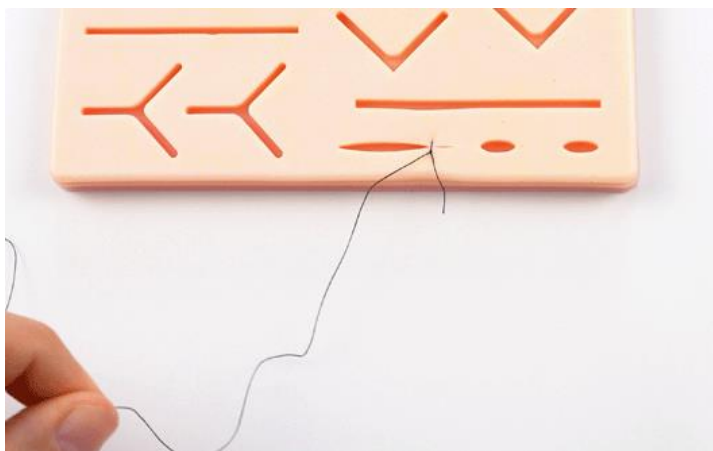
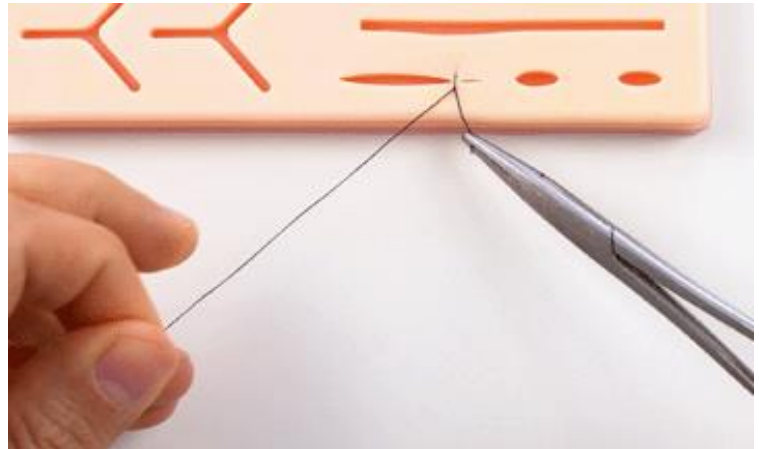
- Now that you've mastered suturing with two passes (passing the needle through one side then the other), try doing it in one pass.
- The single-pass suture needs the wound edges to be fairly close together, so depending on your practice pad you might need to do a couple of double-pass sutures to bring the edges closer first.
- Don't forget to keep the needle entry the same distance from the wound edge as the exit on the other side.
- If your needle point isn't showing enough at the exit, 'feed' your needle through as shown in the video.



Suturing – advanced tip

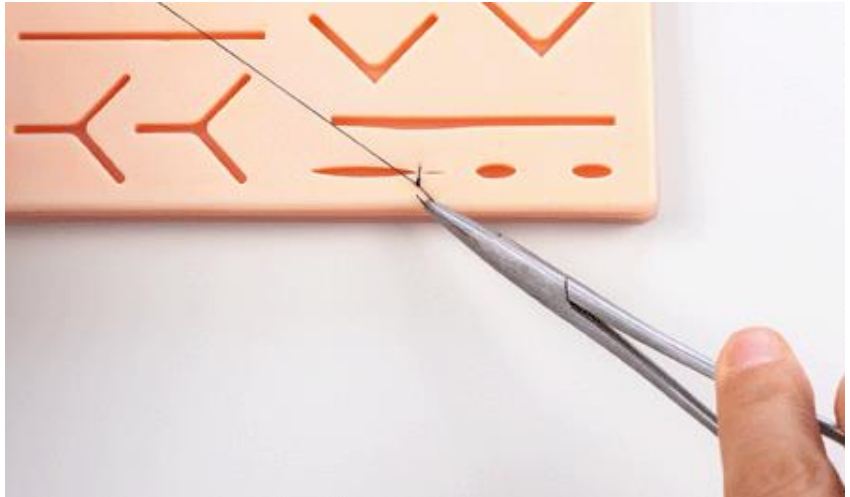
You've now mastered the double and single pass interrupted sutures, which is great – but let's now learn a simple technique that will make you stand out from the crowd and help give the best results you can. This very simple trick helps to:

- Keep your first knot secure when a wound is trying to 'spring open'.
- Place your knots on one side of the wound, allowing for better healing and scarring, and a neater appearance.
- Once your first throw has been snugged down, use the 'pull back' move on the long thread, as demonstrated in the video.



- Now relax and let the thread go loose. Your throw should stay held in place.

- You can now perform the rest of your throws to complete the surgical knot.



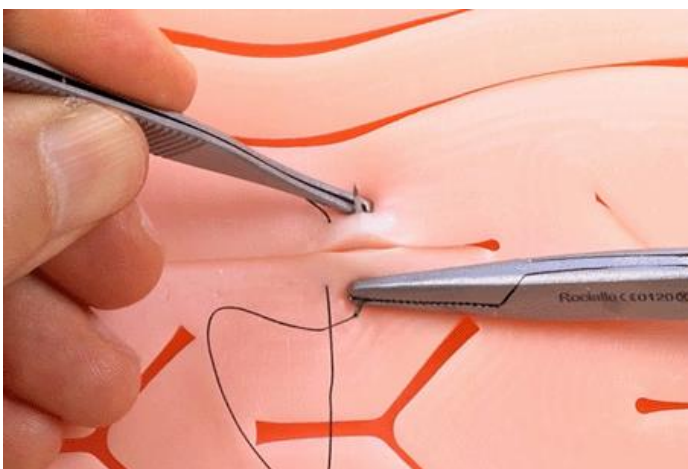
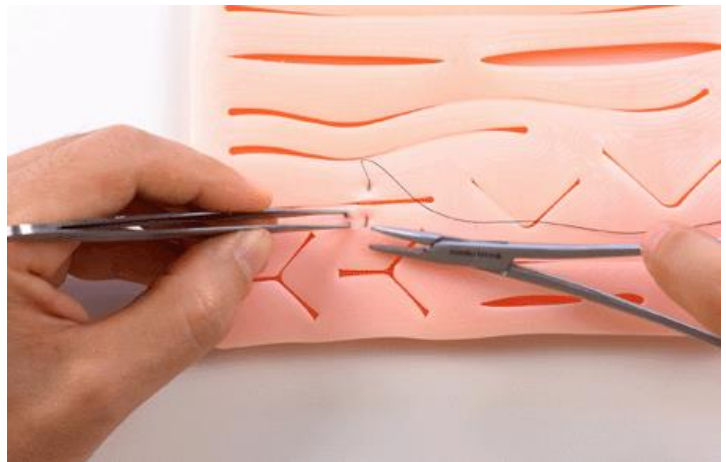
- Repeat the process until the wound has been closed.
- Your knots should all have neatly fallen into place on one side of the wound.



Horizontal Mattress Suture

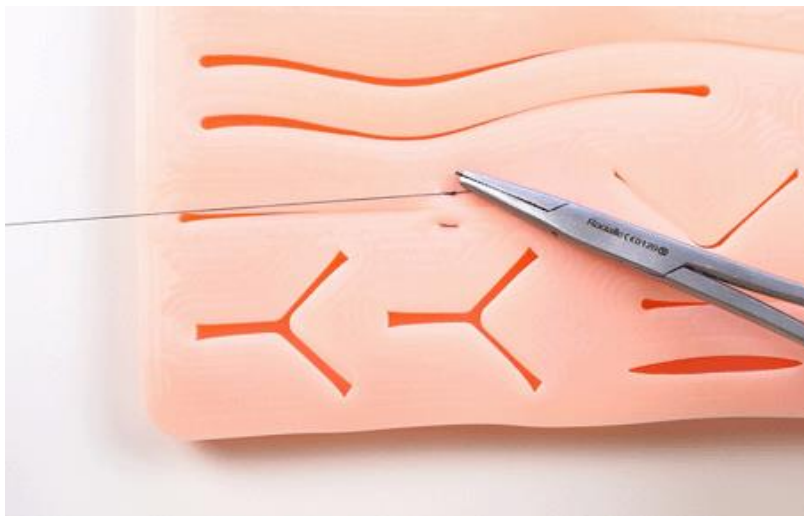
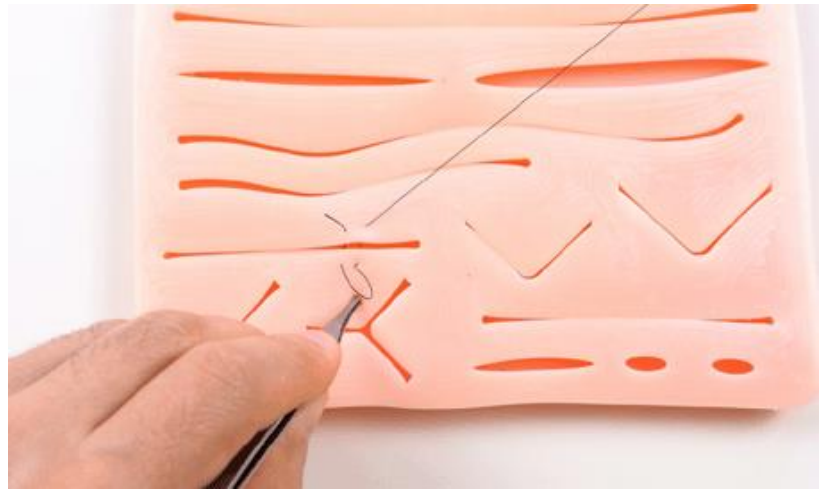
The horizontal mattress suture is a very useful technique to know, as it helps evert skin edges in areas where the skin wants to invert. These areas include the palm of the hand, for example when closing the incision of carpal tunnel release. Everting the skin edges helps with wound healing and scarring.

- Start the horizontal mattress by passing the needle through both sides of the wound, as you would for a standard interrupted suture.
- Don't forget to leave a 'tail' of 15-20mm.



- Now, as demonstrated in the video, place your needle in a reverse position.
- Pass the needle back through both sides of the wound, keeping the entry and exit around 3-4mm along from your first pass.
- Make sure the entry/exit points for the second pass are the same distance from the wound edges as they were for the first pass.

- Now pull the thread through. You should see the loop snugging down to the skin.



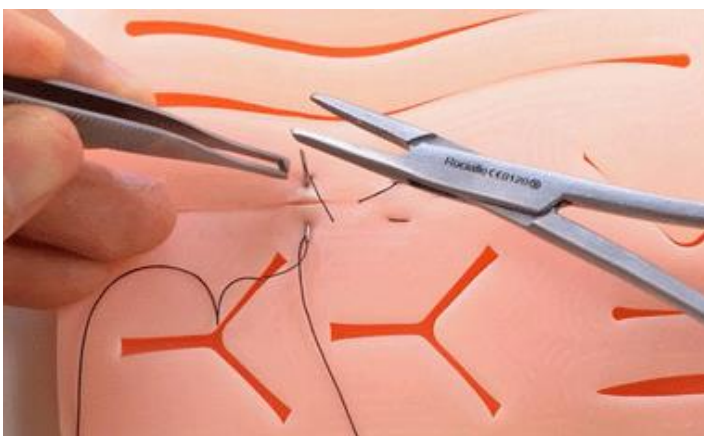
- You can now perform your surgical knot, being careful as always to make the suture snug but not overly tight.
- You can see the suture thread is visible in a horizontal direction, along the plane of the wound, hence the name.



Vertical Mattress Suture

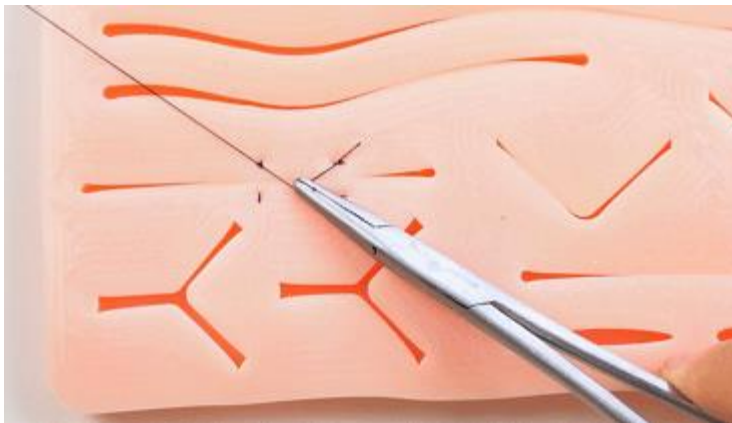
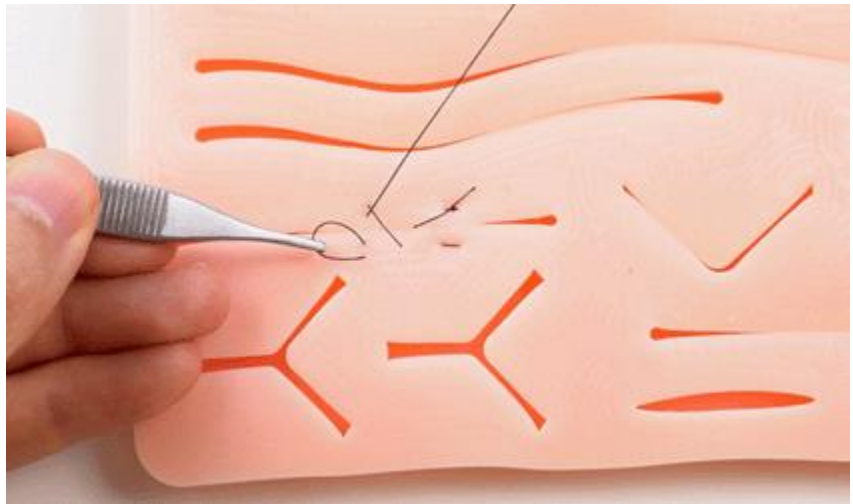
The vertical mattress suture, like the horizontal mattress, helps evert skin edges in areas where the skin wants to invert. The suture lies in a perpendicular, or vertical, plane to the wound, hence the name.

- Start the vertical mattress by passing the needle through both sides of the wound, as you would for a standard interrupted suture, except place it a little further away from the skin edges (eg 5-6mm rather than 3-4mm).
- Don't forget to leave a 'tail' of 15-20mm.



- Now, as demonstrated in the video, place your needle in a reverse position.
- Pass the needle back through both sides of the wound, keeping the entry and exit *in line with* your first pass.
- To do this, the entry and exit will need to lie closer to the wound edges than your first pass (eg 2-3mm).
- The path of this second pass is slightly more superficial (closer to the surface) than the first pass.

- Now pull the thread through. You should see the loop snugging down to the skin.



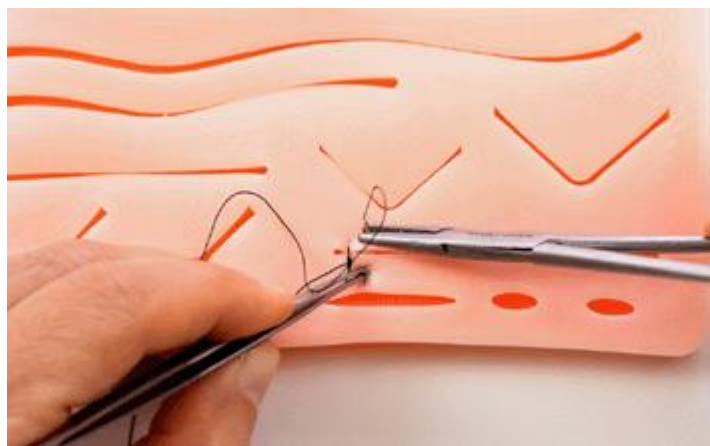
- You can now perform your surgical knot, being careful as always to make the suture snug but not overly tight.
- You can see the suture thread is visible in a vertical direction, perpendicular to the plane of the wound.



Continuous Suture

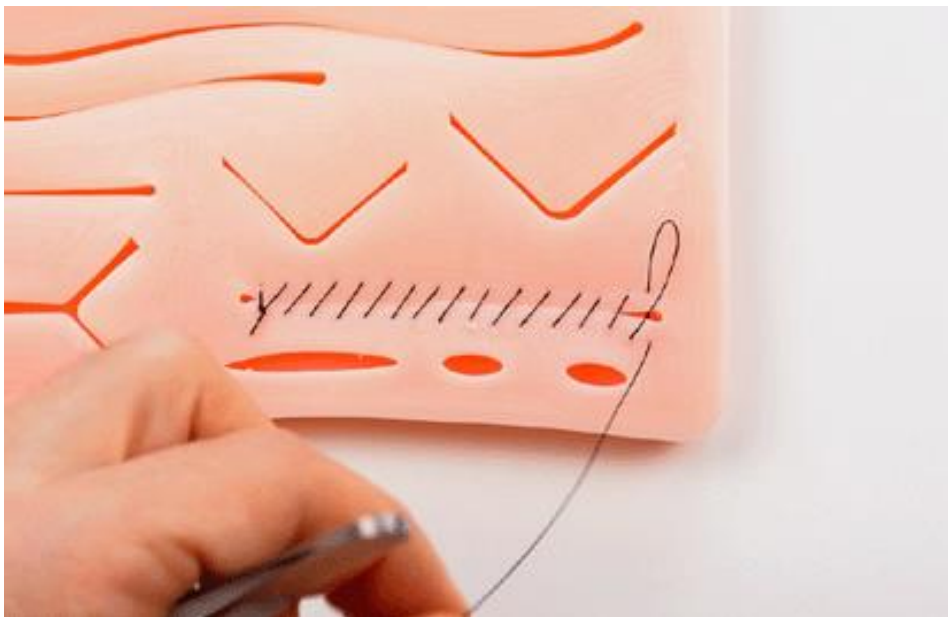
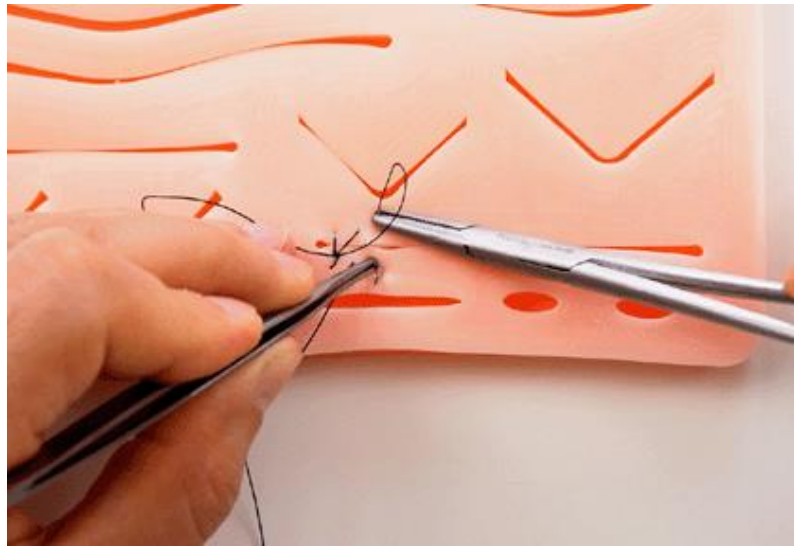
Also known as a running suture, this technique is handy when you need to close a long wound with speed. An example may be a patient who has become medically unstable during anaesthesia. Care should be taken to only snug each throw down, as this suture can easily become too tight and begin to strangulate the skin.

- Start as you would for a standard interrupted suture, but this time don't cut the long thread.



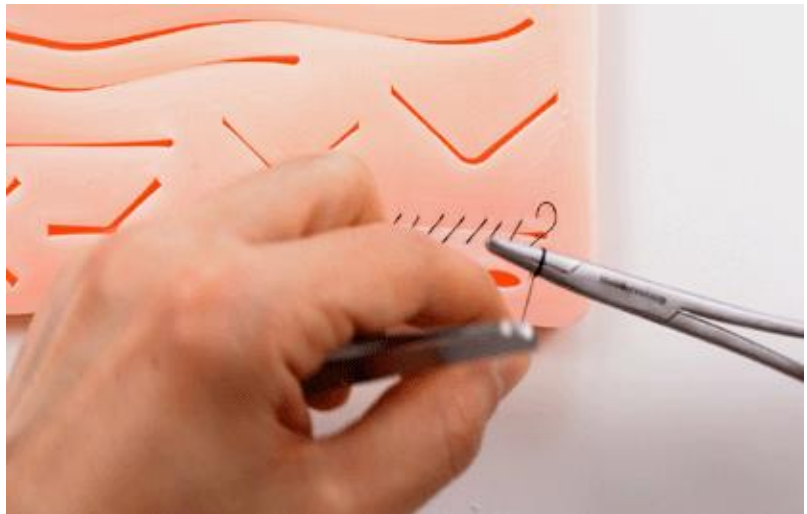
- Place your needle in the position where you would normally place your next suture (in the video this is around 4mm along).
- Pass the needle through both skin edges and pull the thread to snug it down.

- Now place your needle at the next position, and repeat the process.



- You will see the sutures form a diagonal appearance.
- When you place your last pass at the end of the wound, don't snug the loop fully down.

- Perform a surgical knot as you would for the previous suture techniques, using the loop as if it were the 'tail' of your thread.



- Your continuous suture should have approximated the wound edges with no large gaps, but also without undue tension.

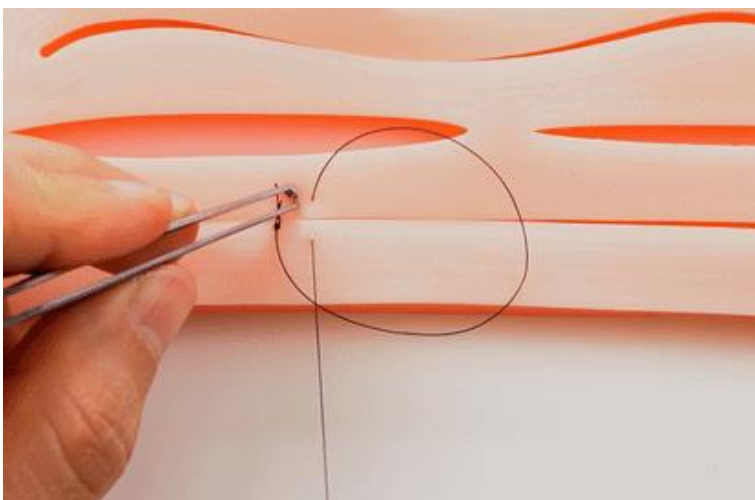


Continuous Locked Suture

Also known as a running locked suture, this technique isn't too different to the continuous suture. This again is used when speed is important, and the locking aspect can help with episodes such as bleeding scalps.

The locked areas can spring open during suturing but keeping slight traction on the long thread can help with this (as shown in the video).

- Start as you would for a continuous suture, but this time when you place your next suture, you are going to pass the needle through your suture loop as shown.



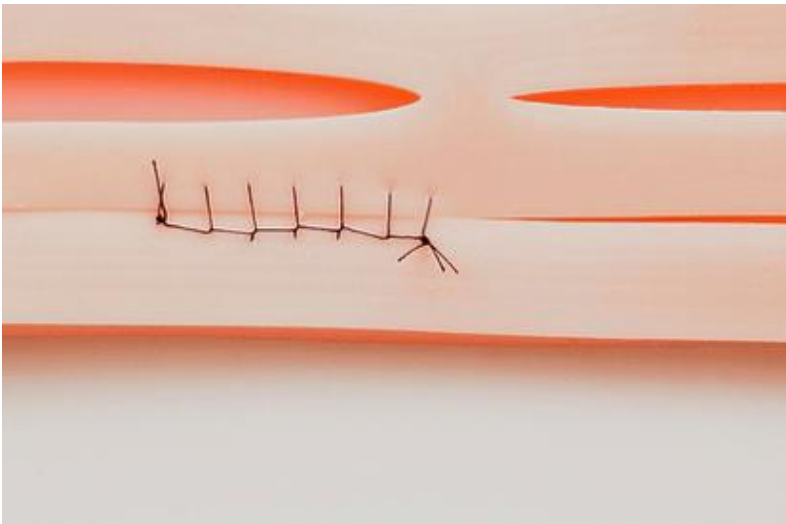
- As you tighten, you will see the loop snugging down on your thread. This looks as if something is going wrong, but it's not!

- As you fully snug the loop down, it will form a neat 'locked' appearance.



- Proceed as you did for the continuous suture, but ensuring your needle passes through the loop on each occasion.
- Keep tension on the long thread to avoid too many of the throws springing out of position.
- Don't pull too hard on the thread though, as this can cause an excessively tight result.

- When you want to finish the suture, leave your last loop free so that this can be tied into your surgeon knot.



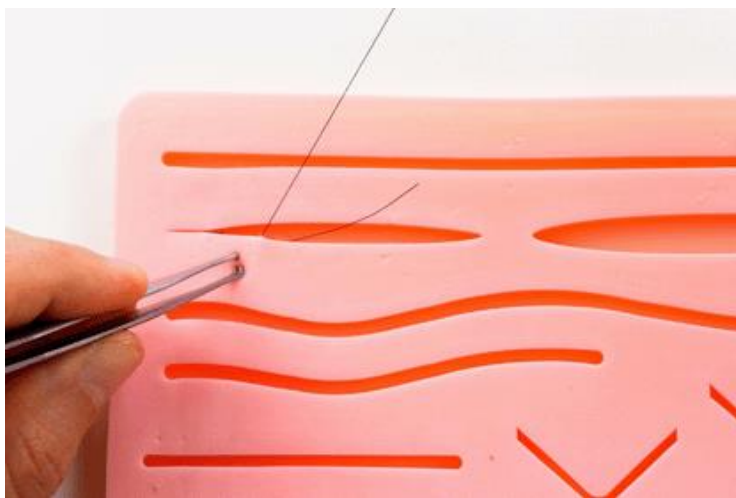
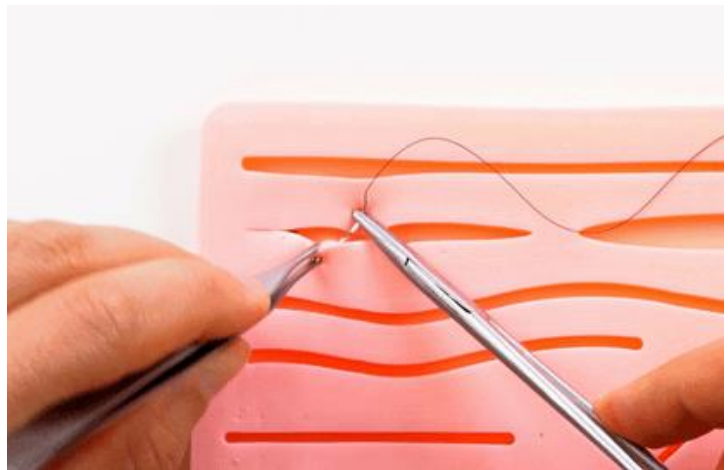
- Your continuous locked suture should have approximated the wound edges with no large gaps, but also without undue tension.

Subcuticular Interrupted Suture

When the wound is gaping or unable to be sutured without undue tension, subcuticular sutures can be placed to bring the wound edges together before placing your skin sutures.

They are dissolving sutures and can take weeks to dissolve, allowing the scar time to build up strength and stopping the wound from 'pinging open' (dehiscing) when the skin sutures are removed.

- The needle is first inserted in the deep tissue (deep dermis in skin), aiming towards the surface.
- You will likely need to use your toothed forceps to help you see better and stabilize the tissue.



- Pass the needle from the deep tissue up towards the surface, coming out around 1-2mm from the surface.
- Use a supination motion to do this, as shown in the video.

- Now enter the needle into the opposite side, directly opposite and at the same depth as the exit point on your first pass.
- Note that you will need to pronate your hand to enable your needle to enter at 90°



- Using a supination movement, pass the needle down to the same depth as you entered on the opposite side.

- You're now ready to tie your knot.
- Try tying as shown in the photo, and then with your threads in line with the wound as demonstrated in the video, to see which is easiest for you.
- Importantly, you will see that the knot lies deep in the wound, giving it less chance of irritating the overlying skin and 'spitting out'.



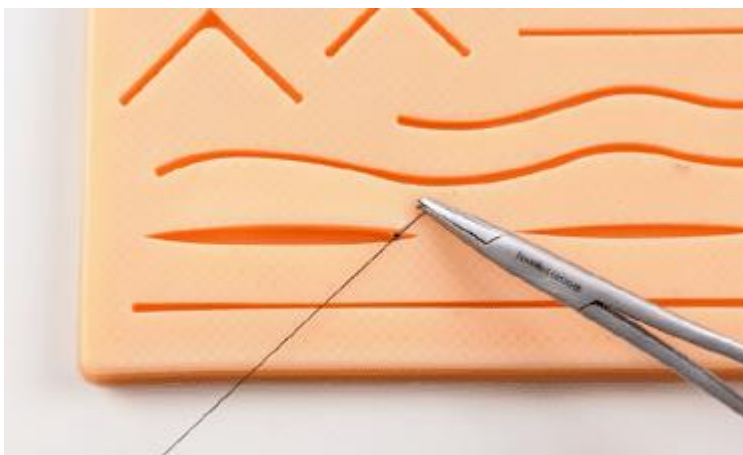
- Your suture should have approximated the wound edges with no large gaps.
- Don't worry if it takes a while to get this right – it's a tricky technique to learn, but a very important one, so keep trying!



Subcuticular Continuous Suture

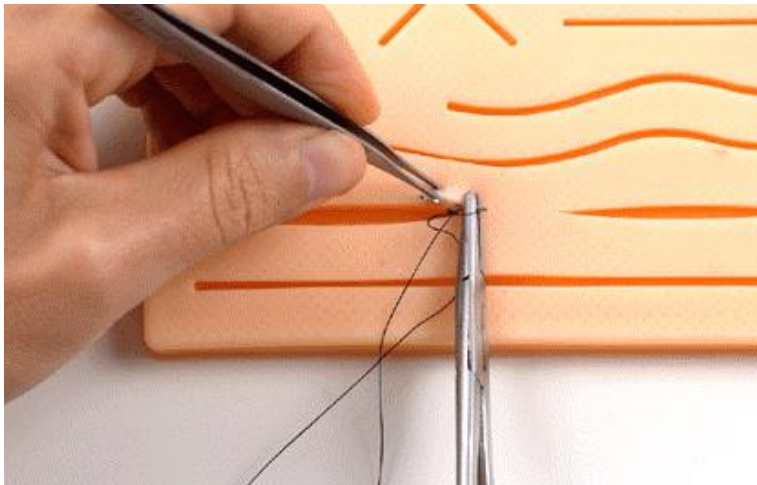
It's time now to put your skills to the test, with a fairly tricky but useful suture. The subcuticular continuous suture can be performed a number of ways, including with a non-dissolving 'pull-out' thread. In our example, we show a technique that doesn't need removal and so would use a dissolving suture. You may need to watch the video a couple of times before trying this!

- First, pass the needle deeply through one side of the wound, close to the corner. The needle starts off quite deep in the dermis and exits even deeper.



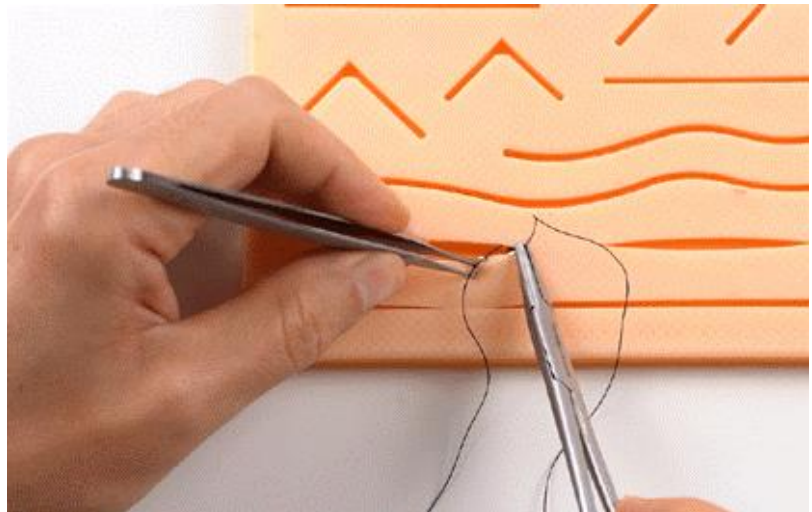
- Tie a surgical knot, then cut the tail close to the knot.

- Using a reverse-needle hold, pass the needle from deep to superficial, so as to exit at the wound apex/corner.



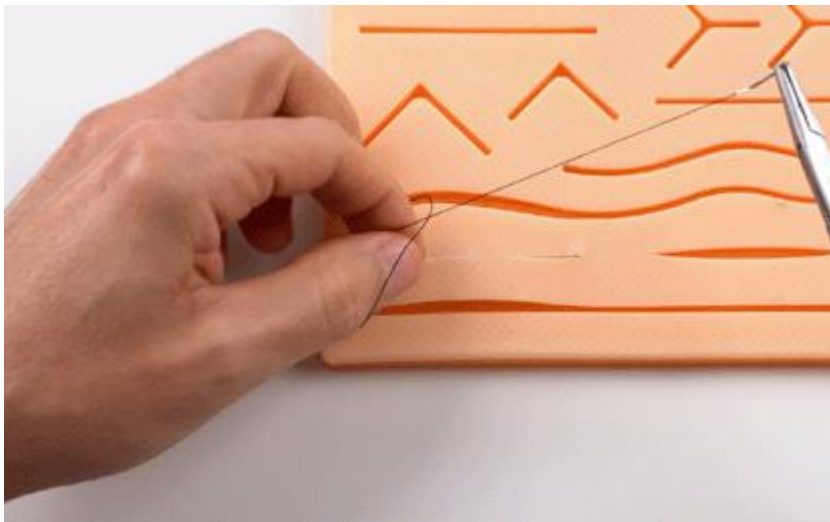
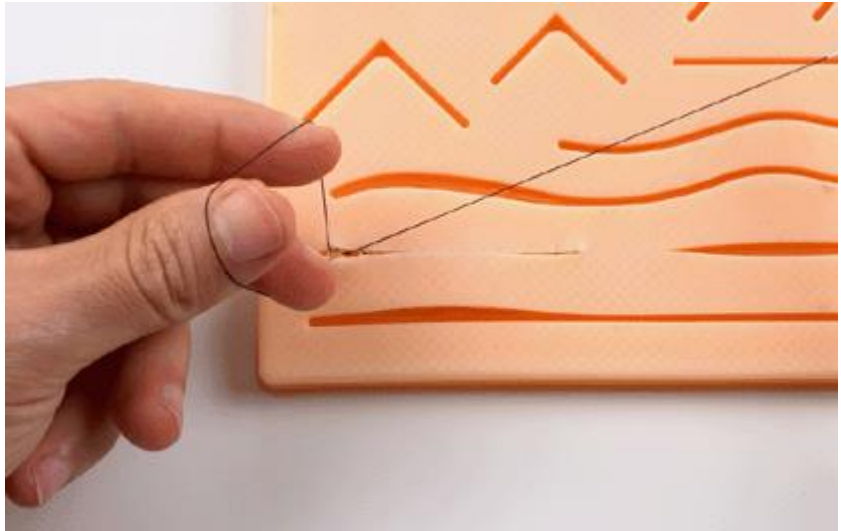
- Now place a stitch through one side, passing your needle 1-2mm under the surface.
- This first stitch starts close to the apex.

- Now repeat on the other side.
- The needle should enter at a point opposite to where it exited on the previous pass, and at the same depth.



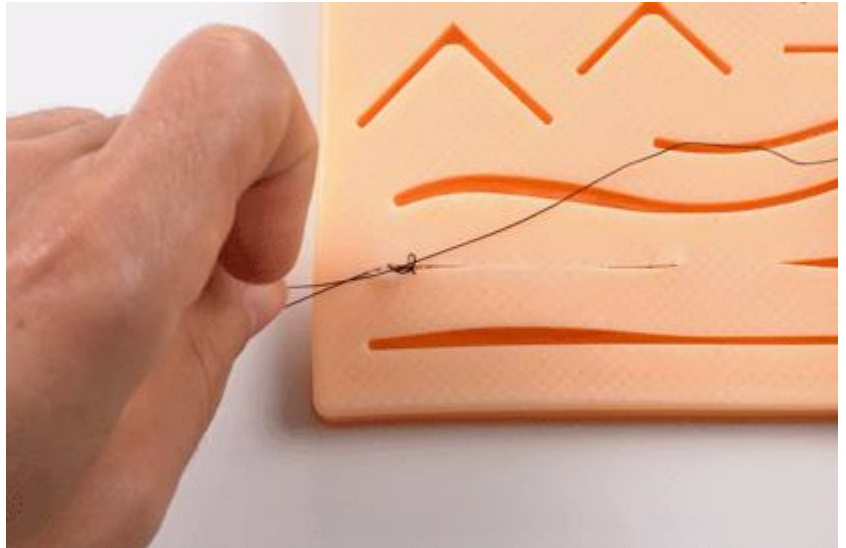
- Keep repeating, gently pulling the thread each time to snug the wound edges together.
- At the end, your last stitch will start superficially, but this time pass the needle deeply.
- This will help to bury your knot and reduce the chance of 'spitting out'.

- Leaving a long loop, an Aberdeen knot can now be performed.



- Whilst using your needle holders to keep the thread under tension, use your other hand to pull the thread through the loop.
- Keep pulling on the thread, using a see-saw motion between left and right hands.

- You will see the loop reduces down into a knot.
- Repeat this step.



- Finally, pass your needle through the loop and gently pull.
- You will see the knot lock down.

- Now it's time to further reduce the chances of 'spitting out'.
- Place your needle just behind your knot, and pass it under the knot into the deep tissue (fat).
- Feed the needle through, exiting a few mm away from the wound line.



- The thread can now be cut flush to the skin.



- Whilst practicing this suture, pull the edges apart and have a look – the threads should be crossing over in a 'railtrack' pattern.



Surgery Skills

Surgery Skills

Learn Develop Excel

We hope you've gained new skills and knowledge to help you throughout your career.

Please remember though, that the contents of this course are meant as a foundation and are by no means 'the only way' to perform things and may not even be 'the best way' for all people. You may be taught other ways or develop your own techniques that differ from those in this course. That's absolutely fine – the important thing is to develop a technique that suits you best, to give the best care possible. Also when first performing these techniques in real life, please make sure you are overseen by an experienced competent person.

Don't forget to visit our site for more information, to sign up to the video course, or to see details of our other surgical courses.

www.surgicalskills.com