

# Knots and Throws



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- Each booklet illustrates one way to perform a skill and it is acknowledged that there are often other approaches. Before using the booklets, students should check with their university or college whether the approach illustrated is acceptable in their context or whether an alternative method should be used.
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# Instrument ties

## Square Knot and Surgeon's Knot



### Definitions

There are many different words you will need to be familiar with when discussing suture, suturing and surgical knots. Sometimes people in practice use the terms throws / loops / wraps to all mean the same thing which can be confusing. We have defined how **we** will use these terms when teaching you how to place secure surgical knots:

- **Suture material** = surgical thread used to create surgical sutures and/or ligatures.
  - (e.g. Nylon)
- **Suture pattern** = the pattern used to close tissues during surgery
  - (e.g. simple interrupted, simple continuous, cruciate and intradermal)
- **A Throw** = Square/surgeon's knots are made up of first and second throws with extra throws on top to secure the preliminary knot. Each throw may have one or more loops/wraps around the needle holder. Throws usually go in opposite directions to each other.
- **A Surgical knot** = a combination of throws of surgical suture used to create a knot that is secure and unlikely to undo.

N.B. Loops / wraps are all used typically to mean the same thing, but it is best to think of throws in terms of the direction you are taking the suture.



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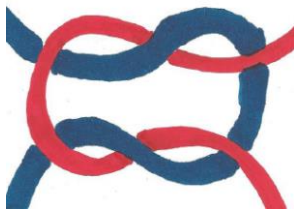
## Knots and Throws

### Square Knot & Surgeon's Knot

Different surgeons have different preferences for the knots they use in different circumstances. Below are two approaches.

#### Square knot:

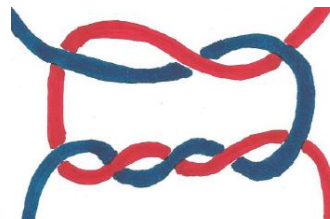
1<sup>st</sup> throw = single wrap/loop  
2<sup>nd</sup> throw = single wrap/loop  
(1+1)



#### Surgeon's knot:

Surgeon's throw = double  
wrap/loop  
2<sup>nd</sup> throw = single wrap/loop  
(2+1)

The double wrap of the first throw gives extra friction which is useful when working with slippery suture material.



| Total numbers of throws (T)<br>(Numbers of loops per throw) |  | <b>Square Knot</b><br>(2T)<br>(1+1 = 2L) | <b>Surgeon's Knot</b><br>(2T)<br>(2+1 = 3L) |
|---|--|--|---|
| Simple Interrupted pattern                                  |  | 3T<br>(1+1+1=3L)                         | 4T<br>(2+1+1+1=5L)                          |
| Simple continuous pattern<br>(subcutaneous or linea alba)   | Start                                    | 4T<br>(1+1+1+1=4L)                       | 5T<br>(2+1+1+1+1=6L)                        |
|   | End<br>(1 more throw than starting knot) | 5T<br>(1+1+1+1+1=5L)                     | 6T<br>(2+1+1+1+1+1=7L)                      |

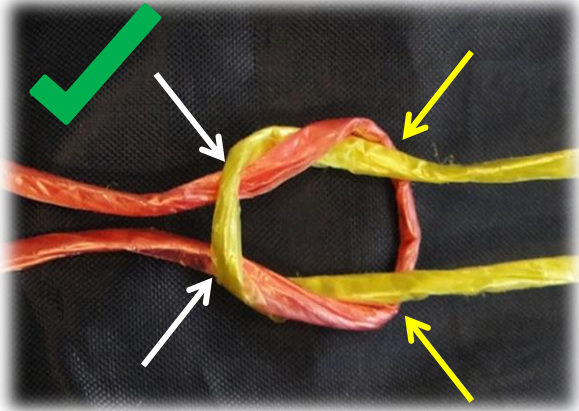


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## Knots and Throws

### Tying a Square Knot (in string)

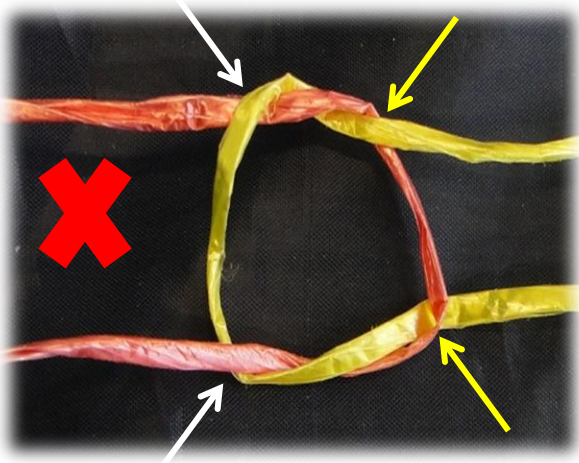


This is a square knot (also known as a reef knot).

Compare it to the other knots below.

On the right-hand side of the picture, both the yellow strands run over the top of the red loop (yellow arrows).

On the left-hand side, both the red strands run under the yellow loop (white arrows).



This is a granny knot. It is not secure.

Compare it to the square knot above.

On the right-hand side of the picture, one yellow strand runs over the red loop and one runs under the red loop (yellow arrows).

On the left-hand side, one red strand runs over the yellow loop and one runs under (white arrows).

Avoid creating granny knots by always following the correct technique.



This is a slip knot or half-hitch, and should be avoided as it is not secure.

Compare it to the square knot (at the top).

Half-hitches form when uneven tension is applied to the ends of a knot.

Even if you perform the correct hand movements but apply uneven tension, an insecure knot will be created.