



## Fly fisher's knots

### Illustrations of the best knots for your flylines, leaders and tippets

*[Martin Jørgensen](#)*

A test in the print magazine Fly Fisherman showed the Trilene and the Orvis knot to be equally strong and on top of that said that they were able to maintain 100% of the line strength. I really have my doubt if that will hold for all types and thicknesses of line, but still it does prove that these could be the knots of choice for the concerned fly fisher.

I personally prefer knots that pass the line through the eye twice - like the [Trilene](#) and the [Palomar](#) knot. My favorite loop knot is the [Surgeons loop](#) which is easy to tie and has served me well. If I need a guiding knot, I tie the [Mörrum Guiding knot](#).

#### Links

[Read the intro to the knot section](#)

[About setting up reel, backing and line](#)

[About tying your own leaders](#)

[Leader and tippet Q&A](#)

## Fly attachment knots

### Palomar knot

A knot that is easy to tie and has a good breaking strength of over 90%. It can be difficult passing the line twice through the hook eye, but pass the tag end though one way first and then back. Then make the loop as small as possible and pass it over the hook. Tighten by first pulling both ends - then the tag end alone.



### Surgeons loop

A loop which can be used to tie on small flies or flies that need to work on the leader. The knot is strong, but the open loop is a bit fragile where the fly wears it, so the knot ought to be inspected and retied regularly. Make sure you do not tie the loop too large as it and the knot has a tendency to grab any material on the fly and lock. This will often lead to a fly swimming backwards...

[We have a whole article on the surgeon's knot and loop.](#)



**Duncan loop**

The classical loop for flies that need to work freely on the tippet. Fairly easy to tie and can be tightened according to taste.



**Orvis knot**

Can form a loop that tightens when under strain. Its strength almost compares to the Trilene knot with a 95% average.



**Figure 8 loop**

An easy-to-tie loop that leaves the line and eye in a straight line. It is a bit difficult to tighten in a manner that results in a small loop. A too large loop will often catch the fly or some material and leave the fly fishing sideways or backwards. The figure 8 loop is also great for making loops on leader butts and tips

and good to use on tippets if you want a loop-to-loop connection between tippet and leader.



#### **Trilene knot**

The breaking strength is very high for this knot; very close to 100% for some lines and diameters and almost always above 90%. Do not cut the tag end too close. The knot has a tendency to untie itself after many casts.



#### **Mörrum Guiding knot**

A guiding knot well suited for up or down eye flies on heavy tippets – especially salmon flies. The knot is easy to tie with a good breaking strength. Tighten the loop section first and then work it slowly to a position in under – and almost in – the hook eye.

The direction of the tippet will be at an angle to the eye, and hence the knot is not suitable for straight eyed hooks. On up- and down eye hooks on the other hand, the tippet will be parallel to the hook shank, and guide the fly nicely in the water.



#### **Improved clinch knot (not recommended)**

This is a very common knot, but even though it seems to look much like the Trilene knot, it's very weak in comparison. Down to 60% breaking strength in some cases. I do not recommend using it.



## Leader knots - mono to mono

### Blood knot

A knot used to tie two monofilaments together, i.e. tippet to leader or two pieces of a knotted leader. The knot is a bit difficult to tie, but can be tied without tools with some practise. It is compact and has a high breaking strength and leaves the line absolutely straight. The number of turns can be varied, but 3-5 turns work well on most lines. Cut the tag ends very close to the knot.



### Surgeon's knot

This knot is normally used to tie two monofilaments together, i.e. tippet to leader. The knot is fast and easy to tie and has a high breaking strength. It does require one side to pass through the loop and is more bulky than the Blood knot. It also leaves a small angle on the line. The number of turns can be varied, but two turns work best on most lines.





## Leader knots - mono to fly line

### Needle knot

An excellent knot for attaching the leader to the fly line. It yields a very neat, straight and strong transition between the monofilament leader and coated fly line.

It requires that you pass the mono through the core of the fly line by poking a hole with a needle. Cut the leader at an angle with a pair of scissors to make this process easier. Pull 10 centimeters or 4 inches of leader butt through core and out through a hole in the side of the fly line coating and tie the knot.

PS: I previously named this know a nail knot, which it's not. Sorry.

- Martin



### Nailless nail knot

An fine knot for field attachment of a leader to the fly line. It is almost as straight and strong as the above nail knot, but can fail if the coating is pulled off the fly line core.

The advantage is that it does not require tools other than a line clipper. Lay the butt of the leader along the fly line with about 10 centimeters or 4 inches overlapping. Fold 3/4 of the tag end of the butt back towards the end of the fly line and fold it over and around the whole assembly in 4-6 tight loops close to the end of the fly line, working your way back towards the loop formed by the mono. Hold the loops tightly between your fingers. Pass the mono tag through the loop and moisten the whole knot before tightening the mono. Work the knot slowly together arranging the loops nicely. Tighten by pulling both ends of the mono. Do **not** pull the fly line before the knot is very tight! Trim the lines as close to the knot as possible and test with a firm pull in fly line and leader.



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**From: matt - Full name and email anonymized** [Link](#)

Submitted March 20th 2012

I stripped back the coating on the fly line just leaving the nylon braid and tied an albright knot to the leader..The knot diameter is the same as the nail knot....Anyone know any reasons why this wouldnt be suitable. I'm new to fly fishing.

**From: Brendan - brendanw1994-at-gmail.com** [Link](#)

Submitted December 2nd 2011

AMAZING! All my life since I was about 8, I have been using half blood knots and clinch knots for fly fishing, spinning and bait fishing. (I am now 17) And just decided to do some basic test without a gauge on some knots.

The unimproved and improved Clinch knots are horrible compared to the Trilene, Palamar and Orvis knots.

I can so simply break 6lb line (just what was lying around) on the half blood knots and the clinch knots whereas with the aforementioned other 3 it's much much harder... regardless of how similar the Trilene knot looks to the clinch knot and half blood knot, it's at least 1.7 times stronger.. which is a huge difference.

From now on I will be using the Trilene knot in place of everything I used a half blood knot and clinch knot for.

**From: Tony - kleinboet-at-telkomsa.net** [Link](#)

Submitted October 18th 2011

When forming the loop for the surgeons knot, give the loop a half twist before passing the ends through. The tag end or dropper will stand out at exactly 90 degrees to the leader. Stops those pesky weighted nymphs and other flies wrapping around the leader.

### GFF staff comment

**From: Martin Joergensen - martin-at-globalflyfisher.com** [Link](#)

Submitted October 10th 2011

Anonymous,

Also check out our [Q&A where I added your question and an answer.](#)

Martin

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**From: Ron - ronaldlomas-at-comcast.net** [Link](#)

Submitted October 10th 2011

For Anonymous- When the fly line has a loop in the running line for attachment I make a loop in my backing using any of the following knots- Bimini, spider hitch or 5 turn surgeon's knot. Now all you have to do is attach the flyline loop to loop to your backing.

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**From: Anonymous** [Link](#)

Submitted October 9th 2011

how do i tie backing on to new fly line with a loop on it

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**From: Gary - Full name and email anonymized** [Link](#)

Submitted July 10th 2011

Quite good, got me on the right track!

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**From: buzzer10 - smudger-g-at-hotmail.com** [Link](#)

Submitted December 15th 2010

found this artical very helpfull as ive just picked up a fly rod. many sites that give info but not as indepth or explaining things so i a novice can easily understand very helpfull.

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**From: george - snickers2walk-at-yahoo.com** [Link](#)

Submitted June 26th 2010

Info was quite helpful.

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**From: Hugh Clark - greengrass-at-windstream.net** [Link](#)

Submitted May 16th 2010

Phil D's method for the needle knot is a revelation! Went nuts trying to do one on a 3wt. Off to the shop to get it right! Thanks...

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**From: Phil D - fishbird3-at-gmail.com** [Link](#)

Submitted March 29th 2010

About the Needle Knot -- Suggest you try the following method to solve problems of small fly line diameter and needle eyes too small for leader butts. Easier than it sounds, and makes a nice finished knot. Cut fly line off square. Use point of unthreaded needle to start hole up fly line core. Then reverse the needle and work the eye end up into the fly line core about 10 mm. Against the rigidity of the needle inside the line, use a razor blade to make a careful small cut in the outside of the fly line at about 8 mm. Grip point of needle and carefully pull the needle back out of the end of the fly line just past your cut in the side of the line, and then push just the eye of the needle out through the cut. Thread the small end of the leader through the needle, then grip point of needle and pull it out of end of fly line. Pull the entire leader out end of fly line, except for leaving several inches of the leader butt sticking out the side of the fly line. Tie the knot as shown in picture. Many leader butts are too stiff to wrap well in the knot. Cut the butt off at a diameter that will wrap the knot, but not so small that the leader makes a flimsy hinge where it emerges from tip of fly line. Coat uneven spots with flex glue. And there it is !

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**From: Stephen Clarke - Redstarr-at-xtra.co.nz** [Link](#)

Submitted March 15th 2010

I tied 20 clinch knots last night and 20 trilenes, then pulled them to failure. The clinch knots all failed at the knot and noticeably with less pressure needed. Only 2 trilenes failed at the knot 18 were snapped mainlines. I used 4lb Xcelon.

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**From: bob - buonaccorsi-at-astound.net** [Link](#)

Submitted January 30th 2010

nail knots are a breeze if you pull the thin end of the leader through first, starting a short distance up the line from the end. Pull through till there is enough of the butt end of the leader left to make the knot and proceed.

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**From: Paul Kalbrener - PHKalbrener-at-aol.com** [Link](#)

Submitted August 5th 2009

John, I'm not sure if I completely understand what you're trying to do, but I have been using needle knots for a couple of years now and the way I do it is to trim the butt end of the leader to a fine taper with a razor blade, I then thread the tapered end of the leader into the eye of the needle, bend it over to form as little resistance as possible. Then insert the needle into the fly line and pull the needle and leader through the fly line using a small pliers.

With a little practice I can trim 1 - 2 inches of the leader to a fine taper which makes it all much easier to pull through, it also helped me when I dug through my wifes sewing kit and found a small needle with a eye large enough to easily fit the taper into.

hope this helps

Paul

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GFF staff comment

**From: Martin Joergensen - martin-at-globalflyfisher.com** [Link](#)

Submitted August 3rd 2009

John,

The needle knot where the needle goes through the fly line is tricky exactly for the reason you mention - keeping the hole open while you poke the leader through. Two things help:

1) Use an oversize needle. As you have notice the hole closes anyway, so working the hole larger is usually no problem. I have also worked with a hot needle sometimes, but this requires some delicacy in order not to melt the coating completely. I have also tried pressing the needle through the coating cold and then heating the part outside the fly line. This is easier to control, and makes the hole stay open when the needle is removed after cooling.

2) Cut the leader at an angle with a knife, razor blade or sharp scissors. This forms a tip, which is a lot easier to pass through the newly formed hole. I can read that you have done this already.

If none of this works, consider a [nail less nail knot](#) tied on the outside of the line or an [Albright knot \(used for backing here, but it works for leaders too\)](#) where the fly line is doubled back as shown here.

Tying the thick butt of the leader on to the supple fly line is a menace no matter what, so have patience.

Hope some of this works for you.

Martin

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**From: John Buckley - buckley-at-inebraska.com** [Link](#)



Submitted August 3rd 2009

I've just spent an hour trying to tie a needle knot, and finally gave up. Clearly, I'm missing something. Is this knot intended for any type of line? I'm trying to use it to attach a 3x tapered leader to a WF 7 line. The tip of the 7 weight line is not much larger than the needle to begin with, and after pulling the needle out the line collapses shut again, and the hole in the side of the line disappears. It seems impossible to shove the (sharpened) butt of the leader up into the line, let alone out through the exit hole. Any advice?

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**From: MATZ - mzirkle-at-gmail.com** [Link](#)

Submitted June 23rd 2009

For the Orvis knot lovers...I have also used the Orvis knot when attaching leader to tippet, aligning the leader and tippet in the same manner illustrated above surgeon's knot then tying the Orvis knot.

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**From: Hal - halrose-at-aol.com** [Link](#)

Submitted March 23rd 2009

After two years of Fly fishing on the Musgeon River in Michigan for Steelhead I just came to the conclusion last weekend that the reason the fish keep snapping off my tippet is two fold. One is that the "Improved Clinch" that I have been using for over 40 years does suck and that the new Flourocarbon leaders are far superior to the standard nylon tippet. I ran a dozen tests using a new fishing scale and came to the exact conclusion that the "Improved Clinch" may better than an "Unimproved" Clinch but it really does suck and will lose you fish. Thanks for posting this site to give some validation to my personal testing and options for better performing knots. P.S. I am going to try the Orvis out, but will be testing it myself after what I have gone through....Knot that I don't believe you.... Hahaha

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**From: Leonard Williams - lbwilliams-at-sars.gov.za** [Link](#)

Submitted January 28th 2009

Hi from South Africa. I love dry fly fishing with very light tackle. Im interested in finding a knot to the fly where the tippet is a few inches from the fly outside the water. This makes the fish less wary to take the fly. Assistance will be appreciated

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**From: Dick K. - catchatrou-at-gmail.com** [Link](#)

Submitted August 19th 2008

Well, its funny to me that so many people seem to love the "nailless nail knot". There is a reason why this knot has been carried down from generations long ago...its a snell knot. And a snell knot is what was used by early fishermen before hooks had "eyes". The nailless knot is just a slight variation of the snell for tying lines together. Its probably one of the oldest and best knots ever.

But why are we all debating knot terminology, we should be out there fishing!

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**From: Robin rrhyne56 - rrhyne56-at-gmail.com** [Link](#)

Submitted May 14th 2008

That nailless nail knot is quite handy! A few weeks ago I took my brand new bamboo rod out to fish for the first time. Stopped and bought a line on the way to meet my friends. Got there, took delivery of reel in the parking lot where we were embarking on our creek trip. I realized that I needed a loop in the end of the line in order to attach my furled leader. The nailless nail knot secured a thoroughly adequate loop that performed well all day and has since been enhanced with some Loon UV Wader Repair.

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**From: Dave - dave-at-lodelink.com** [Link](#)

Submitted January 10th 2008

I have come at fly fishing from a long history of spinning and baitcasting for large freshwater fish. I have always used a Palomar knot, and I carried this into fly fishing. Every once in a while, I carefully tie a clinch knot to see if I should switch to this much easier knot. But, each time it breaks in my hands much easier (I don't even need a scale!). You are only using 60% of your tippet with a clinch knot. Switch from 4x to 6x, use a Palomar, (or other high strength knot) and get more bites!

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**From: jan johansen · jany-at-blueyonder.co.uk** [Link](#)

Submitted October 1st 2007

Hi Martin,

I use the needle knot on all my fly lines now for a couple of years, its far far the best way to present your lines thanks Jan

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GFF staff comment

**From: Martin Joergensen · martin-at-globalflyfisher.com** [Link](#)

Submitted August 5th 2007

Justin,

The knot grips the fly line coating very firmly, and will "bite" into it. The only times these knots seem to fail is when the coating comes off the fly line too easily. I have never had one of these nailless nail knots fail on me (knock on wood!).

Martin

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**From: Justin** [Link](#)

Submitted July 30th 2007

I don't understand how the nail knot is so strong. It seems like the whole knot could "slip" off the fly line. I realize it's time tested, but it just don't seem intuitive.

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**From: bill from SCOTLAND · billyvonne-at-hotmail.co.uk** [Link](#)

Submitted June 18th 2007

Hi,i also have used the improved clinch knot for half a century, very seldom letting me down like C W(smallie)BOTTOM. I like to wrap at least 6 times round main line pass back through loop next to the eye then back through the loop above.wet this and pull on main line only gently to tighten,then when in place only then pull on the tag end firmly.REPEAT main line pull then tag end pull and dont trim off too close.I also always use this knot when worming and spinning for salmon and never and never encountered many problems.GOOD LUCK from BILL.

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**From: John · jvandervort-at-gmail.com** [Link](#)

Submitted April 19th 2007

Yep, neither of the nail knots is really a nail knot.  
[www.killroys.com/knots/nail.htm](http://www.killroys.com/knots/nail.htm)

They look more like a noose tied in rope.

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**From: Clyde Stauffer · cstauffer-at-cinci.rr.com** [Link](#)

Submitted February 6th 2007

Partly for Adrian, but also for general:

How about a loop to loop connection. That is what I have with all my lines and leaders (except those few where I won't be changing leaders). Various ways to put a fancy loop on the end of the fly line, but on a new line I just make an end loop, whip it (same idea as the nailless nail knot above) and coat it with some fly head cement. For leaders I tie a Perfection loop in the butt end of the leader (and work hard and slowly to get it tight :-). Maybe Martin would add an entry on the Perfection loop to the above.

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**From: Jymmy** · [jymmy80-at-yahoo.com](mailto:jymmy80-at-yahoo.com) [Link](#)

Submitted January 5th 2007

Orvis knot is the king. I'll never tie a clinch for fishing again. Look for the Ligature Knot for line-to-line connections, its just as good of an improvement over blood knots, and much easier to tie.

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**From: Tom Murphy** · [tom.castafly-at-gmail.com](mailto:tom.castafly-at-gmail.com) [Link](#)

Submitted January 1st 2007

If I might be so bold as to correct you on your knots. Your first leader to fly-line knot is in fact a needle knot. So called because a needle is used to first penetrate the end of the flyline. Your second knot is in fact a nail knot as a nail is used to take the wraps of nylon. The nail is then gently removed, the tag end is pushed through and the knot tightened. The nail can be used for both knots.

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**From: Nicolas Olano** · [nicolasolano-at-bellsouth.net](mailto:nicolasolano-at-bellsouth.net) [Link](#)

Submitted December 14th 2006

Duncan Loop is good, easy and effective, but once it clinches after a strike it has to be redone or you loose about 50% strenght.

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**From: adrian** · [hunter12-at-australiainmail.com](mailto:hunter12-at-australiainmail.com) [Link](#)

Submitted September 18th 2006

Wish there was one for sinking lines and how to attach mono to sinking flylines when wetlineing rivers has anyone got any pic's, diagrams onhow it is done?

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**From: Graeme** · [ImpactG-at-new.co.za](mailto:ImpactG-at-new.co.za) [Link](#)

Submitted September 5th 2006

The Morum Guiding Knot is the SAME as the Duncan Loop! - great Knot(s) though. Orvis knot does look interesting - hope its good on 6 and 7X tippet. (Will know tomorrow!)

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**From: Aytch** · [aytch101-at-yahoo.com](mailto:aytch101-at-yahoo.com) [Link](#)

Submitted September 4th 2006

The Orvis knot rocks! I used to use the clinch knot to tie flies on my tippet, but never again! The Orvis knot is easy to tie and fast - I switch flies more often now if there's no action.

**From: Doug - shmish-at-gmail.com** [Link](#)

Submitted September 2nd 2006

I tested out some of these knots, and the Palomar and Orvis knots did seem to be better than the cinch. However, I had extreme difficulties in tying these two knots when using very small tippet.

**From: C W (SMALLIE) BOTTOM - CABOTFLY-at-NETZERO.NET** [Link](#)

Submitted July 1st 2006

I use the improved clinch knot! Have been for over 40 years. It has served me well. I will use tomorrow on my splendid local stream. Those who dislike this knot may not be tying it correctly. A possibility!

**From: marylousue1-at-yahoo.co.uk** [Link](#)

Submitted March 10th 2006

Where can I learn how to join the leader to the fly line using the inch worm knot?

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More stuff to look at on [The Global FlyFisher](#)

These other stories on "[Tackle - The rods and reels and much more](#)" might also interest you:

### Production leaders

**Factory:** What is production leader tying? Tying more than 2 leaders at a time! But, if you are like me, you find out that tomorrow you may go fishing, so you scramble to tie just enough leaders (usually 2) to handle the day and go on with life. Go to the story



### AquaFly flybox

**Designer box:** Imagine an iMac of the first generation as a flybox: cool and soft shape, great color and translucent. That's what the AquaFly flyboxes are. GFF

partner Martin Joergensen has been using one lately. Read his review of this roomy and practical flybox here



More about Tackle

A few random articles for your entertainment

### TMC ThroughWing Burner Mayfly

Tired of making wings with too many diversions from time to time? See if the new tool from TMC can help you burn the wings perfectly every time or if you still have to fold and cut like an used hair dresser.



September 15th 2006

### A Passion for Tarpon

"A Passion for Tarpon" can almost be considered two books inside one cover, as there is an alternating cadence where chapters of instruction are followed by chapters which transcribe a discussion between the author and some of the legends of fly fishing.



March 22nd 2012

### Old Hickory

If Rodney Dangerfield were a fish, he'd probably be a hickory shad. They just don't get much respect. This article by Mark Dysinger aims to set that straight and give the shad the attention it really deserves from fly anglers.



February 23rd 2005

### South Platte Podcast

Colorado's white winters shouldn't give you the blues! Follow GFF partner Steve Schweitzer as he and his family fish the snowy Cheesman Canyon. Steve discusses the 4 plights of the river, flies to use, his "On-Air Hat" and how GFF has over-glorified the fishing gods.



December 2nd 2007

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