

Plaiting a Plexus

The brachial plexus is an iconic structure known to anatomists everywhere. How to teach it varies from tales about dancing partners, mnemonics about the temperature of beer, or just rote learning. The plexus is a network of nerves formed from the anterior rami of the four lower cervical nerves and the first thoracic nerve (C5,C6,C7,C8,T1) that extends from the spinal cord, over the first rib, into the axillary region and to the arm. It provides the afferent and efferent nerve fibres to the chest, shoulder, arm, forearm and hand.

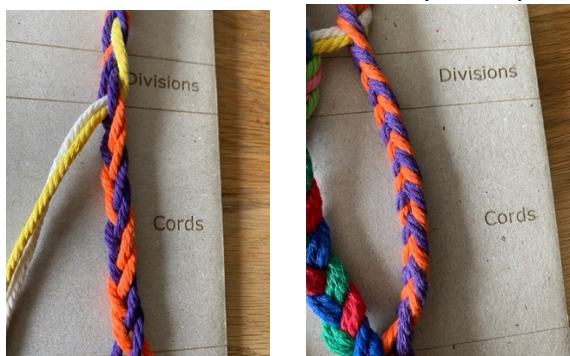
This is not an activity to teach someone about the brachial plexus. Consider it instead as an activity to embed the knowledge they already have or as a way to introduce aspects of anatomy to people who may know nothing about it but like crafting activities. In this scenario this can be taught as a decorative knotting exercise and the anatomy explained afterwards.

If you are engaging in this activity with students then double check what your text books says about the nerve routes within the brachial plexus as text books do vary and you want to be sure you are embedding knowledge and not adding confusion.

The nerves have been given two colours, this is to make identification of anterior and posterior cords and branches easier. The number of strands in each nerve are related to the number of branches fibres from that nerve will eventually appear in and says nothing about the nerve itself.

How to plait with 2,3,4,5,6 and 7 strands is covered in the appendix and it is worth practicing before attempting to construct the whole plexus.

Experiment with the order of your strands as it will change the appearance of your finished work. Below are two examples of the medial cord – the only difference being the order the coloured strands were in when they were plaited.



A set of instructions are available in the articles section of the web page www.anatomyfundamentals.com

This is a template of where the different coloured strands go for reference as you work



Constructions of the plexus

1 – tie and overhand knot in all of your nerves and slot them into the board in their correct place.

C5 – 2 dark green and 2 light green strands

C6 – 2 red and 2 pink strands

C7 – 2 dark blue and 1 light blue strand

C8 – 2 orange and 1 yellow strand

T1 – 2 purple and 1 white strand



2 – plait each nerve down to the first dividing line on the board. For C7-T1 this is a three strand plait and for C5 and C6 it is a four strand plait. C7 can be plaited all the way to the second dividing line

3 - For nerves C5 and C6 pair up the strings so that each green sting has a red or pink partner and then continue to braid as for 4 strands but now treating each pair of strings as a single strand. Continue this to the next dividing line



4 – Continue in this 8 strand plait until you reach the division section. At this point you need to separate out the lighter coloured string to make the posterior cord.

Bring in the C7 nerve strands and place the dark green, red and dark blue strands together.

Plait these as a double 3 strand plait until you reach the branches line.

At this point remove one of each colour strand and continue with the three remaining strands to form the musculocutaneous nerve. The remaining three strands should be towards the centre of the board.

5— Continue the work with C8 and T1 strands. Pair up the purple and white strands so they have a yellow or orange partner and continue to plait with double strands until you reach the divisions line.

At this point, set aside the yellow and white strands and continue with a 4 strand plait to make the medial cord. As you cross the line between branches and cords take a purple and orange strand out. Continue with one purple and orange strand to make the ulnar nerve. The two strand plait is essentially knotting and will hold everything above it in place.



6- work on the posterior cord. Join together the white and yellow strands and the remaining pink, light green and light blue strands. This is a 7 strand plait so three of the strings will be paired and 1 string will be on its own. Take note of the string that is on its own so that it does not suddenly become a pair as you work. It is best to take the yellow and white strands behind the others so that they are on the left hand side of the plait as this pulls all the strings together. Continue with the 7 strand plait until you reach the branches line. At this point a light green and pink strand need to come off and be plaited together to form the axillary nerve whilst the remaining 5 strands are plaited together to form the radial nerve.



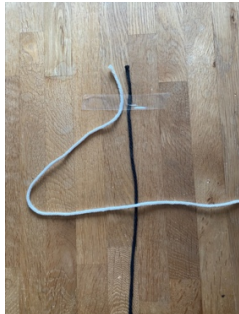
7 – the remaining strands, red, blue, green, purple and orange are brought together at the front and plaited to form the median nerve. You now have a finished plaited plexus.



Plaiting 2 strands

It's not really plaiting with 2 strands – its decorative knotting.

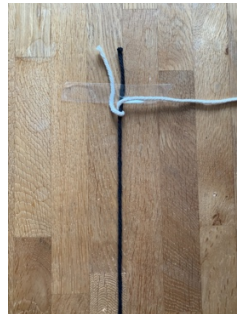
One of the strands will act as a standing strand around which we knot. This standing strand alternates after each knot to ensure we use the same amount of each colour string and so that the two colours are both seen in the strand.



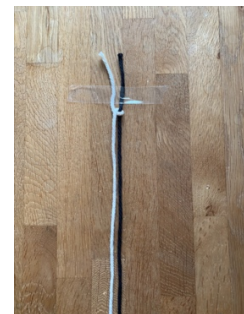
1 - In this case the black string is the standing strand. Place the white string over it.



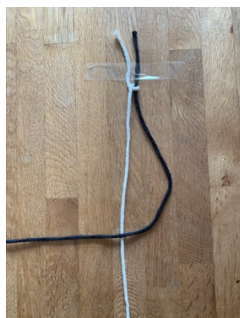
2 - Wrap the white string under the black string and pull it out to the side



3 - Slide the knot up to the top



4 - Place the white string beside the black one. The white string now becomes the standing strand



5 - Repeat the process on the other side – place the black string over the white.



6 - Pass the black string under the white and pull it out to the side



7 - Slide the black knot up to the top and then place the black string beside the white. The black string now becomes the standing strand and you repeat the process again



8 - Repeat this process for as long as necessary

Plaiting any number of strands becomes easy if you stick to a simple principle. Split the strings to be plaited unevenly between left and right hand sides. Take the outside string from the largest group and lift it across to the inside of the other group. Then take the outside string from this group and take it across to the inside of the first group. This method works for any number of strands.

Plaiting 3 strands (for 6 strands plait with pairs of strings)



1 - Split the strings into 2 on one side and one on the other.



2 -Take the outside string from the larger group (pink) and place it on the inside of the other group.



3 - Take the outside string from this second group (green) and place it on the inside of the other group



4 - Take the outside string from this group (purple) and place it on the inside of the other group



5 - Continue like this for as long as needed

Plaiting 4 strands (for 8 strands plait with pairs of strings)



1 - Split the strings 3 on one side and one on the other.



2 - Take the outside string from the larger group (orange) and move it across to the inside of the smaller group



3 - Take the outside string from the group you have just added to (green) and move it across to the inside of the other group.



4 - Take the outside string from the group you have just added to (pink) and move it across to the inside of the other group.



5 - Take the outside string from the group you have just added to (orange) and move it across to the inside of the other group.



6 - Continue like this for as long as needed.

Plaiting 5 strands



1 -Split the strings 3 on one side and two on the other.



2 -Take the outside string (orange) from the largest group across to the inside of the other group.



3 -Take the outside string from the largest group (red) across to the inside of the other group



4 -Take the outside string from the largest group (pink) across to the inside of the other group.



5 - Continue like this for as long as needed.

Plaiting 7 strands – when plaiting seven strings you can use the same method and treat them all as single strands but this creates large loops down the side of the work. A neater finish can be achieved if the seven strands are treated as three pairs and a single string and plaited as you would for 4 strings.



1 - Lie the strings out unevenly. In this case a pair on one side and two pairs and a single strand on the other side



2 - Take the outside pair from the group with most strings (purple and white) and move it across to the inside of the other group.



3 - Take the outside pair from the group you just added to (pink and orange) and move it across to the inside of the other group.



4 - Take the outside pair from the group with most strings (red) and move it across to the inside of the other group.



5 - Take the outside pair from this group (blue and white) and move it across to the inside of the other group.



6 - Take the outside pair from the group with most strings (purple and green) and move it across to the inside of the other group.



7 - Take the outside pair from this group (red) and move it across to the inside of the other group.



8 - Continue like this for as long as needed.

Don't worry about how uneven this looks – the single string makes it look worse than it is