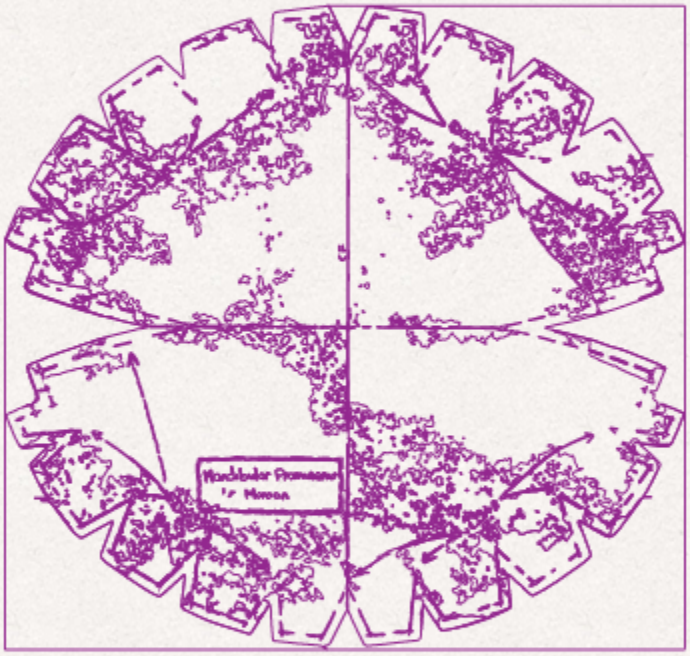
A Collection of Patterns for Fabric Anatomy Teaching Models



Created by Christine Jasoni, Latika Samalia and Fieke Neuman

Compiled by Sherri Melrose and Steve Swettenham

A Collection of Patterns for Fabric Anatomy Teaching Models

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Contents

Introduction

This creative commons collection is re-purposed content of the *Patterns for Fabric Anatomy Teaching Models* by Fieke Neuman, from the Anatomy Department (Otago School of Medical Sciences, University of Otago, Dunedin, New Zealand).

The purpose of this open educational resource (OER) compilation is to provide examples of how creative teachers have used everyday materials to develop hands-on teaching models for their students. Additional information about the *Patterns for Fabric Anatomy Teaching Models* is available at https://anatomy-teaching-models.wiki.otago.ac.nz.

This collection is open to creative commons contributions.

This project was funded by the Alberta Open Educational Resources (ABOER) Initiative; made possible through an investment from the Alberta, Canada government.

Patterns

1

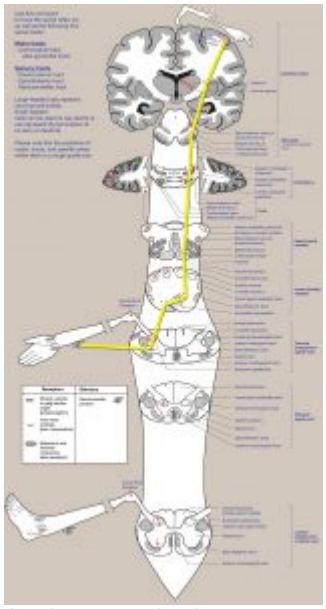
Axon Tracts in Spinal Cord String Art

Introduction

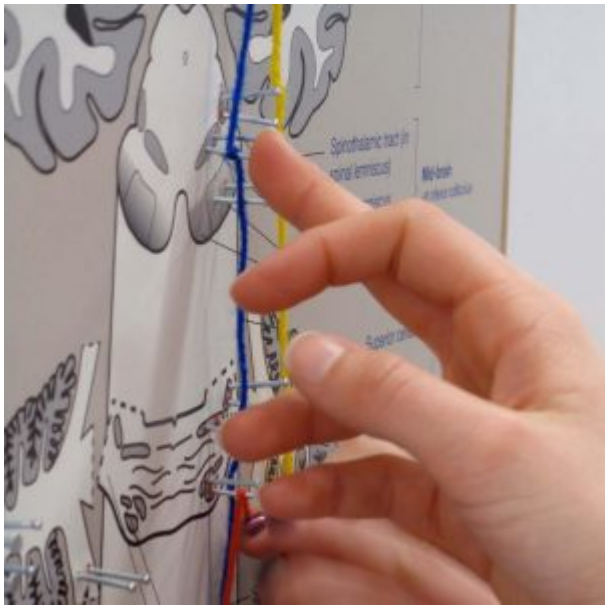
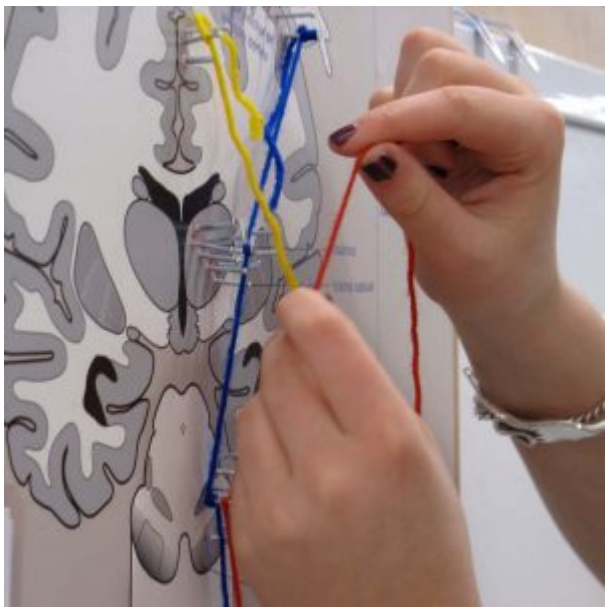
These string boards are based on classic 1970’s string art. Students use their hands and coloured wool to trace and learn several axon tracts:

- Spinal reflex arc
- Corticospinal tract (motor)
- Dorsal column tract (sensory)
- Spinothalamic tract (sensory)
- Spinocerebellar tract (sensory)

Model



final composite image


Construction

Stylised images of different levels of the brain and spinal cord (based on actual sections) were drawn out and the various tracts and nuclei marked out within them. The final composite image template (PDF 965KB) was printed out on adhesive plastic and stuck onto board. Nails were hammered in – large headed nails for cell bodies and finer nails for waypoints. A cheat sheet (PDF 102KB) was also produced to assist the students.

Attribution

String Art: Axon Tracts in the Spinal Cord

Dr Marilyn Duxson, Dr Ping Liu and Dr Brad Hurren (academic support), Fieke Neuman and Robbie McPhee (initial drawings and final artwork), Alex Witherow (wooden boards). Department of Anatomy, University of Otago.

6

Burlesque Brain

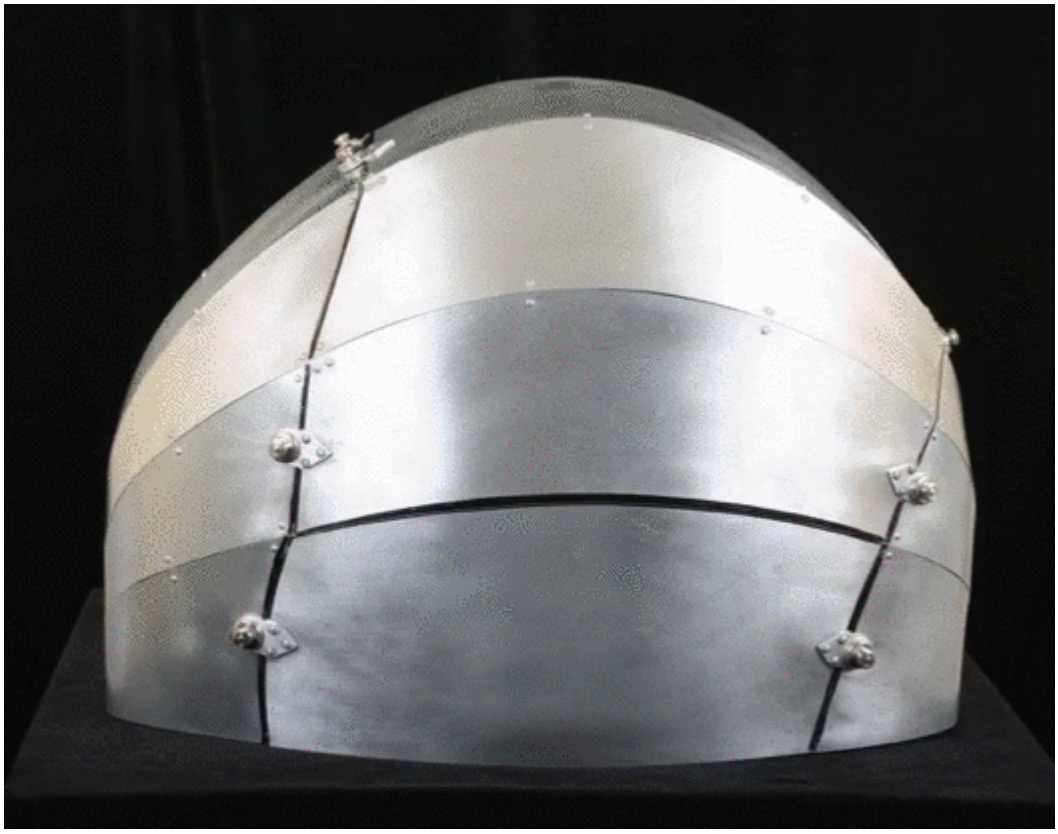
Introduction

A large model used to demonstrate the skull and meninges protecting the brain. The materials used are tactile and each is a metaphor for the function of a particular layer

- Skull – several hard plates that interlock
- Dura mater – tough and flexible
- Arachnoid mater – complex web-work with large blood vessels
- Pia mater – delicate and fitting close to the brain

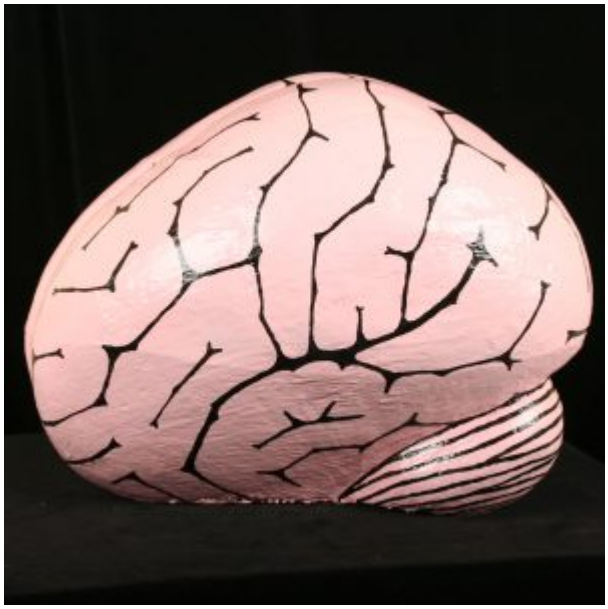
Model


Dr Jasoni demonstrating the Burlesque Brain

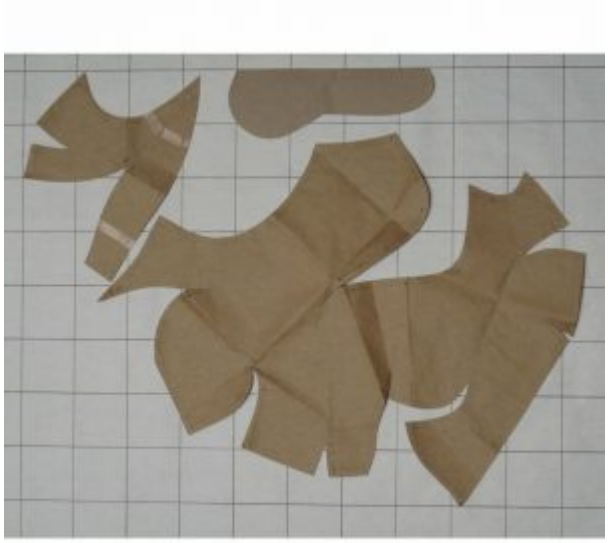


Construction

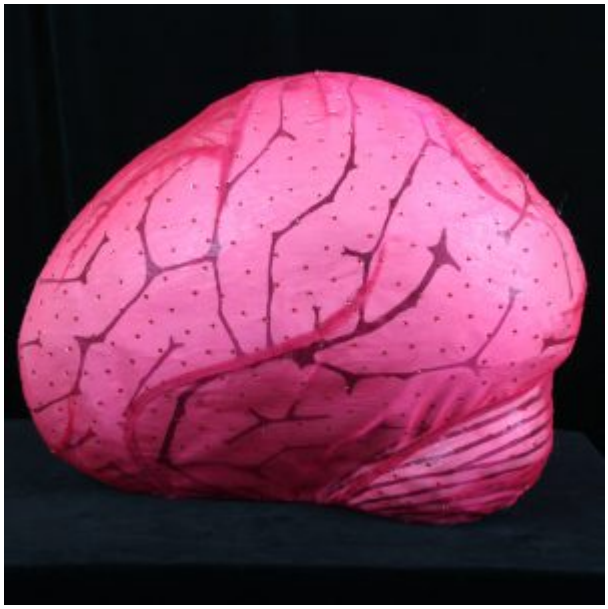
This model was made as a one-off from the inside out. The very simple brain shape was carved from a large block of expanding foam, covered with a resin shell, painted and sealed.



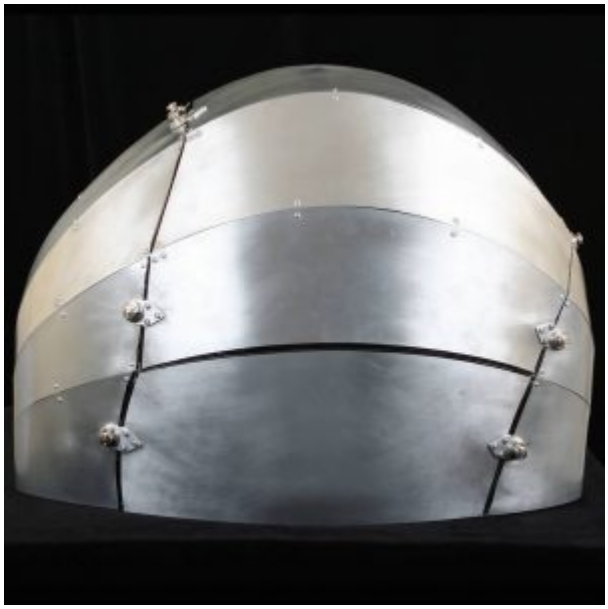
The pattern pieces for the fabric layers were made by wrapping the brain model with paper and then cutting that paper along lines that resembled sulci until the pattern lay flat. The following images are of tidy reproductions of the original patterns. The Pia pattern was made first and the arachnoid/dura pattern graded up from that. Background grid is 100mm x 100mm.

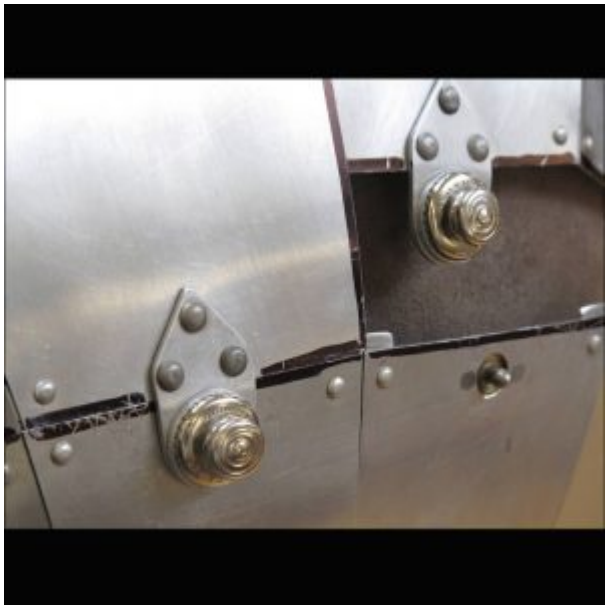


Materials: pink organza fabric (Pia), black devoré fabric and dacron with red trim (Arachnoid) and heavy beige suede-like fabric (Dura). Zips were inserted along the mid-line.



The aluminum skull plates with clips were designed and produced by a specialist engineer.





For ease of transport and for maximum unveiling effect a padded carry case was produced to fit the completed model.

Attribution

Burlesque Brain

Dr Christine Jasoni (initial idea and academic support), Fieke Neuman (sculpting, painting, patterns and sewing), Shane Soal (expanding foam, resin, painting), Howard Haugh (design and construction of the aluminium components), Alex Witherow (wooden base of carry case). Department of Anatomy, University of Otago, except for Mr Haugh.

11

Developing Face

Introduction

A soft material of the development of the human face at about week 8 when the palatine shelves of the maxillary prominences join to form the palate.

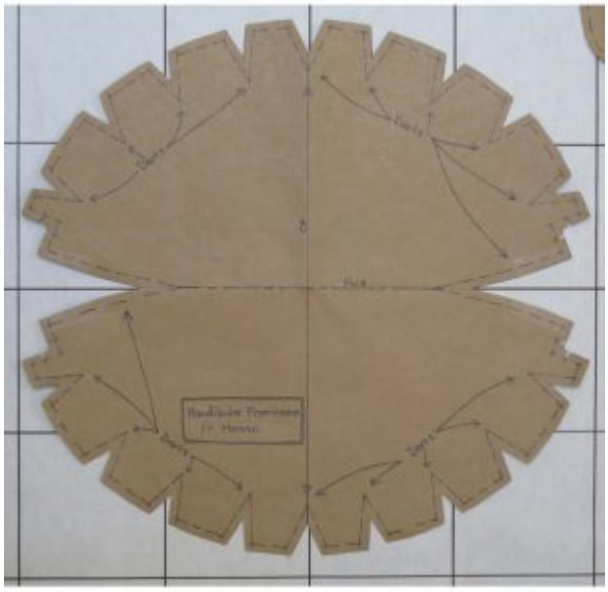
Model

Construction

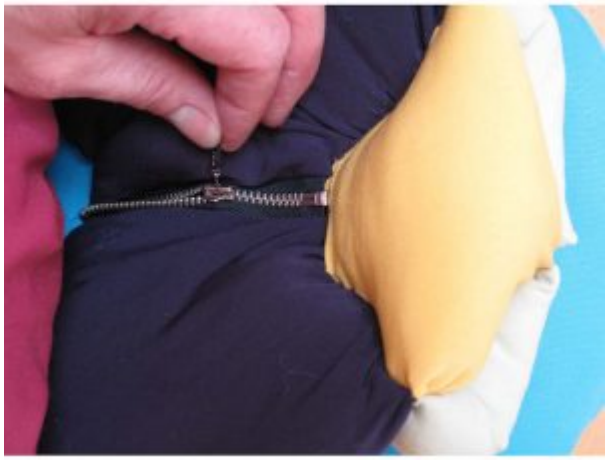
The fabric used was stretch fabric. In the following photos of the pattern pieces the background grid is 100mm x 100mm. Matching colours derived from http://www.indiana.edu/~anat550/hnanim/face/face.html.

Frontonasal prominence – teal blue:

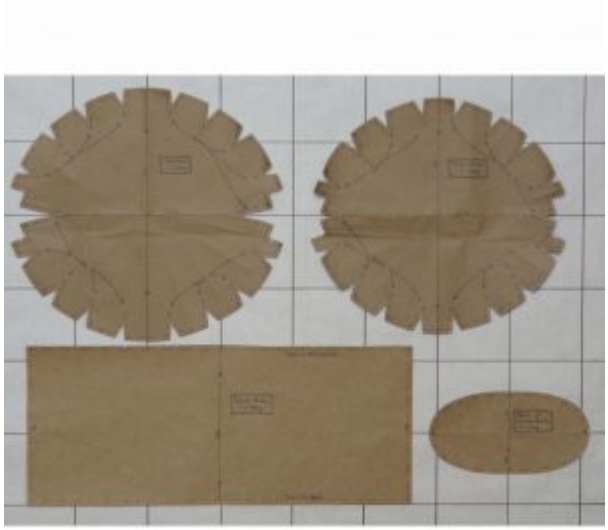
Mandibular prominence (lower part of pharyngeal arch 1) – maroon:



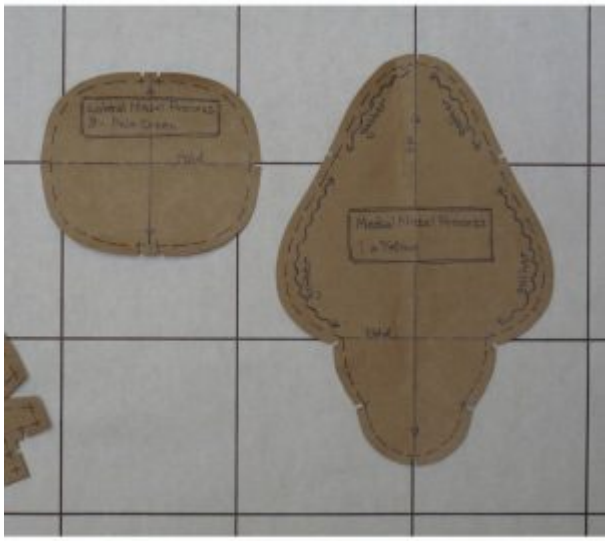
Maxillary prominences (upper part of pharyngeal arch 1) – purple. A short open-ended zip is incorporated between the two prominences:



Other arches – grey:



Medial nasal process – yellow and Lateral nasal processes – pale green:



Once sewn up the pieces were filled with dacron and hand sewn together.

The eyes are made of ping pong balls covered with white knit fabric:

Attribution

Developing Face

Dr Christine Jasoni (initial idea and academic support), Fieke Neuman (patterns, sewing). Department of Anatomy, University of Otago.

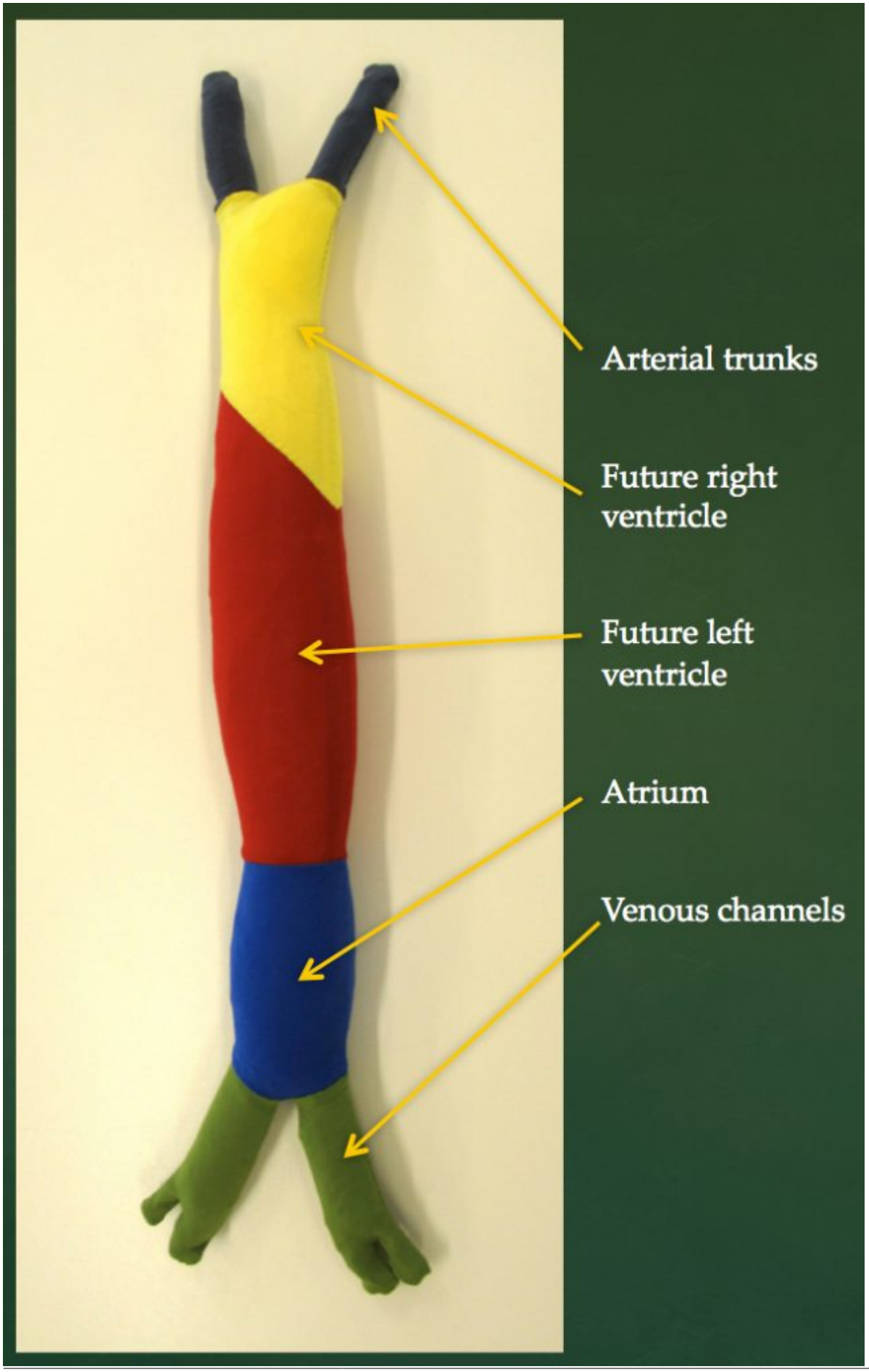
16

Developing Heart

Introduction

A flexible model to demonstrate the early development of the heart.

Model


Arterial trunks
Future right ventricle
Future left ventricle
Atrium
Venous channels

Construction

Made from several colours of knit fabric. The background grid in the pattern photo is 100mm x 100mm. Also prepare two long, oversized plastic bags. These should be able to be well sealed once filled. Double-bagging is a good idea.

The flexible filling is “Floam”. Floam is made from “Slime”, with added grated polystyrene. Slime recipes are readily available on the internet on kids make-it sites e.g. http://chemistry.about.com/cs/howtos/ht/slime.htm. For this model we used the following recipe:

> Make a 6 – 8% solution of Polyvinyl Alcohol (e.g. Sigma P8136, average molecular weight 30,000 to 70,000, H2O soluble) – tapwater fine, takes a while to dissolve (at least overnight) and can be sped up with a little heat
> Make a similar volume of a 2 – 4% solution of Sodium tetraborate decahydrate – warm tapwater works well
> Stir the PVA slowly into the borax – a clear gel (Slime) will polymerise
> Pour off any excess water and knead the slime into a blob
> Prepare a similar volume of small polystyrene balls (working inside a big plastic bag, grate a polystyrene container into small pieces) and knead into the slime – this is now Floam

Once the Floam is inside the sealed bag it will keep fairly well but may dry up over a few years and need to be replaced.

Attribution

Developing Heart

Dr Christine Jasoni (initial idea and academic support), Fieke Neuman (patterns, sewing, floam). Department of Anatomy, University of Otago.

21

Gut Tube

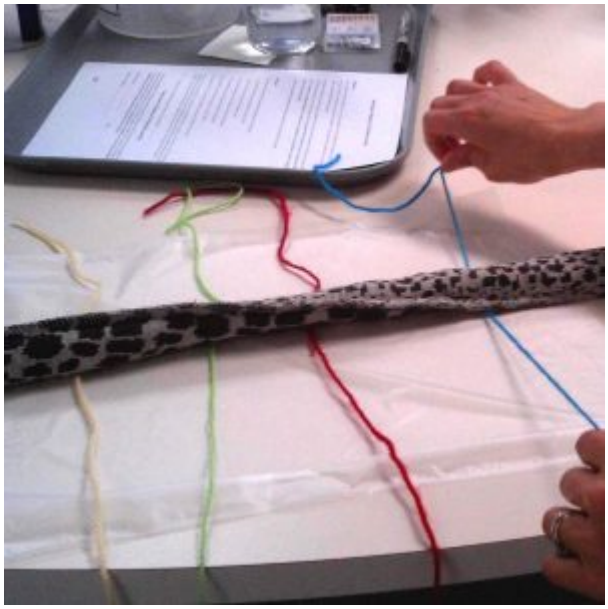
Introduction

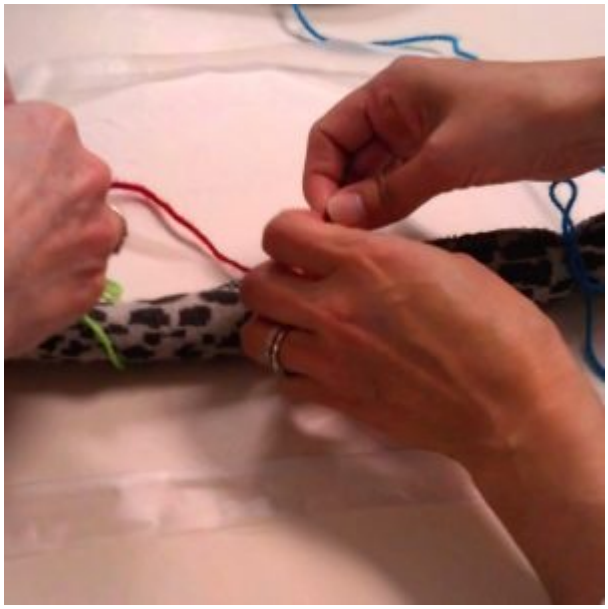
Simple rectangle of fun fur becomes a gut tube for first year health science students to understand how peristalsis can move food (marbles) from one end to the other. Plastic film and coloured wool simulate the gut mesentry containing blood vessels and nerves.

Model

Construction

Long rectangles (80mm x700mm) were cut from artificial fur fabric. The two long edges were sewn together and overlocked, with the fur on the inside. The ends were left open so that marbles could be introduced. Plastic cling wrap was used to simulate the gut mesentry, with coloured yarn to simulate arteries, veins, lymphatics and nerves within the mesentry.





Attribution

Gut Tube

Dr Ruth Napper, Dr Rebecca Bird and Fieke Neuman. Department of Anatomy, University of Otago.

26

Peritoneum in a Box

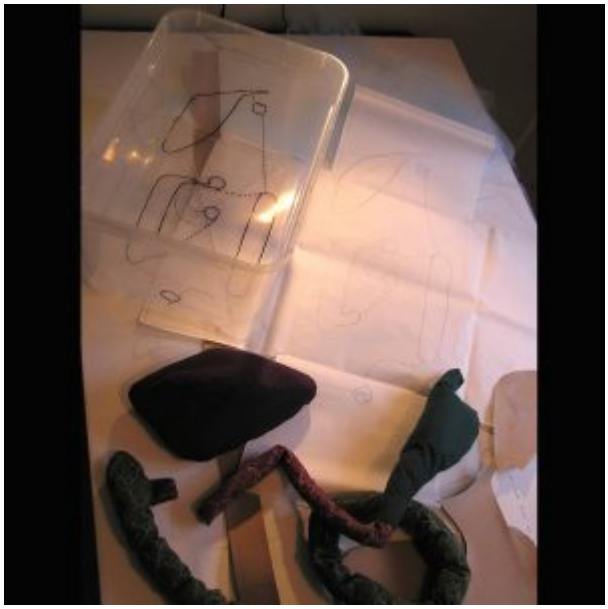
Introduction

The layers of the abdominal peritoneum.

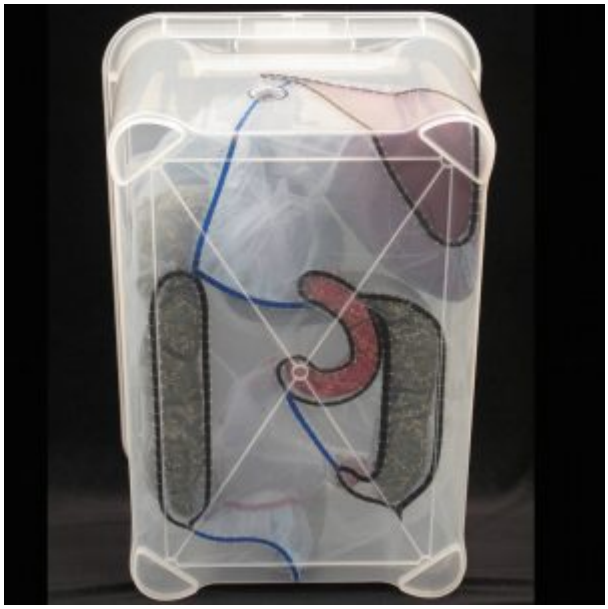
Model

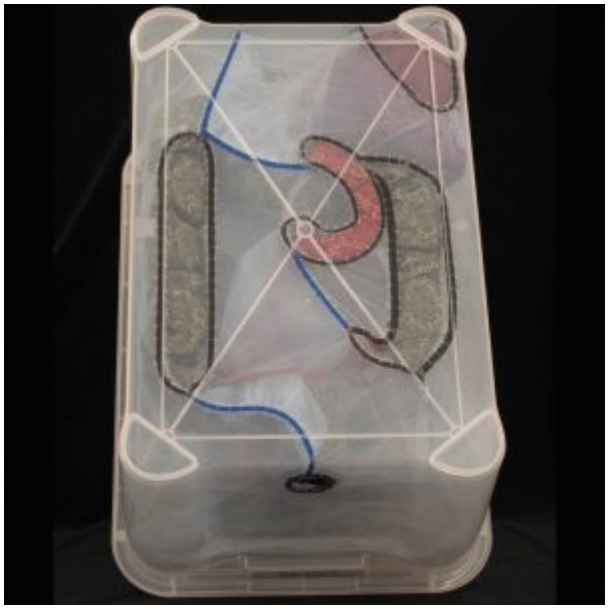
Construction

This model started with a suitable sized plastic box and lid, representing the abdominal cavity. The bare areas and attachment sites of the peritoneum were marked with electrical tape and patterns were made for sections of the parietal peritoneum.




Fabric models of the liver, stomach, initial section of duodenum, final section of small intestine and large intestine were made and stuffed with dacron. Patterns were made for the visceral peritoneum covering these organs and also the loose sections: greater and lesser omentum, small intestine mesentry (partial), mesocolon. All the peritoneal pieces were made from fine bridal netting. A zip was included so that the parietal peritoneum could be completely closed. Once all the pieces were sewn up they were attached along the lines in the box with fishing line.



Attribution

Peritoneum in a Box

Dr Latika Samalia (initial idea and academic support), Fieke Neuman (patterns and sewing), Marcus Collinge (plastic cutting, tape lines). Department of Anatomy, University of Otago.