

Flipped Classroom

Subcutaneous Injection



Disclaimer

A series of booklets (instructions for skills and flipped classroom materials) has been developed by the Clinical Skills Lab team (staff, recent graduates and students) from Bristol Veterinary School, University of Bristol, UK.

Please note:

- Each flipped classroom booklet includes ways to prepare for learning a skill in class; it is acknowledged that there are often other approaches. Before using the booklets, students should check with their university or college to determine whether the approaches illustrated are acceptable in their context or whether an alternative resources should be used.
- The booklets are made available in good faith and may be subject to changes.
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Introduction

This flipped classroom is designed to be used as preparation for practical classes that involve learning to use a syringe and needle, draw up medication and administer a subcutaneous injection.

This booklet has the following sections:

1. Learning outcomes
2. Content (a selection of learning resources)
3. MCQs (a self-assessment quiz)
4. Notes and other useful learning resources

1. Learning Outcomes

- Use needles safely
- Draw up medication
- Administer a subcutaneous injection

N.B. The focus of the flipped classroom is on underpinning knowledge and 'knowing how' to do the skills, which will ensure you can get the most out of the time spent in the practical class. The flipped classroom also includes an activity where you can practise some aspects of the skill using a pen and towel.



2A: Assembling the syringe and needle

Steps and considerations:

- Select an appropriate size needle & syringe
 - Tip: Use the smallest size needle possible but if the medication is thick e.g. in an oily base, then a larger size may be required.
- Peel open the sterile packets taking care to maintain sterility.
 - Do not touch the hub of the needle or the tip of the syringe.



Reading a syringe:

- It is important to read a syringe accurately to ensure the correct dose is administered. Familiarise yourself with the syringe you will be using before drawing up the medication.
- Syringes may differ dependent on size and gradation e.g. lines at intervals of 0.1mls or 0.2mls, etc.
- See more details on **how to read syringes** in the video:
<https://www.youtube.com/watch?v=b4Y2qE4ZgvE&t=466s>



2B: Drawing up medication

To familiarise yourself with the steps (*described on this page & the next*) :

1. Read the text which describes the steps
2. Watch the video
3. Try remembering the steps *e.g. write the steps down or describe the steps to someone else*

Steps and considerations:

- With multi-use bottles such as antibiotics it is good practice to use a surgical spirit (alcohol) swab to wipe the rubber septum (at the top of the bottle) and allow several seconds to dry. However, alcohol swabs should not be used with certain bottles e.g. containing vaccines or insulin, as these can be adversely affected by the surgical spirit.
- Uncap the needle. TAKE CARE to remove the cap pointing away from yourself.
- Pick up the bottle (*in CSL practicals it will be 'water for injection'*) in your non-dominant hand with fingers positioned as shown in the photo. Hold the bottle at a slight angle.
- Insert the needle into the bottle through the rubber septum and withdraw a little more liquid than required. Inject the extra amount of liquid back into the bottle with any obvious air until only the required amount remains in the syringe - *in the photo it is 0.5mls*





2B: Drawing up medication

To familiarise yourself with the steps (*described on this page & the next*) :

1. Read the text which describes the steps
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Steps and considerations:

- **If there are still air bubbles** in the syringe, tap/flick the barrel of the syringe to move the air to the top, draw back a little more liquid and then inject the air and extra liquid back into the bottle. Use the little finger of your non-dominant hand to secure the syringe as you tap/flick (see photo).
- If there are still air bubbles in the syringe, try removing the needle from the bottle, draw up a little more air, flick the syringe to move all the air bubbles to the top and press on the plunger to expel the air (see photo). It is important when doing this to hold the syringe with the needle pointing directly upwards, so the air bubbles rise to the top.
- Remember to check that the amount of medication in the syringe is correct.
- To watch a **video** showing these steps click on the image or click on the following link:
<https://youtu.be/2Q-MAv0IQpM>





2C: Administering a subcutaneous injection

Read the text below which describes the steps and then try remembering the steps *e.g. write the steps down or describe the steps to someone else*

Steps and considerations:

- With your non-dominant hand, **make a skin tent** in the scruff of the neck by grasping the skin between your fingers and thumb. The grip should be firm but not too tight (which could be painful).



- **Insert the needle** at approximately a 45 degree angle to the skin surface, the needle should be inserted up to the hub. The needle bevel should be pointing upwards.
- When the needle is through the skin, pull the plunger back a little to check there isn't a 'flash' of blood i.e. the needle is in a blood vessel, in which case just withdraw the needle and start again. When pulling back on the plunger you should feel slight resistance. If you draw back air, the needle may have gone through and out the other side of the skin tent (reposition and/or remove the needle and start again).
- **To inject:** gently press the plunger until the dose is administered. Withdraw the needle and syringe and gently rub the injected area.



2D: Disposing of needles and syringes safely

NOTE: It is important to dispose of sharps (the needle) and clinical waste (the syringe) safely.

Steps and considerations

- In most situations, dispose of the needle directly into a sharps container.



- The syringe is typically then put into a clinical waste bin.
- In some situations, the needle and syringe are disposed of together i.e. both are placed into the sharps container.

NOTE:

- Occasionally, it may not be possible to immediately dispose of the needle in a sharps container e.g. when cow- or horse-side. Then re-cap the needle using the one handed capping technique which will reduce the chance of needle stick injuries. See [CSL L02 Safe Use of Needles Booklet](#) (steps 13-17).

- To view a **video** showing the one-handed capping technique please click on the image or the following link: <https://youtu.be/AYUbpBLceTg>





Flipped Classroom Content

Subcutaneous Injection

2E: Try practising at home using a pen and towel

Equipment you will need:

- Biro with lid
- Close-knit sweater or towel



Steps to practise

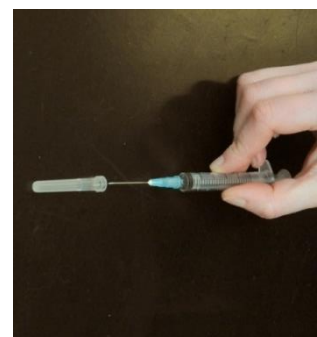
Step 1: Uncapping a 'needle safely': Hold the biro as you would a syringe and practice removing the lid as if it were the cap on a needle. Hold the biro still and remove the lid away from you to prevent needle stick injuries.



Step 2: Practise making a skin tent in the close-knit sweater and holding the uncapped biro at approximately a 45 degree angle to the 'skin' surface.



Step 3: Although the needle is normally disposed of in a sharps container, occasionally the needle is re-capped. Practise re-capping the biro using the one handed capping technique.



The image shows a syringe and needle, but you can practise with the biro and its lid on a table.



3. MCQs

Test yourself using the MCQs in this quiz:



https://xerte.bris.ac.uk/play.php?template_id=5244



4. Notes and other useful resources

There are **clinical skills instruction booklets** relevant to injection techniques and the related practicals on the website:

<http://www.bristol.ac.uk/vet-school/research/comparative-clinical/veterinary-education/clinical-skills-booklets/>

Relevant booklets include:

- CSL_D10 Making a Skin Tent
- CSL_D11 Administering Subcutaneous Injection
- CSL_U02 Safe Use of Needles

Additional useful resources:

- Video on reading syringes:

<https://www.youtube.com/watch?v=b4Y2qE4ZgvE&t=466s>