

General guidance and teaching with a microscope

Whilst many making reference to this guide will be seasoned clinical demonstrators, it is worth highlighting a number of important points about the delivery of clinical skills teaching.

- When there are a number of teeth to work on during the session, do not provide the students with a full list at the start. Split the session up and control the activities that are being carried out at any one time.
- It is helpful for all to try and provide the students with an overview about how the session will be delivered. 3 hours can be a long time without a break, especially if the students cannot identify their progression through the session. Use plenty of signposting and interrupt practical elements with episodes of peer review.

MICROSCOPE USE

The use of real-time video through microscopes for teaching operative skills is well documented. It is also recognised that the way in which the microscope is used can impact both positively and negatively on the learning experience. Microscopy should not be used in isolation; it should form part of a well-planned pedagogical approach involving a number of learning styles. It is important for the educator to be aware of where the students might be within the current learning cycle in order that the usefulness of the episode is optimised.

I would make 5 recommendations for educators using microscopes to demonstrate operative clinical procedures, using my PeNDVER approach:

1. Pre-emptive

It is imperative that the episode is planned. However it is equally as important that steps within the demonstration are verbally introduced prior to being implemented practically. There seems to be a natural 'lag time' between the narrative and the ability of the students to pay attention and understand what is about to be shown.

2. Narrative

And thus, a careful narrative becomes the key to a successful demonstration. Time should be built in to allow adequate and clear explanation of the technical stages before they are carried out. Remember that often this is the first time that the students will have seen a procedure. Give them plenty of notice and guidance about what to watch and where. Lengthy stages should have the narrative reinforced a number of times.

3. Definite

Many educators utilise instruments and models to gesture in order to complement the narrative. This should be avoided whilst using the microscope. In such a small field of view, this can be distracting. Any actions carried out under the microscope should be *definite and precise*; otherwise the students fail to pay attention at critical moments. Movements should, where possible, be exaggerated with an accompanying narrative.

4. Visible

Whilst most teachers have an excellent degree of operative skill, and a well-thought out narrative, the episode can fail miserably if the students cannot see effectively what is being demonstrated. Overcoming this takes a reasonable amount of practice – and is helped significantly if the teacher has an output monitor or one of the teaching screens within their field of view. Often it means demonstrating a procedure from an angle that is alien to the teacher. Perspective is important, and when using burs and hand instruments the teacher should ensure that the active component of the instrument is visible wherever possible at all times. It may also be necessary to change the angle of view and repeat the action again. The field of view is also very important, and it is easy to let the object of interest fall out of focus.

5. Errors

Whilst it is expected that demonstrations under the microscope should be flawless, there are occasions where it is *more* useful to demonstrate a mistake or a common problem. In the end we would like our students to be able to negotiate their own way to a clinical endpoint rather than rote learn or copy a practical procedure. In this way, the students are drawn towards common pitfalls or misconceptions, and they are left to deduce the appropriate way forwards. In my experience this works extremely well, and it is staggering how the students can develop competence in something that they haven't witnessed in its entirety; tacit learning is important, and consider saving more comprehensive teaching for those that struggle after the first couple of attempts. Our students are, on the whole, intelligent individuals who can synthesize diverse (and often what may seem like counterintuitive) information.

6. Repeated

Finally, I would encourage the demonstrator to repeat individual stages as many times as possible during the narrative, to reinforce the procedure. This may, as mentioned above, involve a subtle change in angulation or approach – it may even have to be truly simulated in that a surface may already have been cut, shaped or carved – but whilst the narrative is repeated, the instrument should ideally also be working through the procedure to reinforce their mode of use.