

# A New Modern Model for Teaching Intravenous Fluid Prescribing in an Undergraduate Curriculum

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## INTRODUCTION

The prescription of intravenous fluids is a common procedure undertaken by junior medical staff (1). Foundation year doctors have been shown to struggle with the composition of the Fluids, and the patients themselves (2). The reasons for this are multifactorial, but often there are discrepancies between textbooks as to practices and principles (3)

Guidance from large communities such as GIFTASUP and NICE have made movements to standardise practices (2,4) Lecture based teaching in Prescribing practice quotes as helpful for baseline understanding, but lacking the authenticity students need to feel they can take responsibility for it (5)

## ORIGINAL TEACHING

Prior to this development, much of intravenous fluids teaching was experiential on ward placements, in small group sessions planned in year 5 and supplemented by a single lecture by our biochemistry team given in year 4.

New local guidelines are due to be released within the NHS deanery. With the co-ordination and coalition of active frontline NHS staff we aligned this, and the national NICE, and international GIFTASUP (6) guidance to blueprint a multi-academic level syllabus to tie traditional systems teaching to more modern online medium to demonstrative practical principles beyond lectures or experience.

## CPD REQUIREMENTS

Using the GMC guidance on CPD as a “learning outside [...] training that helps maintain and improve performance” (7) we arranged a sessions to present the updates to local guidance and blueprinted to undergrad teaching to consultants across specialities. Given the multi-speciality team, it allowed for further opportunities to standardise locally, and discuss individual service needs. This worked into both advertising the local guidance and standardisation in the eventual ward based/experiential teaching.

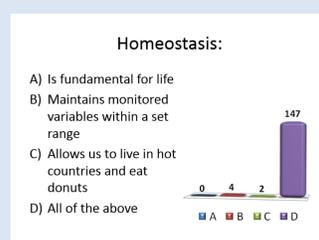
All physicians were able to use this as evidence in annual appraisal, and to identify their own ongoing CPD needs. This was the cornerstone of how professionals could also benefit from participation.

## Years 1 and 2

Mobile Learning was used (OMBEA system) in year 1 Homeostasis lectures to engage students, and had become ubiquitous within the student cohort prior to this initiative. M-learning has been shown to be more engaging to students, though like most online mediums improvements in outcomes has limited data thus far (8).



Figure 1. QR Link to Slides Excerpt



There were limited timetabling opportunities for IV fluid specific teaching in Year 2, but improved signposting in surgical and Renal lectures and workshops were arranged, and advice given in line with subsequent lectures.

The focus of our early interventions in the MBCHB were aimed to improve the *knowledge* base (per Bloom's taxonomy (9)) required to allow the subsequent years to move to metacognition in a contextual, but clearly standardised environment.

## Year 3

Using a slide-set based on NICE guidelines and cross-referenced with GIFTASUP, a pilot lecture was trialled and feedback sought from students (with poor uptake).

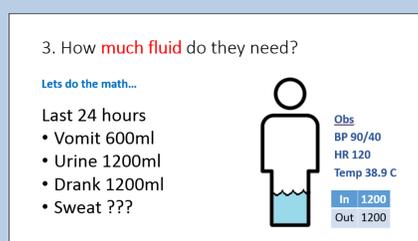


Figure 1. QR Link to Slides Draft

Using an interactive lecture method allows for conversion of the knowledge gained (and refreshed ) to help consider the practical application of knowledge. The results are class-summarised, and as such it removes the possible “embarrassment” of not getting the question right compared to peers – allowing a safe and engaging formative learning environment.

The core physiology was converted into a Video in order to allow for a **flipped classroom** model. Having a set video meant that what was being taught was more engaging, universal and equal.



Figure 2. QR Link to Video Draft

## Years 4 and 5

Using time already available in Pre-professional Practice blocks we arranged a representative from each clinical area and collated vignettes of clinical cases based on real clinical practice. These were reviewed and edited by all disciplines for inaccuracies and continuity.

They were then allocated to be appropriate for a short case (becoming a “ward round” assessment in Year 4) or long case (independent prescribing case for year 5) based on complexity. With help from local IT teams, we created specific VLEs for both years.



Figure 3. QR Link to Year 4 VLE Draft



The design of these cases was to assess the students contextual application of theories learned, and latterly using case-based discussions to demonstrate metacognition and clinical reasoning behind prescriptions. Using an “unfolding real scenario” aimed to improve the fidelity of what inherently is a fairly artificial situation

## DISCUSSION

We have converted traditionally practical, yet variable teaching into an easily updatable and modern format. Using set guidelines, both students and staff gain experience and clarity that they can utilise in their respective departments. This could help with the disparity seen by students in all mediums of teaching thus far. Layered by years using Bloom's Taxonomy as a guide (9).

The issue of a “digital divide” may alienate those from a widening access background, though IT facilities are ubiquitous in modern universities. Setting up such exercises, particularly videos, is front end intensive – though offset as a medium that can be more easily and quickly updated versus traditional textbook mediums. As yet however, there is limited evidence that specifically in intravenous fluid prescription virtual learning events are sufficient or better in end outcomes for prescribing.

## CONCLUSION

We reviewed the issues with discrepancies in educational opportunities and textbooks, and made a modern and engaging lesson set to address the difficulties faced by students in understanding fluid therapy.

Our hope is to assess improvement in end outcomes and knowledge testing, and to incorporate the final blueprinting into a rubric for summative assessment.

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