

## Supplemental Material

### Medical Students' Views about Interprofessional Clinical Skills Sessions for Delivering Interprofessional Education

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#### Box 1: Themes for each of the 6 stations for the ICS sessions

Station	Pharmacy & Medical students	Paramedic & Medical students *	Nursing & Medical students
1	Drug history and medication review: Patient admitted (i) following a fall, (ii) with confusion	Communication skills: Admission of confused elderly lady	Information gathering: social history
2	Acutely unwell patient: Opiate overdose. GI bleed on warfarin	Patient with atrial fibrillation and chest infection	Telephone communication skills - escalation
3	Drug chart errors	Telephone consultation, confidentiality and consent	Respiratory assessment and management of IECOPD
4	Data interpretation	Patient with GI bleed	Insulin and fluid prescribing and administration (cannulation station)
5	Acutely unwell patient: Pneumonia and fast atrial fibrillation. Fast atrial fibrillation and congestive cardiac failure	Medical emergencies in the community	Data interpretation: waterlow, BMI, ABPI, MUST, EWS, urinalysis
6	Bag of drugs - medication review and optimisation	Major incident: train crash	Manual handling

\* Further details available in Nagraj et al 2018

Key:

ABPI = Ankle-brachial pressure index

BMI = Body mass index

EWS = Early warning score

GI = Gastrointestinal

IECOPD = Infective exacerbation of chronic obstructive pulmonary disease

MUST = Malnutrition universal screening tool

**Box 2: Interprofessional Clinical Skills (ICS) session questions included in the 2013-14 to 2016-17 Year 4 and 5 Annual Evaluations.**

**The following questions are about the Year 4 IPL joint teaching exercise where you were partnered with pharmacy students to solve prescribing and therapeutics scenarios. (2013-14 evaluation only: instructions for Year 4)**

**The following questions are about the Year 5 IPL joint teaching exercise where you were partnered with nursing students to solve clinical skills scenarios. (2013-14 evaluation only: instructions for Year 5)**

Please rate your level of agreement with the following statements: (1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree)

1) This exercise enabled me to learn about my own and others' respective professional roles and responsibilities: (2013-14 evaluation only: asked in both Years 4 & 5)

2) This exercise helped me develop my own interprofessional teamworking skills: (2013-14 evaluation only: asked in both Years 4 & 5)

3a) The exercise was an effective way of learning about how these two professions complement each other's skills in prescribing and therapeutics specifically: (2013-14 evaluation only: asked in Year 4)

3b) The exercise was an effective way of learning about how these two professions complement each other's skills with respect to clinical skills specifically: (2013-14 evaluation only: asked in Year 5)

4a) This exercise was an effective way of learning about prescribing and therapeutics: (2013-14 evaluation only: asked in Year 4)

4b) This exercise was an effective way of learning about clinical skills: (2013-14 evaluation only: asked in Year 5)

5a) Please rate your overall satisfaction with the joint learning exercise (Interprofessional Clinical Skills) where you were partnered with pharmacy students to solve prescribing and therapeutics scenarios. \* (All evaluation years: asked in Year 4)

5b) Please rate your overall satisfaction with the joint learning exercise (Interprofessional Clinical Skills), where you were partnered with nursing students to solve clinical skills scenarios. (All evaluation years: asked in Year 5)

Question 5 rated on the following scale: 1 = Not at all satisfied, 2 = Slightly satisfied, 3 = Moderately satisfied, 4 = Very satisfied, 5 = Completely satisfied.

6) What aspect/s of this joint learning exercise (Interprofessional Clinical Skills) were most useful for your learning needs, and why? (All evaluation years: asked in Years 4 and 5)

7) What, if any, improvements would you suggest for this joint learning exercise (Interprofessional Clinical Skills) for the future? (All evaluation years: asked in Years 4 and 5)

\* Following the introduction of paramedic students this satisfaction question was revised as follows "Please rate your overall satisfaction with the joint learning exercise (Interprofessional Clinical Skills) where you were partnered with other health professional students (e.g. pharmacy, paramedic students).".

NB The Interprofessional Clinical Skills (ICS) sessions were initially referred to as an 'IPL joint teaching exercise' on the students' timetables, so they were described as such in the evaluation questions for the first academic year of this study. In later years the activity was referred to as an "Interprofessional Clinical Skills joint learning exercise" and so the evaluation questions were revised accordingly to match how the students would be familiar with this IPL opportunity.

**Box 3: Illustrative quotes from the open-ended question “What aspect/s of this joint learning exercise were most useful for your learning needs, and why?”**

“I was very sceptical beforehand, thinking the exercise would be a waste of an afternoon. However I was very surprised to find myself actually enjoying the experience. Having pressure put upon us to use the BNFs to quickly prescribe is really good practice for our upcoming electives, shadowing and subsequent working lives as junior doctors.” [2013-14, 20, Male, Year 4]

“It was a good indicator to see what our strengths and weaknesses were by being thrown in to different scenarios. Was a relaxed but useful session to learn, great working with another member of the team with guidance from experienced tutors.” [2016-17, 22, Female, Year 5]

“Useful to learn what important skills are needed to work with others and also see what other colleagues can bring to the overall management of a patient.” [2016-17, 18, Female, Year 5]

“Good to see what it would be like working in a team in real life scenarios in the future.” [2014-15, 22, Female, Year 4]

“Each station required you to either take a leadership role or a supporting role - this was useful to remind you of your role but also the role of others.” [2013-14, 19, Female, Year 4]

“Fantastic team working, able to compliment each others skills and knowledge. It made it very clear that we all have areas that we are good at and need help for others. Good for the nursing students to see how much they know and that they have a skill base that we don't have - this was the perception my nursing colleague gave me.” [2016-17, Not provided, Not provided, Year 5]

“I did not realise how much we knew until I was paired with a nurse for the session, and likewise I was not aware of a nurses knowledge and expertise in many crucial areas of patient care. It was a great eye opener on how both professions complement each other and should work together to achieve the best patient care.” [2015-16, 18, Female, Year 4]

“Was a fun and interactive exercise that helped me to appreciate the vast knowledge of the pharmacists. I was very impressed by my partner and would definitely seek a pharmacists help in the future.” [2014-15, 19, Female, Year 4]

“Really interesting to work with other professions closely - it helped to identify the boundaries of my knowledge, and what I need help with from other professionals - I felt it was an invaluable experience.” [2015-16, 19, Male, Year 4]

“Practice at fulfilling my soon to be professional role in the team (i.e. rather than just being the student) and gaining confidence of asking things of people in their areas of expertise. Also gaining more knowledge of who is trained up to do what in the MDT.” [2016-17, 22, Male, Year 5]

“Working in a team, problem solving together, seeing how brilliant the pharmacists are.” [2015-16, 18, Male, Year 4]

“Working as a multidisciplinary team, integrating our different skillsets and optimizing communication between different members of the team.” [2016-17, 22, Female, Year 5]

“Really good experience learning when to take the lead and when to step back was useful.” [2015-16, 18, Female, Year 5]

“Very useful to have a chance to practice simman under non OSCE conditions and receive feedback.” [2014-15, 18, Female, Year 4]

“Good practice of acute situations and SBAR + simman skills.” [2016-17, 19, Male, Year 5]

“It was really good doing a simman situation and everybody showing what they would do in the scenario. Also the SBARD situation was really useful too.” [2016-17, 19, Female, Year 5]

“It was a great opportunity to run through scenarios as an OSCE but in a more relaxed manner and the verbal feedback afterwards has been very useful with regards to highlighting areas in which I need to work on in the future and well as learning what my strengths were. I found the experience quite a confidence boost as, with the help of the paramedic student, we were able to problem solve and work through scenarios as will be required in the hospital in a few years. I also found it a good way to interact with a student from a different course, and as each of us led different scenarios, it didn't feel like one of us was superior to the other.” [2015-16, 18, Female, Year 4]

*Key: [Year of study, Participant identification number, Gender, Year group]*

*NB Unedited/uncorrected comments provided by the students in response to the open ended question.*

**Box 4: Illustrative quotes from the open-ended question “What, if any, improvements would you suggest for this joint learning exercise for the future?”**

“In the IPL OSCE I didn't feel like the students of the other health care professions were always that engaged/interested ... Obviously this is to some degree a personal factor, but also I feel it was due to the fact that many of the stations were geared much more towards medical students than other health care professions ... I was really looking forward to this as a learning opportunity to be part of an inter-professional team, and I think it has the potential to be a fantastic teaching session, as long as it is applicable and useful to all healthcare professions.” [2016-17, 18, Male, Year 4]

“It felt like the pharmacy students were quite shy and would let the medical students do everything until the medical student got stuck. Perhaps the pharmacy students could be better briefed so they get more involved.” [2013-14, 19, Female, Year 4]

“It would be useful to have a 10 minute primer for some of these scenarios. It was evident from my own experience and from that of my colleagues that some nurses were unclear as to their role and responsibility” [2015-16, 21, Male, Year 5]

“Encourage the nurses more to take charge of the scenarios where they are meant to run it. Because they were often just leaving it to us when it was their role.” [2015-16, 19, Female, Year 5]

“To have mainly final year nursing students. Some first years couldn't complete the tasks required.” [2016-17, 22, Female, Year 5]

“The pharmacists' knowledge was not developed enough for us to learn how our skills complement each other.” [2013-14, 42, Female, Year 4]

“I struggled with my partner as he was in the younger years and didn't complete his parts of the tasks which meant that I ended up doing most of each scenario. I didn't get the most of out the session due to this. I was looking forward to the session as I knew I could get useful information from the pharmacy student but unfortunately I didn't get this.” [2014-15, 19, Female, Year 4]

“More briefing for students before. Pharmacist student didn't know what to do so didn't participate even with a lot of encouragement.” [2013-14, 22, Female, Year 4]

“Give us more information about what the session involved beforehand - I had no idea what to expect and a little preparation would have gone a long way in making the most of it.” [2013-14, 25, Male, Year 4]

“Not an improvement as such, but was surprised the nursing students don't get more simman experience (I believe this was their first time). Maybe consider inviting them along earlier in their course and ours (year 1 nursing, year 2 medic for example).” [2013-14, 19, Male, Year 5]

“Would be useful to introduce the nursing students to Sim Man prior to jumping straight into the scenario as my partner remarked that it was quite daunting to use it for the first time.” [2016-17, 18, Male, Year 5]

“... the pharmacy students didn't seem to know many topics or were used to the OSCE style stations, which meant that the medical students had to take much of the lead, which didn't seem to be the purpose of the session.” [2016-17, 18, Female, Year 4]

"It wasn't always clear what we were expected to do in each station, or who was supposed to do what." [2015-16, 22, Female, Year 4]

"Ensure stations are split half and half for pharmacy students and medical students, as the OSCE seemed more geared towards what we had learnt on our course than the pharmacy students." [2013-14, 19, Female, Year 4]

"The psych timetable meant I was unable to attend, not sure how much can be done about that but it is a bit annoying." [2014-15, 18, Male, Year 4]

"It was the day before our SSS presentation." [2014-15, 18, Female, Year 4] NB this is a formal Year 4 assessment

"Don't hold it in the middle of the week for students on placement in LOCATION - we were mostly staying away in LOCATION and had to drive back just for this exercise in the middle of a week." [2013-14, 35, Female, Year 5]

"We had 2 medical students and 1 nurse which meant that sometimes there was a person not really doing anything in the scenarios." [2016-17, 19, Female, Year 5]

"Make sure equal numbers of each and proper delegation of partnering up. I was placed with a fellow medic; whilst useful, it wasn't the point of the exercise." [2014-15, 24, Male, Year 5]

"I think this should be used throughout the years - it is a much more practical approach to IPL. I also think we should complete these sessions with other specialities (particularly Physician Associates)." [2015-16, 21, Female, Year 4]

"Would be helpful to have a couple sessions working with the nurses through various scenarios as this was enjoyable and a new experience." [2013-14, 20, Female, Year 5]

"... could there be IPL OSCEs earlier in the course? Seems to make sense to learn IPL in clinical scenarios rather than exercises in class room." [2016-17, 18, Male, Year 5]

*Key: [Year of study, Age, Gender, Year group]*

*NB Unedited/uncorrected comments provided by the students in response to the open ended question.*

**Box 5: Full details of the 6 stations for the nursing and medical student ICS sessions: Evolution from 2012-13 to 2019-20.**

Scenario title	Scenario content	Original content of 2012-13 pilots	Changes made over the years to 2019-20
Social History	Patient is independent and refusing help. Daughter has additional information / different view and is anxious father gets more care.	Patient (actor) interviewed by medic and relative (tutor in role play) by nurse.	<ul style="list-style-type: none"> <li>- Increased from 15 to 20 minutes.</li> <li>- Second actor added (for relative), allowing tutor to supervise 3 different pairs of students and give feedback (alongside actors) in last 5 minutes.</li> </ul>
Telephone Communication	Fever due to neutropaenic sepsis in patient post chemotherapy.	Nurse to ring doctor and handover using SBARD (situation, background, assessment, recommendation, decision) structure.	<ul style="list-style-type: none"> <li>- Increased from 15 to 20 minutes.</li> <li>- Expanded tutor and student instructions (<i>see example in Box 6</i>).</li> </ul>
Emergency assessment and management	Infective exacerbation COPD (chronic obstructive pulmonary disease) with fast AF (atrial fibrillation).	Apply oxygen, nebulisers, complete observation chart (including EWS - early warning score) and drug charts.	<ul style="list-style-type: none"> <li>- Increased from 15 to 20 minutes.</li> <li>- Interpretation ABGs (arterial blood gases) introduced.</li> <li>- Expanded tutor instructions to include teamwork debriefing.</li> <li>- Student instructions revised to clarify roles.</li> </ul>
Cannulation and insulin and fluid administration	Hyperkalaemia scenario - interpret blood tests, suggest treatment and institute management.	Cannulate arm and administer appropriate SC (subcutaneous) insulin and IV (intravenous) fluids	<ul style="list-style-type: none"> <li>- Increased from 15 to 20 minutes</li> <li>- Data interpretation and prescription element removed to allow more time and balance contribution from nursing and medical students.</li> <li>- Students use pre-prescribed regimen but still have to cannulate, give SC insulin dose and set up a fluid infusion (<i>see example in Box 6</i>).</li> </ul>
Data Interpretation	Patient A - venous ulcer image and charts. Patient B - frail, thin older patient with long term catheter and skin at risk.	Patient A - calculate ABPI (ankle-brachial pressure index) and EWS. Patient B - interpret urinalysis. Calculate BMI (body mass index) and Waterlow	<ul style="list-style-type: none"> <li>- Increased from 15 to 20 minutes.</li> <li>- Introduced written answer sheet to allow verbal debrief with tutor to three pairs of students together in the last 5 minutes.</li> </ul>

		score and discuss CPR (cardiopulmonary resuscitation) status.	
Manual Handling	Confused patient slipped down bed and tangled with drip and catheter.	Risk assess. Move patient together using slidesheet while maintaining dignity and communication.	<ul style="list-style-type: none"> <li>- Increased from 15 to 20 minutes.</li> <li>- Clarification of task to students through revised instructions.</li> <li>- More detailed actor instructions.</li> </ul>

**Box 6: Examples of station development. Taken from the Telephone Communication station (notes for tutors) and Cannulation station (background for students) between 2012-13 and 2019-20.**

Instructions used for the station for 2012-13	Instructions used in the station for 2019-20
<p><b>Telephone Communication station: Tutor notes</b></p> <p>There are 15mins for this station in total. Oversee the role play of the telephone call without interruption. They should both be familiar with and use the SBARD framework. When they have finished get them to discuss their telephone c/s and in particular the advantages and disadvantages of the SBARD framework. The call should only take a few minutes so there may be sufficient time to re-run the call if they wanted to practice again after feedback.</p> <p>The observation chart should trigger them to realise that the patient is unwell. (his B/P120/80, P84, RR12, T36.4 and urine output 100mls/hr. Changing over the five hour period to B/P80/60, P112. RR18, T39.0 and urine output 20mls/hr).</p>	<p><b>Telephone Communication station: Tutor notes</b></p> <p>There are 20mins for this station in total and you need to look after 3 pairs of students. A bell will sound half way through. You can run the session however you like however the following notes are some suggested guidance.</p> <ol style="list-style-type: none"> <li>1. Ensure they understand their instructions and then start the 3 student pairs off on their conversation. Try not to interrupt the conversation but observe all 3 pairs during the task. The initial call is unlikely to take more than 5mins.</li> <li>2. When all 3 pairs have finished you can call the group together and discuss what went well and what went less well for each pair. They will probably want to have 'the correct answer' for management but encourage them to think more about the process than the content. The observation chart should trigger them to realise that the patient is unwell (his B/P120/80, P84, RR12, T36.4 and urine output 100mls/hr, changing over the five hour period to, B/P80/60, P112. RR18, T39.0 and urine output 20mls/hr). The plan should include increased observation frequency/checking obs, EWS calculation, fluid resuscitation, considering sepsis, possibly neutropenic sepsis (? FBC/Cultures) and early medical review.</li> <li>3. One debrief strategy might be to;             <ol style="list-style-type: none"> <li>a. Ask the medics if they had sufficient information to make a clinical judgement(s), did they feel a sense of urgency etc</li> <li>b. Then ask the nurses to comment on the Drs responses. Did they feel there was a clear plan? Did they feel adequately supported and involved in the plan of action?</li> <li>c. Consider what communication strategies got the best combined outcome? If they didn't use an SBARD or similar frame work discuss this</li> </ol> </li> </ol>

	<p>option and how this supports systematic assessment and decision-making. Hand out the SBARD cards.</p> <p>4. If you have time ask them to discuss handovers/telephone interacts they have seen or heard on the ward. What have they taken away from observing these interactions?</p> <p>5. Collect the SBARD cards up again ready for the next group</p>
<p><b>Cannulation station: Background for students</b></p> <p>This arm belongs to Mrs. Judith Wallace, a 53 year old lady admitted with sepsis and dehydration.</p> <p>Your task is to;</p> <ul style="list-style-type: none"> <li>• Insert a venous cannula</li> <li>• Interpret her blood results</li> <li>• Deliver some treatment for her hyperkalaemia using the equipment and drugs provided.</li> </ul> <p>You have 15 minutes for this station.</p>	<p><b>Cannulation station: Background for students</b></p> <p>You are working on the medical assessment unit. This arm belongs to Mrs. Judith Wallace, a 55 year old lady with insulin dependent diabetes mellitus who has just been admitted with diarrhoea and dehydration. She has been seen by the medical registrar who has prescribed her some treatment. You will be given her drug chart.</p> <p>Your task is to;</p> <ul style="list-style-type: none"> <li>• Cannulate the arm</li> <li>• Deliver the appropriate insulin</li> <li>• Set up the intravenous fluid including calculation of the appropriate drip rate per minute / setting up the infusion pump</li> <li>• Please sign and time the charts for insulin and fluids but please note how the drug chart (a Master version with green cover) is completed for both these procedures.</li> </ul> <p>Please note that it is 12 noon and she is about to have lunch. Her pre-lunch BM is 6.</p> <p>You have 20 minutes for this station.</p>