Future Applications of Point-of-Care Ultrasound (PoCUS) Education in RCSI's Undergraduate Curriculum

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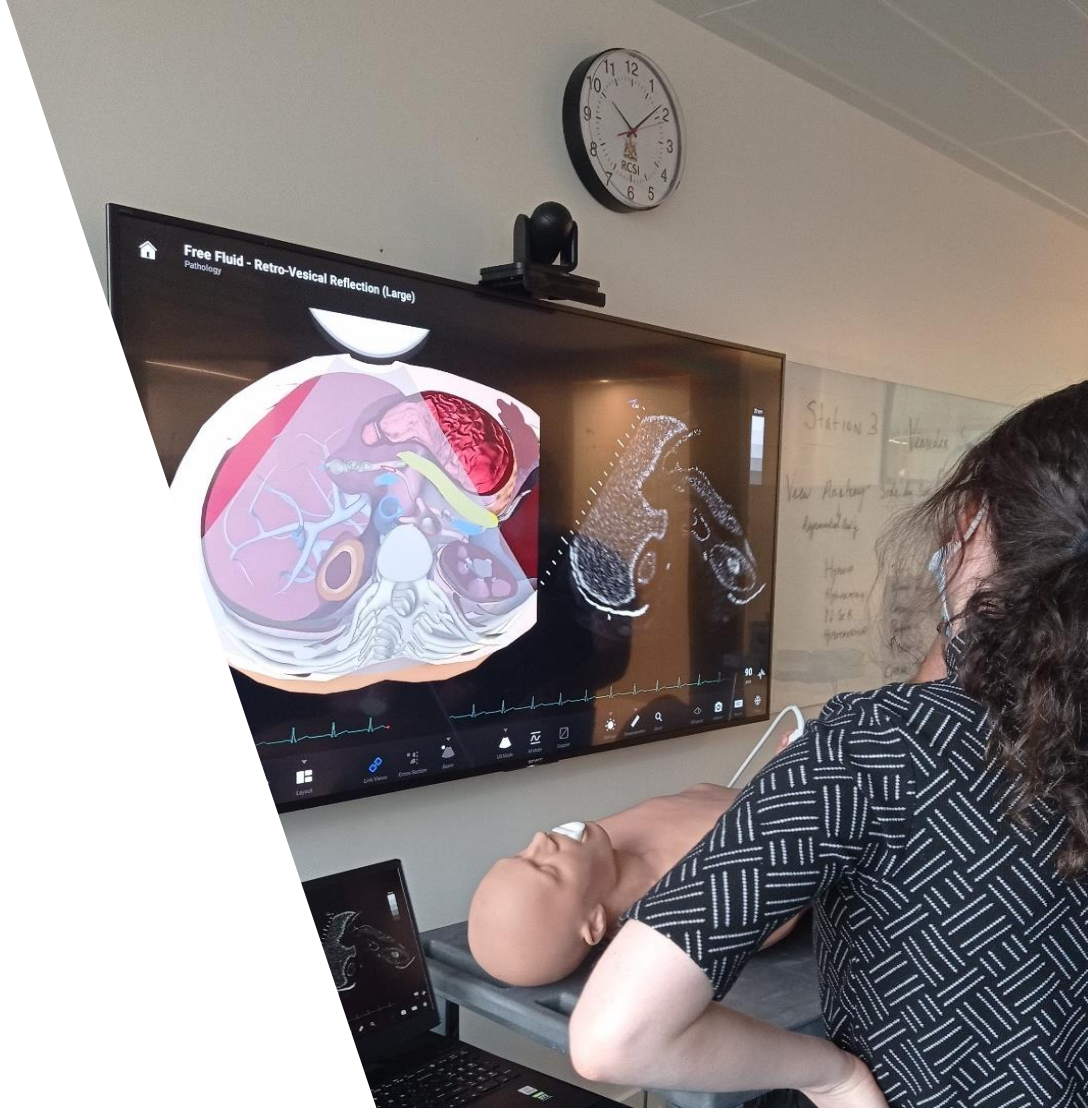

National Student Engagement Programme
Clár Rannpháirtíochta Náisiúnta na Mac Léinn

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Introduction and Context

Ultrasonography is an invaluable tool used in a wide variety of specialties. In order for an individual to become clinically competent using an ultrasound probe, they must feel comfortable using one. Therefore, we believe that point of care ultrasound must become an integral aspect of RCSIs teaching for its medical students and beyond.

The first **PoCUS** event in collaboration with Radiology Society students, RCSI SIM team and clinicians took place in **March 2020**. This was the first pilot student and staff partnership with the common goal of establishing ultrasound as a fundamental medical programme skill.

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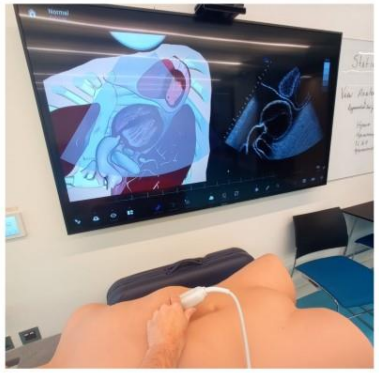
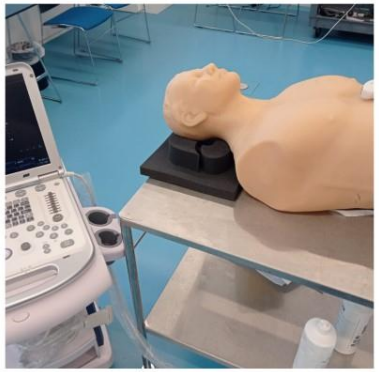
Introduction and Context





Students expressed excitement and a positive attitude towards ultrasound skills learning and RCSI SIM felt there was scope to introduce PoCUS in the form of an interactive workshop.

The planning started during the first COVID-19 pandemic, when it was difficult for students to access training opportunities in clinical settings due to the ongoing healthcare crisis. Students and SIM came together to create the programme.

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Research and Development

Currently in Ireland, **no undergraduate medical school** reports having a formalized ultrasound curriculum in place. Integrating PoCUS into the curriculum will diversify student's skillset to excel in their future clinical careers.

Decisions on the correct approach to the ultrasound fundamental skills programme was thoroughly discussed and planned between the Radiology Society students, Director of Simulation Education and RCSI SIM team technicians.

The format of the day and what technology would be used during the teaching was an essential part of the planning. What are the **needs of our students**? How best can they learn in a **safe environment**? All these questions were fundamentally important in the curriculum planning stages.

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Actions taken during the project

Action	Brief Description
Action A	**Initial meetings** – Student educators and RCSI SIM staff met to establish learning outcomes, and build a team of interested student educators. Student educators self-selected weeks for teaching based on their availability. All of the meetings were managed by RCSI Senior Simulation Technician.
Action B	**Format of the teaching established** – students and the RCSI SIM team proposed potential stations, brainstormed teaching methods and agreed on a format through consensus.
Action C	**Choice of the equipment and technology used for the proctored workshop** – decision based on the equipment available and student educator self-selection.
Action D	**Securing of the loan of CAE VIMEDIX ultrasound simulator from Germany** – students and staff worked together to draft a proposal, which was approved by CAE.
Action E	**Creation of the post workshop survey using QR code –** Students and staff proposed questions, considered potential feedback parameters and agreed on a finalised questionnaire.

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Actions taken during the project

- Senior cycle 5th year **medical students** and RCSI SIM staff in charge of delivering workshops for the students.
- The teaching was carried out as part of the **radiology module** for the 3rd year medical students in the RCSI simulation facilities under the supervision of Director Of Simulation Education Dr. Claire Condron.
- Senior Simulation Technician Miroslav Voborsky in charge of the equipment set up and occasional teaching during the workshop.
- Rebecca Kirrane from RCSI SIM in charge of correct survey data collection. QR code created.
- **10 weeks** of the teaching for **300** third year medical students established.
- **Radiology lecture** delivered as a part of the teaching day explaining basics in ultrasound scanning.

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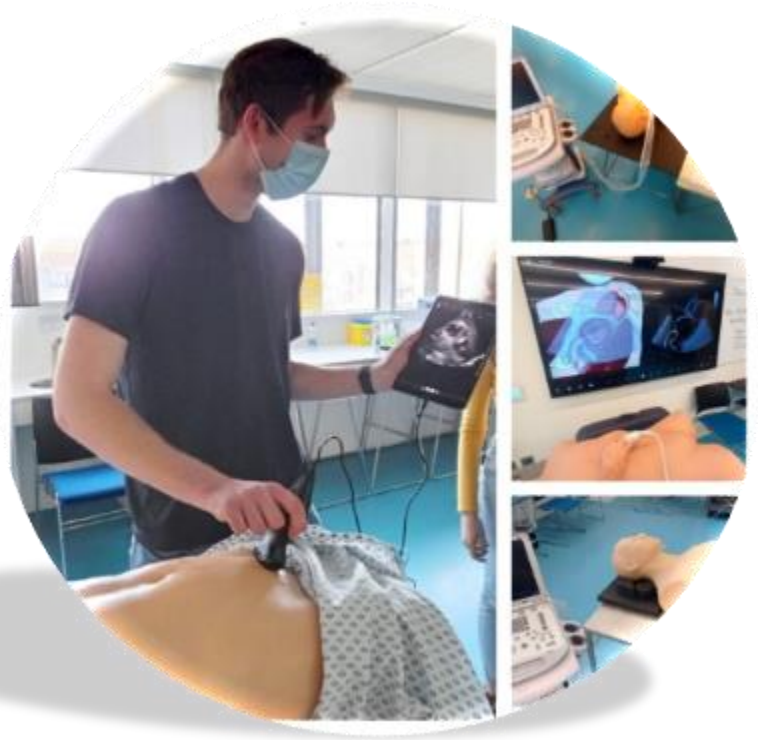
Methodology

CAE Vimedix ultrasound simulator utilising augmented reality colorization and 3D modeling.



Learning and performing an **Extended FAST scan** with focus on bright mode image acquisition and free fluid recognition.

Practical placement of **Peripheral/Central IV-line insertion** helping students identify vasculature while also manipulating the ultrasound probe as a procedural adjunct.

Students were asked to complete a **post-workshop survey** to investigate their attitudes towards ultrasound teaching in undergraduate medical education.

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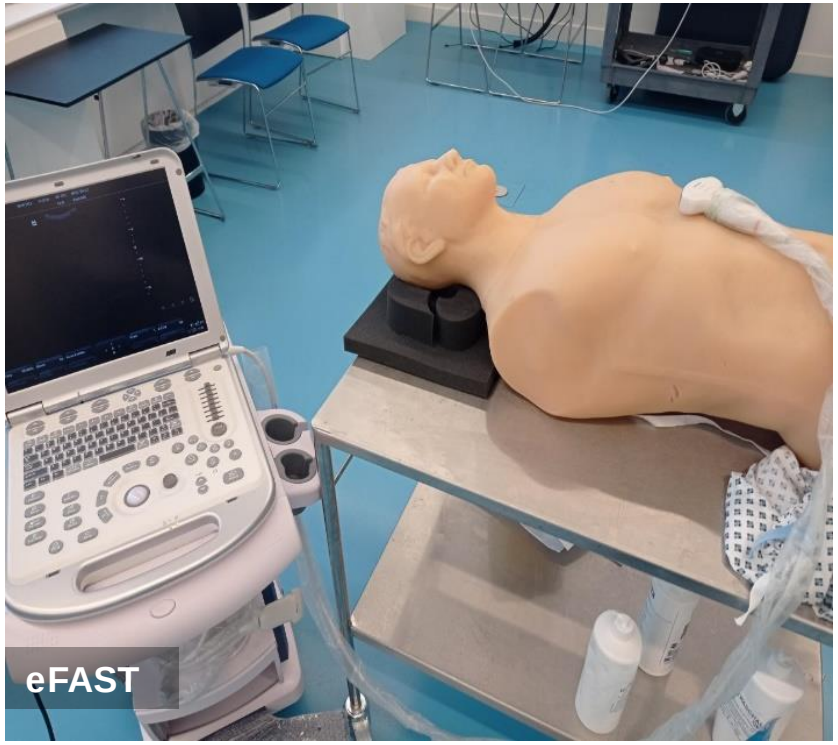
PoCUS Stations

VIMEDIX Simulator

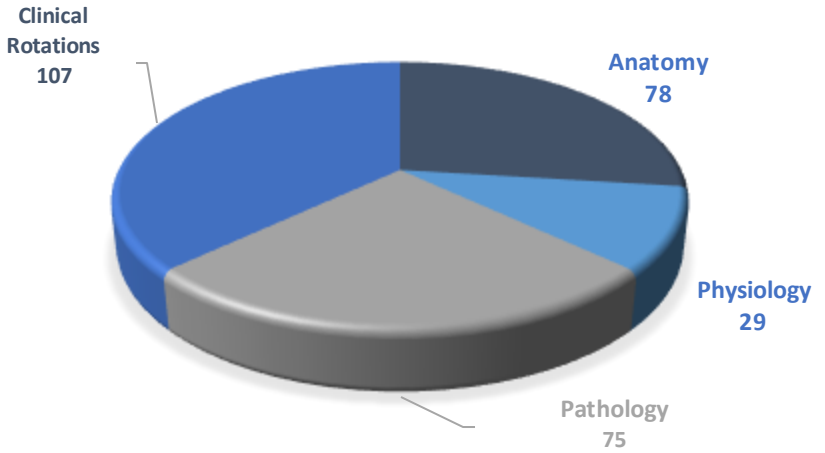

IV Line Insertion


eFAST

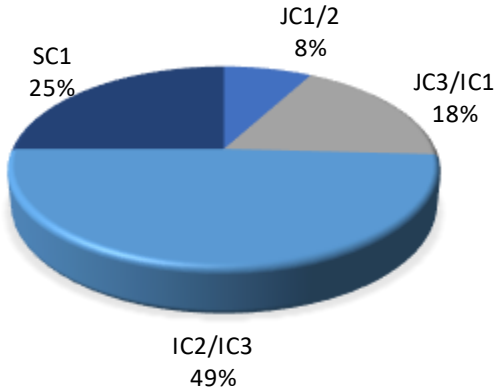
Student's Post-Workshop Survey Results

Have you used ultrasound before?

What subjects do you think would benefit the most from the addition of POCUS?



What years do you think learning about POCUS would be most beneficial?



Do you wish RCSI incorporated POCUS training into your curriculum?

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What did you find most useful about the POCUS stations today?

"Getting to use the ultrasound and getting familiar with how it works and how to use the probe to get appropriate images"

"It was good to be able to visualize the anatomy rather than just learn it on paper"

"It was very interesting and really helps me put my anatomy and things I am learning in textbooks in context"

"It was pretty useful to have hands-on on US technology. Absolutely great learning experience"

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Reflections on engagement

- RCSI students and RCSI SIM currently in preparation for the 3rd consecutive year of the fundamental ultrasound skills teaching.
- Dr Jack Karp RCSI medical graduate class 2022 awarded RCSI student Partnership Champion 2021.
- Miroslav Voborsky RCSI SIM presented project at the CAE Simulation Conference in Nottingham November 2021.
- Jack Karp and Miroslav Voborsky presented on RCSI innovation award.
- Jack Karp presented poster on ASPiH 2021 Simulation Conference.
- Article published in the International Journal Of Healthcare Simulation- https://www.ijohs.com/article/doi/10.54531/RYJX3157


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RCSI STUDENT ENGAGEMENT PARTNERSHIP

RCSI Student Partnership Champion 2021

is awarded to

Jack Karp

in recognition of your outstanding contributions in helping to enhance the overall RCSI student experience by collaborating with staff and sharing your expertise and perspectives on key RCSI projects

Professor Hannah McGee
RCSI Deputy Vice-Chancellor for Academic Affairs

Professor Celine Marmion
RCSI Deputy Dean for Student Engagement

DECEMBER 2021

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Reflections on engagement

We have learned many lessons during the very first year of the PoCUS fundamental skills workshops.

- There was occasionally a mis-match between student educators' skills and experience, and the stations planned. We have since established better rota system to best match student educators' ultrasound experience with the particular skills and ultrasound stations they teach.
- Student educator availability was sometimes an issue (due to unexpected absences, illness etc.) so we have since established a pool of "standby educators" for each week.
- Students indicated that they would like more resources and pre-reading on PoCUS skills, so they could grasp the basic concepts before coming to the tutorial. To meet this need, Senior Technician Tim Lawler created 14 instructional fundamental ultrasound skills videos in collaboration with student PoCUS educators. Theses instructional videos are now hosted and accessible to all of the medical students and staff on the virtual learning environment. Having access to these resources pre- and post- workshop allows students to spend more time practicing the skills hands-on during workshops.

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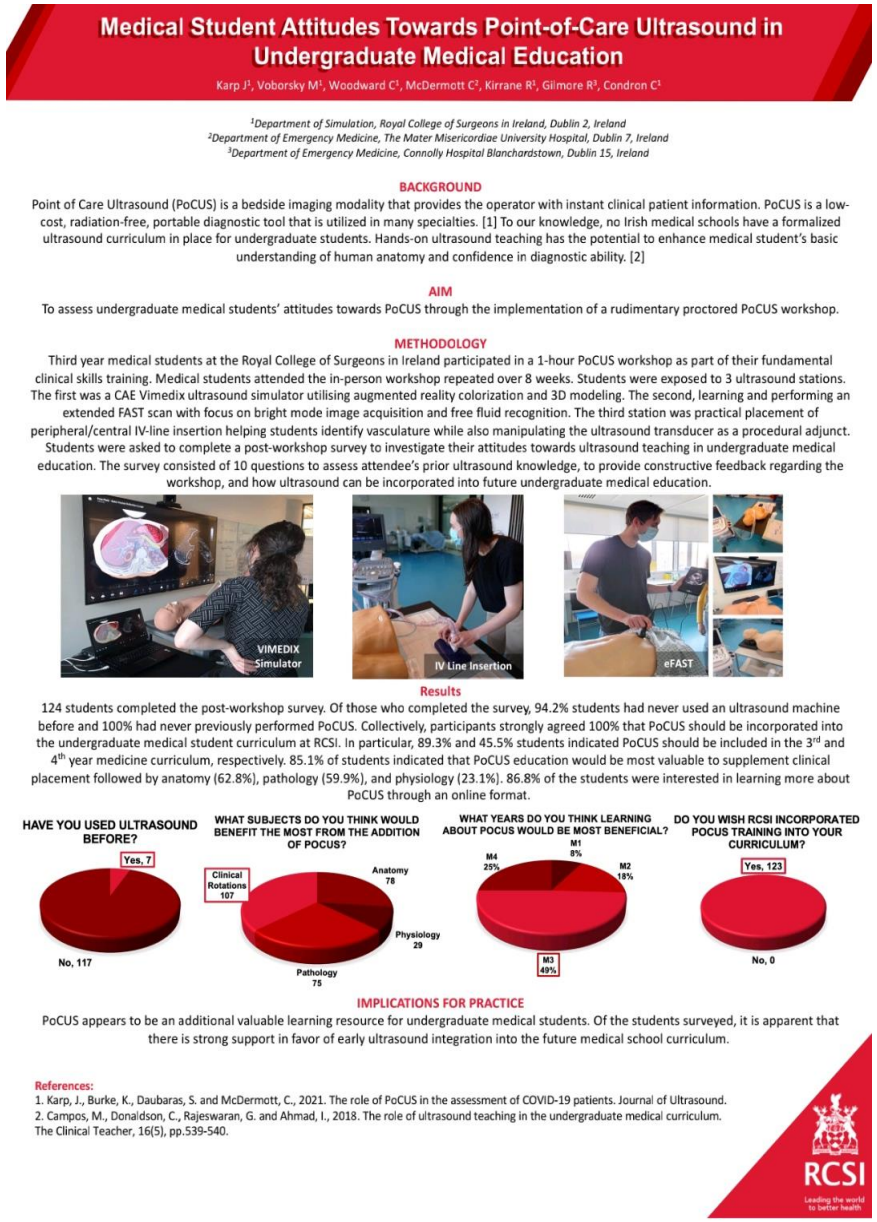
Supporting evidence and references

Karp et al (2021). 72 Medical Student Attitudes Towards Point-of-Care Ultrasound in Undergraduate Medical Education. *International Journal of Healthcare Simulation*. 2021 (1) (1). Available online: https://www.ijohs.com/article/doi/10.54531/RYJX3157

Simulated solutions in response to the pandemic [21 Oct 2021]. RCSI website. Press release. Available online: https://www.rcsi.com/impact/details/2021/10/simulated-solutions-in-response-to-the-pandemic



Medical Student Attitudes Towards Point-of-Care Ultrasound in Undergraduate Medical Education

Karp J[1], Voborsky M[1], Woodward C[1], McDermott C[2], Kirrane R[3], Gilmore R[3], Condron C[1]

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[2]Department of Emergency Medicine, The Mater Misericordiae University Hospital, Dublin 7, Ireland
[3]Department of Emergency Medicine, Connolly Hospital Blanchardstown, Dublin 15, Ireland

BACKGROUND

Point of Care Ultrasound (PoCUS) is a bedside imaging modality that provides the operator with instant clinical patient information. PoCUS is a low-cost, radiation-free, portable diagnostic tool that is utilized in many specialties. [1] To our knowledge, no Irish medical schools have a formalized ultrasound curriculum in place for undergraduate students. Hands-on ultrasound teaching has the potential to enhance medical student's basic understanding of human anatomy and confidence in diagnostic ability. [2]

AIM

To assess undergraduate medical students' attitudes towards PoCUS through the implementation of a rudimentary proctored PoCUS workshop.

METHODOLOGY

Third year medical students at the Royal College of Surgeons in Ireland participated in a 1-hour PoCUS workshop as part of their fundamental clinical skills training. Medical students attended the in-person workshop repeated over 8 weeks. Students were exposed to 3 ultrasound stations. The first was a CAE Vimedix ultrasound simulator utilising augmented reality colorization and 3D modeling. The second, learning and performing an extended FAST scan with focus on bright mode image acquisition and free fluid recognition. The third station was practical placement of peripheral/central IV-line insertion helping students identify vasculature while also manipulating the ultrasound transducer as a procedural adjunct. Students were asked to complete a post-workshop survey to investigate their attitudes towards ultrasound teaching in undergraduate medical education. The survey consisted of 10 questions to assess attendee's prior ultrasound knowledge, to provide constructive feedback regarding the workshop, and how ultrasound can be incorporated into future undergraduate medical education.

Results

124 students completed the post-workshop survey. Of those who completed the survey, 94.2% students had never used an ultrasound machine before and 100% had never previously performed PoCUS. Collectively, participants strongly agreed 100% that PoCUS should be incorporated into the undergraduate medical student curriculum at RCSI. In particular, 89.3% and 45.5% students indicated PoCUS should be included in the 3rd and 4th year medicine curriculum, respectively. 85.1% of students indicated that PoCUS education would be most valuable to supplement clinical placement followed by anatomy (62.8%), pathology (59.9%), and physiology (23.1%). 86.8% of the students were interested in learning more about PoCUS through an online format.

IMPLICATIONS FOR PRACTICE

PoCUS appears to be an additional valuable learning resource for undergraduate medical students. Of the students surveyed, it is apparent that there is strong support in favor of early ultrasound integration into the future medical school curriculum.

References:

1. Karp, J., Burke, K., Daubaras, S. and McDermott, C., 2021. The role of PoCUS in the assessment of COVID-19 patients. Journal of Ultrasound.
2. Campos, M., Donaldson, C., Rajeswaran, G. and Ahmad, I., 2018. The role of ultrasound teaching in the undergraduate medical curriculum. The Clinical Teacher, 16(5), pp.539-540.

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Leading the world to better health

Image: Poster presentation on PoCUS

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Thank you!

QQI

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Dearbhú Cáilíochta agus Cáilíochtaí Éireann

USI

Union of Students in Ireland

Aontas na Mac Léinn in Éirinn

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