#7EE01 (2107)
"Double jump" assessment as an alternative way to improve clinical reasoning in undergraduate medical students

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Background: “Triple jump” assessment is an option for evaluating clinical reasoning in undergraduate medical students, composed by a tree stage exercise: in the first step, a clinical problem enables prior knowledge exploration; the second is for conducting information search and the third is for oral discussion.

Summary of Work: We proposed a simplification for this assessment, named "double jump", in which the evaluation of the student only reflects the initial problem interpretation, without oral discussion. This work evaluated the correlation between "jump" assessment and multiple-choice summative final examination grades, before and after the simplification proposed.

Summary of Results: Grades of 426 students were included. Both "jump" assessment were effective (p<0.0001), "Triple jump" approval correlate with mean final exam score 7.23 +/-0.05 while reproved ones obtained mean 6.86 +/-0.07; "double jump" approval correlate with mean final exam score 7.59 +/-0.06 while disapproval ones obtained mean 6.94 +/-0.05.

Discussion: "Jump" type assessments are important for evaluating individual reasoning outside the group context in which PBL students usually deal. Eliminating the third step reduces subjectivity of oral discussion and evaluation, which students and teachers consider as a stress factor.

Conclusion: This study showed that shifting the "triple jump" test to "double jump" did not compromise the reliability of the assessment instrument and simplified the evaluation process.

Take-home Message: "Double jump" assessment is an alternative way to improve clinical reasoning in undergraduate medical students, without the complexity and stressful conditions of the original "triple jump" one.

#7EE02 (1501)
The impact of case-based clinical reasoning (CBCR) on the development of medical students' diagnostic skills

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Background: Elaboration of diagnostic skills has been considered a main competency in undergraduate medical education. Since 2013 CBCR course has been introduced for pilot group of 3rd year students at Tbilisi State Medical University. CBCR cases were designed by guidelines elaborated by Prof. Olle ten Cate at University Medical Center Utrecht.

Summary of Work: To investigate the effectiveness of CBCR we compared results of integrated clinical examination (Internal Medicine, Surgery and Obstetrics/Gynecology) of 6th year students previously taught with CBCR (80 students) to the results of students taught with traditional curriculum (120 students). Examination scores for both groups were compared by Student's "t" test.

Summary of Results: Our study showed that students who were taught CBCR during preclinical studies had significantly higher score in clinical examinations (37.5±1.14 out of 40 score) compared to students who were taught by traditional curriculum (30.2±0.97, p<0.01). This comparison shows that introduced CBCR led to the improvement of clinical reasoning of students.

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Conclusion: Introducing CBCR for medical students at preclinical stage has significant positive impact on the development of the diagnostic thinking ability in clinical subjects. Therefore, CBCR might be considered as an useful teaching tool for mastering students in differential diagnosis.

Take-home Message: Introduction of CBCR course in traditional curriculum is considered to be an important method for improvement of teaching and learning, enhancing students’ clinical reasoning ability.
#7EE03 (895)
**Implementation of an online course to teach and assess clinical reasoning with virtual patients and concept mapping**

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**Discussion:** Clinical reasoning is a complex set of skills healthcare students have to acquire during their education. Virtual Patients (VPs) support the teaching of clinical reasoning skills in healthcare education. However, it remains unclear how VPs can optimally foster clinical reasoning. Our aim was to develop a research-based clinical reasoning course.

**Summary of Work:** Based on a framework developed in a grounded theory exploration, we conceptualized and implemented an online course to teach clinical reasoning. The course consists of short videos explaining basic concept of clinical reasoning, 50 short VPs combined with a concept mapping tool, and process-oriented feedback based on learning analytics.

**Summary of Results:** A pilot study with 4th year medical students shows that it is challenging for students to distinguish findings from diagnoses or identify relevant problems from the narrative. Some students did not interact at all with the concept mapping tool. Results of the main study will be presented at the conference.

**Discussion:** The results of the pilot study indicate a need for more individualized and adaptable scaffolding for creating the concept map. In the main study we will analyze usage patterns focusing on what the learners did and their development over time and across VP sessions.

**Conclusion:** VPs can offer a safe environment to develop clinical reasoning skills before seeing patients for example during internships. Therefore, we plan to expand the current VP collection to include more VPs. We will develop a concept about how to integrate the course in a blended learning setting into healthcare curricula.

**Take-home Message:** Virtual patients can be more specifically tailored to foster clinical reasoning, by combining VPs with concept mapping approaches and providing process-oriented feedback based on learning analytics.

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#7EE04 (363)
**Case representation scaffolds improve diagnostic efficiency in 4th-5th year medical students: results of a randomized controlled study**

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**Background:** Representation is an important cognitive action in the diagnostic process and correlates with accuracy. We hypothesized that representation also influences diagnostic efficiency as both are process variables. As intermediate students have problems with correct case representations we tested whether representation scaffolds during case processing improve diagnostic efficiency in medical students.

**Summary of Work:** Clinical cases were provided in an electronic learning environment. The scaffolding group wrote down case representations while diagnosing cases in the intervention phase. Both groups processed further cases without scaffolds in the assessment. Diagnostic efficiency was operationalized as the number of correct diagnoses divided by the time needed for diagnosing.

**Summary of Results:** Diagnostic efficiency was significantly improved by the representation scaffolding (M = 0.12 correct diagnosis/total time (SD =0.07) vs. M = 0.09 (SD = 0.06), p = .045. Clinical Reasoning of the participants differed significantly between the groups regarding the sequence of clinical information and the time spent on different diagnostics.

**Discussion:** Intervention by scaffolding for case representation summaries significantly improved diagnostic efficiency of intermediate medical students as they needed less time to solve the cases. Although they spent less time on task diagnostic accuracy did not change. Upcoming studies will elucidate interplay of representation scaffolding and expertise level of the learners.

**Conclusion:** For the first time, diagnostic efficiency as part of the diagnostic process of medical students has been studied economically and standardized by an electronic learning environment. Representation scaffolds improved diagnostic efficiency in intermediate students.

**Take-home Message:** Scaffolding diagnostic actions like representation of the case is a powerful tool to improve the diagnostic process of learners. Diagnostic efficiency is an important outcome variable in clinical reasoning research as it corresponds to workplace challenges on the first day of clinical practice.
Using simulation to develop clinical reasoning in veterinary students

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Background: Veterinary graduates have been shown to have underdeveloped clinical reasoning ability. The aim of this research was to investigate the use of high fidelity clinical simulation as a method to improve the clinical reasoning ability and confidence of fifth year veterinary students.

Summary of Work: A simulated general practice consultation exercise, focusing on clinical decision-making and utilising standardised clients and animals, was created and implemented for final year veterinary students. Clinical reasoning improvement during the simulation was determined using both quantitative (researcher-assessment, self-assessment, survey) and qualitative (focus groups) methods.

Summary of Results: The simulated consultations were shown to increase student confidence in their clinical reasoning ability. They were also found to provide situated learning; allowing practice of multi-tasking, coping with stress and being responsible for clinical outcomes. There was evidence that simulation objectively improves some aspects of clinical reasoning, including differential-diagnosis formation.

Discussion: During this study, the differences between the decision-making students practice during their time in education, and the decision-making they will use once working were highlighted. High fidelity simulation partially bridged this gap, by emulating the responsibility of making clinical decisions without a teacher acting as a ‘safety net’.

Conclusion: Within Veterinary education, simulation is currently limited to communication skill development using standardised patients, or part-task simulators. This should be expanded on within veterinary schools, as there is potential for simulation to improve higher order skills. Although expensive and time consuming, the potential benefits appear to outweigh the costs.

Take-home Message: Clinical reasoning ability and confidence in veterinary students can be developed using high fidelity standardised client simulation; a teaching method not currently commonly utilised within veterinary curricula.

Spirals: A New Cognitive Approach to Teaching and Learning Clinical Reasoning in Emergency Medicine

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Background: The emergency department (ED) is unique. Pace, cognitive load and scant clinical information mandate critical decisions with immediate consequences. Patient care requires, nimble course correction and disposition, considering proper allocation of healthcare resources. We do not prepare undergraduates to act as leaders in this environment. They present static “laundry lists”.

Summary of Work: Naturalistic observation of ED physicians, describing potential SPIRALS behaviours. Investigators developed this non-linear cognitive reasoning approach (Sick, Pain, Investigate, Resuscitate, Assess Again, Leaves ED), a recursive acronym and learner-centred mnemonic, potentially more appropriate in ED than currently used static mnemonics like RAPID or SNAPPS.

Summary of Results: ED observation field notes documenting behaviours of n=4 physicians. Thematic analysis of content analyzed and coded by two research team members. Preliminary analysis suggests observations of common physician behaviors: multiple simultaneous initial patient assessments, investigations, treatments, repeated patient follow-ups, course-corrections and eventual disposition.

Discussion: Preliminary analysis suggests SPIRALS behaviours exist. Physicians constantly re-evaluate patients and engage with colleagues to ensure high quality patient care. This non-linear approach is potentially more effective and efficient for the unique ED environment. SPIRALS teaching may benefit ED learners by emphasizing iterative patient review, evolving patient care and disposition.

Conclusion: ED physicians observed demonstrated SPIRALS behaviours. Subsequent study phases will explore and assess the most effective method for teaching SPIRALS. This may benefit medical students as learners and contribute to development of leadership competencies, especially for practicing in an ED or similar environments.

Take-home Message: Medical students are not appropriately taught to follow their patients over their entire journey in the fast-paced and ever-changing ED. This pilot study suggests that a SPIRALS teaching intervention/mnemonic will provide a framework for ED learning, increase students’ confidence, and help guide their patient interactions.
#7EE07 (2830)  
Developing a model for teaching and assessing critical thinking skills in medicine: a qualitative study

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Background: Despite the vested interest developed among medical colleges in improving critical thinking, evidences indicate that assessment of medical students’ ability to think critically is a constant challenge. Aim of the current study was to provide a model for teaching and assessing critical thinking as a major outcome of medical education.

Summary of Work: A descriptive qualitative study using semi-structured interviews has been conducted. A purposive sampling has been drawn. 17 individual interviews were conducted with three groups of participants: faculty members, students and graduates. Qualitative data was analysed by content analysis approach. Data collection and analysis were concurrent.

Summary of Results: A total of 1049 primary-code obtained from analysis of interviews were summarized into 272 codes which were classified into 61 subcategories, 13 categories and four themes, including “critical thinking requirements: preconditions and approaches”, “critical thinking initiators: internal and external stimulus”, “critical thinking process: application of theory in practice”, and critical thinking outcomes: accomplishments”.

Discussion: We proposed a model for teaching and assessing critical thinking in medicine. While several studies have investigated different aspects of critical thinking, this study contributes further insights to the debate on critical thinking in medicine as a context-bound concept by exploring cognitive processes and its structures.

Conclusion: Critical thinking skills in medical professions include the elements and structures whose description of their relationships based on a proposed model can be a basis for conducting educational programs and formulating an effective tool in order to assess these skills among medical students.

Take-home Message: The medical teacher should be taken a subject-specific components of critical thinking into account in their teaching and testing.

#7EE08 (1018)  
Effects of blended learning on the clinical reasoning process of Japanese nurses trained in Specified Medical Acts

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Background: In 2015, Japanese nurses began training in Specified Medical Acts (SMAs) such as artery insertion and debridement. Nurses learned the clinical reasoning process that doctors use to assess whether or not they can implement SMAs due to patient safety. However, nurses often have difficulties with the reasoning process.

Summary of Work: This study applied blended learning to clinical reasoning instruction for nurses and investigated the outcomes. Eighty-three nurses participated. The courses were designed using e-learning and required inference, active involvement, simulation in that they played the doctor’s role, and clinical practice. The logs including medical reports, questionnaires, and interviews were analyzed.

Summary of Results: In the medical reports, participants were able to describe the clinical reasoning process including the doctor’s viewpoint. Additionally, they acknowledged their role as nurses and the difference between their competencies and the doctors’. They also realized it was easier to have discussions with doctors.

Discussion: The blended learning process helped develop the ability of clinical reasoning because participants gradually incorporated it into their reasoning process. Additionally, the process fostered mutual understanding and collaboration among professionals since participants were able to communicate with professionals. Thus, the process extended the competencies of nurses.

Conclusion: This blended learning model is effective for nursing instruction on the clinical reasoning process. Moreover, it helps develop professionalism and mutual understanding. As nurses expand their competencies in SMAs, they can also benefit by gaining an understanding of other medical practitioners.

Take-home Message: Blended learning that includes active involvement was effective in learning clinical reasoning. In addition, blended learning includes an understanding of the mutual differences between the thinking processes of doctors and nurses, helps develop the competencies of nurses, and stimulates collaboration between professionals.
**#7EE9 (215)**
Accelerated learning at Masters level: Case-Based Learning of Diagnostic Reasoning skills by Physician Associate Students

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**Background:** In the UK the trajectory of acquiring clinical diagnostic skills for Physician Associate (PA) students is constrained within a 2 year postgraduate programme. The curriculum at Brighton and Sussex Medical School has been designed to facilitate this accelerated trajectory through use of explicit illness scripts during weekly Case Based Learning.

**Summary of Work:** Data collection used a mixed methods approach; Completed 3 times across academic year (Year 1). (1) Diagnostic Thinking Inventory (DTI). (2) Questionnaire: Students self reported engagement with diagnostic thinking. (3) Qualitative data (free text) provided by students describing the influence of case based learning on their diagnostic thinking.

**Summary of Results:** Preliminary results show PA students have a proportionally higher score in flexibility (equivalent to foundation year doctors), compared with structure (equivalent to 3rd year medical students). Early thematic analysis shows engagement with diagnostic thinking in CBL facilitates equivalent discussions in clinical placements.

**Discussion:** Discussion will focus upon the trajectory of learning as illustrated by DTI scores, and the students experience of CBL. There will also be discussion of themes emergent from qualitative analysis of free text boxes.

**Conclusion:** This will be derived from results and discussion.

**Take-home Message:** This study aims to understand if adopting an explicit strategy for development of diagnostic reasoning skills via case based learning can facilitate an increased learning trajectory. It seeks to apply existing knowledge about Case Based Learning as an educational pedagogy to the expanding PA workforce.

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**#7EE10 (415)**
The teaching of clinical reasoning by senior clinicians

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**Background:** At our medical school, the teaching of clinical reasoning starts in a well-structured curriculum in the pre-clinical years. In the clinical years, however, teaching is less structured and delivered by multiple teachers. The aim of our study was to understand how senior clinicians teach clinical reasoning.

**Summary of Work:** Because there are no validated questionnaires to assess how clinical reasoning is taught, we conducted individual interviews with 14 senior clinicians to establish how they defined clinical reasoning, how they were teaching it, how they themselves had been taught, and what changes should be made to their teaching.

**Summary of Results:** Senior clinicians teach clinical reasoning opportunistically. They emphasised the importance of supervised practice, reflection, think aloud, focused data collection guided by the clinical presentation, and the iterative nature of reasoning. They identified teaching as a way to further develop their own reasoning. Few recall being formally taught clinical reasoning.

**Discussion:** Our findings challenge the notion that teachers teach the way they were taught. Though most participants reported that they had not been explicitly taught clinical reasoning they were dedicated to teaching it to their own students. Despite their informal definitions, they suggested teaching clinical reasoning in a systematic way.

**Conclusion:** Overwhelmingly, senior clinicians want to enhance and structure how clinical reasoning is taught in the clinical years. The teaching experiences of senior clinicians appear to be an important resource when revising the curriculum and planning for faculty development about the teaching of clinical reasoning.

**Take-home Message:** Senior clinicians use an apprenticeship model of workplace learning to teach clinical reasoning. This model provides them with opportunities to teach clinical reasoning to their students in a variety of clinical contexts and enables them to make this tacit thinking process as explicit as possible to their students.
#7EE11 (2763)
Effect of Clinical Clerk Ability and Station Content on Clinical Reasoning in an Internal Medicine Structured Oral Examination (SCO)

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**Background:** Little is known about characteristics of clinical reasoning (CR) by clinical clerks. The influence of station content difficulty and overall student ability (as measured by final rotation performance) on CR during a summative examination will be determined - when content knowledge should be at its peak.

**Summary of Work:** Student marks (n=511) were computed for intuitive (System 1), analytic (System 2), and other CR components on 12 SCO rotation examinations over 2 years. Spearman correlation coefficients between students’ performance in these and other clerkship assessment domains were calculated. CR ability was analyzed by clerk final performance and station difficulty.

**Summary of Results:** Intuitive and analytic CR correlated with overall rotation marks ($\rho=.287$ and $.294$) and written examination performance ($\rho=.251$ and $.253$). Correlation between system 1 and 2 thinking increased as student ability in a station’s content weakened. In contrast, there was minimal correlation difference when stratified by students’ overall clerkship performance.

**Discussion:** Clinical reasoning ability, both intuitive and analytic, correlates independently to overall clerkship ability and to performance on a written examination. When weaker in content ability, students exhibit an expected pattern of poor intuitive thinking when analytic ability is weak, and strong intuitive ability when analysis is strong.

**Conclusion:** Clinical clerks are considered relative “novices” in clinical thinking. However when presented with content that they are proficient with, there is no correlation between their intuitive and analytical thinking ability and their performance in both tends to be strong.

**Take-home Message:** A high stakes summative structured clinical oral examination in Internal Medicine has demonstrated that content specific ability influences clinical reasoning ability in clinical clerks.

#7EE12 (630)
Less is more: Restructuring a clinical reasoning and differential diagnosis course for 5th year medical students

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**Background:** Clinical reasoning and differential diagnostic thinking are essential skills for future doctors. Our 5th year students were taught clinical reasoning in a class of 140 hours with ex cathedra lectures being predominant. Due to constantly decreasing evaluation scores to a minimum of 6.8 out 15 points change was warranted.

**Summary of Work:** First, lectures were reduced from 140 to 60 hours which gave more space for self-study. Second, learning objectives were aligned according to the National competency-based catalogue of learning objectives (NKLM). Third, faculty members were advised to encourage student engagement by including clinical cases and fostering interactive discussions.

**Summary of Results:** Attendance during the lectures increased and remained on a high level throughout the whole course. Comments of the students pointed out that overall student satisfaction rose considerably compared to the prior course concept. The new course received a total score of 9.3 points out of 15 in the general evaluation.

**Discussion:** Initially, faculty members were resistant to reduce and to restructure redundant lecture content. Political aspects such as defending one’s teaching time as a symbol of importance had to be overcome. We argued that enhancement of student participation will rise attendance. Implementing time for self-study will foster a better learning environment.

**Conclusion:** Direct feedback from the students indicated that the free time gained was mainly used for preparation and refining the lessons. The students found the new lecture structure very helpful. The element of interactive discussions led to a higher understanding of the subject.

**Take-home Message:** A better understanding of clinical reasoning was promoted by encouraging students’ participation during the lessons. Students benefited from loosening the formerly very dense timetable so that restraints from self-directed learning were abolished. Moreover, faculty members were pleased with the actual constant high numbers of students attending the lectures.
#7EE13 (198)
Tactfully Teaching the Teachers – a distributed model for teaching Critical Thinking

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Background: Dalhousie University emphasizes Critical Thinking skills as a longitudinal theme in the undergraduate medical education curriculum. In order to alleviate faculty concerns around their competence and confidence in teaching and assessing these skills, the Teaching and Assessing Critical Thinking (TACT) program was developed.

Summary of Work: The program allows a distributed group of clinical faculty to access content and interact with instructors (including postgraduate trainees) via online modules, in addition to live webinars and chat forum sessions. Learners are guided through various aspects of the fundamentals of Critical Thinking over the 12 weeks of the program.

Summary of Results: The initial program was highly successful, with positive high evaluations, leading to a further three iterations and expansion to allow non-Dalhousie faculty to participate across a variety of sites, including the UK and USA, and non-medical teachers to participate. A total of 48 participants have completed the program to date.

Discussion: Asynchronous learning is highly effective in developing skills and confidence in teaching Critical Thinking. Participants have completed four iterations of the program, with an advanced Part 2 being held for successful graduates of Part 1. Ongoing assessment will continue to inform development of future programs.

Conclusion: We describe a successful online program which employs principles of adult learning to train clinical faculty in the fundamentals of teaching and assessing the domain of Critical Thinking. This flexible and focused program is accessible to a range of clinical teachers across multiple locations.

Take-home Message: Clinical teachers can be effectively taught via asynchronous educational modules. We developed an online program that focuses on fundamental Critical Thinking skills, which we will continue to refine as we evaluate the program. We have expanded our participation to locations and clinical professions outside our initial Faculty of Medicine audience.

#7EE14 (1731)
Investigating Scientific Reasoning and Argumentation in Medical Education and Beyond

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Background: Scientific reasoning and argumentation (SRA) is a key qualification students are expected to obtain during university studies (Fischer et al., 2014). The aspects of SRA that are domain-general remain unclear and empirical research regarding teaching concepts and methods to foster the according skills, specifically in medical education, is also unsatisfactory.

Summary of Work: Within the research project ForschenLernen, three studies with different methodologies are currently being conducted to clarify the conditions under which SRA skills may best be fostered. Research-based learning and inquiry learning appear to be particularly promising approaches to support students in the acquisition of these skills (Mieg & Lehmann, 2017).

Summary of Results: (1) The interplay between SRA and epistemic beliefs is subject of a meta-analysis. (2) A quantitative 2X2 study aims to measure SRA skills and compares the statistical literacy of medical students and pedagogy students. (3) A qualitative study with university teacher educators investigates their attitudes towards research-based and inquiry learning.

Discussion: With respect to medical education, clinical reasoning as a special form of SRA is a crucial skill for students that needs to be fostered. Our studies further address claims regarding the lack of statistical literacy in medical doctors (Gaissmaier & Gigenerzer, 2008) and seek to provide data for curriculum improvement.

Conclusion: The question of how to foster students’ SRA skills should be investigated not only in medical education but also across different domains and with different methodologies. A profound knowledge of factors influencing SRA is essential for the development of effective research-based teaching concepts that aim to foster precisely these skills.

Take-home Message: A broader empirical basis is urgently needed to better understand and foster SRA skills in the context of medical education along the development path of expertise and professional profiles.
#7EE15 (197)
To what extent do dental students engage with reflection in undergraduate clinical practice?

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**Background:** Contemporary dental curricula have a social responsibility to deliver authentic pedagogical approaches that optimise student preparation for professional practice. Reflection and reflective practice are acknowledged strategies that strengthen coherence of theory and practice through enhanced self-awareness and critical thinking. However, commentary on their utility in oral health programmes is limited.

**Summary of Work:** A mixed methods methodology was used to explore student engagement with reflective activity. In particular, the impact on learning and transition into the clinical environment of third year undergraduate dental students. Completion of a self-administered reflection questionnaire was combined with focus group inquiry.

**Summary of Results:** Data analysis identified positive student involvement with concepts and associated deeper approaches to learning. Clinical Educators were considered pivotal to the process as too the context of the reflective activity. Further, the perception that concepts are universal processes was challenged by analysis of the fabric and granularity of the phenomena.

**Discussion:** Whether undertaken individually or collectively, flexibility in approach, establishing trust and promotion of a safe environment in which to undertake reflective activities are imperatives. To de-emphasise their criticality will undermine the experiential learning that reflective skills afford and debase desired principles of lifelong learning.

**Conclusion:** The precepts of reflection and reflective practice are complex and challenging to qualify and quantify. This study contributes to the ongoing dialogue from an oral health perspective through identifying engagement with the concept and impact on approach to student learning. This affords potential through further constructive and progressive exploitation.

**Take-home Message:** Innovative and unequivocal articulation of appropriate frameworks and tools, that compliment traditional discipline specific approaches, are indicated for a generation of students exposed to unlimited technology and knowledge. This will facilitate attainment of desired learning objectives whilst minimising the potential for concepts becoming overused and undervalued teaching strategies.

#7EE16 (1562)
Enhancing Reflection in Medical Students by Chat Application

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**Background:** The process of reflection is powerful for lifelong learning and achieving higher levels of professional medical practice. Although there are many different approaches to implement reflection in medical education, but low engagement and lack of integration in teaching and learning are still problems.

**Summary of Work:** Three medical students, extern, resident and staff/mentor together created a reflection group chat via LINE application during internal medicine rotation. Before bedtime, everybody was challenged to reflect any learning points, thoughts or problems by typing text in group chat. Staff/mentor was a key person to facilitate team and give feedbacks.

**Summary of Results:** All six questionnaires were responded with one-third did not know reflection before. Reflection group by chat application were rated 4.2 (max=5) for both satisfaction score and this activity should be maintained. They were motivated to review medical knowledges or learning points in everyday and sometimes felt no privacy to share.

**Discussion:** To improve professional medical practice for undergraduates, reflection is an important part. Social chat application is user-friendly for 21st century students and easily to be engaged. Moreover, they are able to learn each other and staff/mentor can teach or give some feedbacks anytime. Privacy is only limitation for this activity.

**Conclusion:** Reflection group by chat application can be a tool for enhancing reflection process in medical students.

**Take-home Message:** Anyone can do reflection anytime in any hands.
Gender specific linguistic analysis of reflective writing of undergraduate medical students

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Background: Reflection forms an integral part of professional medical practice. We teach undergraduate students how to reflect during a one-week teaching skills course and this includes a written reflective exercise on something having a personal impact during the week. Our impression is that females use emotional language more frequently than males.

Summary of Work: We have investigated gender differences in use of language for the reflective work of 332 students (158 female). Using a software programme Linguistic Inquiry Word Count (LIWC2015) we analysed language within six psychological process word categories: social, affective, cognitive, perceptual, drives and time-orientation and additional subcategories.

Summary of Results: Cognitive words were most frequent; affective and perceptual categories were least frequent. Females had significantly higher word counts than males (p=0.001), and females were more likely to express anxiety (p=0.002), mention friends (p=0.008), certainty (p>0.019) and affiliation (p=0.036) compared to males.

Discussion: Use of emotional words was low between both sexes despite the relevance of ‘feelings’ to meaningful reflection. There are limitations of using a word count approach to inferring emotional content, however, as the LIWC2015 does not allow for contextual use of language. Some highly significant gender differences require further analysis.

Conclusion: Our data suggests a need for our teaching to develop to encourage written expression of feelings as well as thoughts. Interpretation of gender specific differences in word usage needs further qualitative analysis to identify meaningful gender differences in expressing thoughts and feelings, which can be used to inform our teaching.

Take-home Message: We have identified trends in word usage, which may indicate trends in approach to reflective writing. We have also identified significant gender differences in word use. Further qualitative analysis, which includes language context, will be necessary to clarify whether our data reflects meaningful gender differences in approaches to reflective writing.

Choosing Wisely in Medical School - as Soon as Possible

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Background: It is very important to increase awareness towards high-value, cost-conscious medical decisions. In this context, it was created the Choosing Wisely international campaign. In Brazil, the list creation strategy has been applied to a specialty medical society, but participation of undergraduate medical students has not been described so far.

Summary of Work: A 12-item list of recommendations was created by an expert panel of 10 medical teachers. This list was applied to 93 pre-clinical medical students, to choose the most relevant items. Later, we promoted an event to discuss this topic. This intervention was evaluated by the students using a questionnaire.

Summary of Results: Six items were chosen as the most relevant. Those related to “shared-decision making” and “benzodiazepine prescription” were the most important. The main choosing criteria was “previous experience as a patient” and most of the students agreed about the importance of the campaign, on which cost-benefit was the perceived theme.

Discussion: The “shared-decision making” item and the main choosing criteria represent how the students relate more to the role of the patient than to the doctor. That is expected, once they are in pre-clinical phase and lack experience.

Conclusion: It is possible to raise medical students awareness about high-value medical decisions using the same strategy as the Choosing Wisely campaign.

Take-home Message: To include cost-consciousness themes in medical school curricula it is essential to improve the quality of our doctors.