

Evidence Live 2018 Oral Abstracts

Tools and concepts that are basic and central to the teaching and practicing of evidence-based medicine / Building capacity
16:00 Tuesday June 19th

The application of EBM Club in standardized resident training in China

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Objectives: The standardized resident training program in China focuses on training of clinical skills now. However, training of evidence-based practice is becoming more and more important for residents. The purpose of this study was to investigate the effect of EBM Club on EBM teaching to residents.

Method: The EBM Club was established among the residents who were enrolled in the standardized resident training program in our department. Clinical scenarios were described according to real cases in practice and clinical questions were raised. Corresponding literatures were given to the residents for review and critical appraisal. Answers to the following questions were discussed among EBM club members. Were the results valid? What were the results? Could the results be applied to our patient? Feedbacks were provided by the teachers who lead the club. The effect of EBM Club on EBM teaching was evaluated by both the supervising board of the EBM center and survey among the participant residents.

Results: It was shown that the EBM Club could help the residents understand concepts of evidence-based medicine, grasp steps of evidence based practice, master methodology of critical appraisal, and improve the ability to do clinical research. EBM Club was considered as a practical, student-centered and time-fitting approach to teaching EBM among residents.

Conclusions: EBM Club is an effective approach to EBM training in residents. It enriches contemporary standardized resident training in China.

Restricted meta-analyses versus full meta-analyses: threshold number of studies based on study sample size

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Objectives: Systematic reviews and meta-analyses are well established as the highest level of evidence in health care, but can be costly in time, money and labour. Meta-analyses have historically advocated 'more is better' to approximate the true effect. However, restricting the number of studies in meta-analyses would reduce the time taken to do a review. It has been suggested that sample size is an adequate indicator of effect estimate and larger studies have estimates closer to the true effect. This research's objective was to generate a minimum threshold number of studies based on study sample size, to use in meta-analyses without comprising their overall conclusions.

Method: Using a derivation dataset from the Cochrane library, meta-analyses were ranked by sample size. Pooled estimates for the individual meta-analyses were recalculated to obtain a threshold number of larger studies (study sample size) where the change in the effect estimate 95% confidence interval width had stabilised and was minimal. This threshold number of studies was tested for concordance between the original meta-analysis and the restricted meta-analysis in a validation dataset of meta-analyses. Comparisons were made between the paired meta-analyses using two methods: levels of agreement in direction of effect and statistical significance, and correlation of effect estimates.

Results: The research suggests where studies are ranked by study sample size, nine studies are sufficient to draw the same meta-analysis conclusion in terms of total agreement between restricted and the original meta-analysis 80% of the time. Correlation of the effect estimates was 0.96. Where restricted meta-analysis results are statistically insignificant caution should be taken as there may be a higher chance of disagreement between the paired meta-analyses.

Conclusions: This research adds to the body of evidence that supports the view that it is possible to use restricted meta-analyses without jeopardising the integrity of the final findings for a given research question.

Being part of advanced research to instill a working knowledge of critical appraisal and research methods in a group of medical students as an educational objective – the experience of one professor in a state university in Chile

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Objectives: To achieve a deep knowledge and a positive attitude towards research methodology, reporting standards and research integrity, in a group of seven medical students attending a state university in Chile. The aim of this learning and applied activity was to pick up from the evidence-based medicine course and follow through by engaging the students in complex research projects from inception to publication of results.

Method: After finishing the EBM course in medical school, 85 medical students recently introduced to clinical courses in hospital, were offered the opportunity to participate in two research projects. Seven students signed up to become research assistants to the Associate Professor of Evidence-Based Medicine of Universidad de Santiago de Chile (USACH). The professor provided a couple of research ideas - one on reporting guidelines and clinical trials, and one on research integrity and publication ethics. During the latter half of the academic year, weekly three-hour sessions were scheduled to plan, conduct and report the results of the research projects. Follow-up of assigned tasks and responsibilities was carried out through Basecamp, an online project management application. Group discussion was horizontal and conducive towards advancing in the knowledge dimension, but was always guided by the lead professor. Other professors were invited to join the discussion on an ad-hoc basis.

Results: The students were initially divided into two groups with lead student investigators per group. All were actively involved from the start in the discussion of the research question and design, study objectives, methods, data extraction, analysis and drafting of protocols and manuscripts. Likewise, they participated in writing and submitting the funding proposals, and they have contributed to drafting the

protocol manuscripts. Two of the students gave oral presentations in research student meetings. Discussions are held both in Spanish and English, which is also helping them with their English skills. Manuscripts are drafted, revised and corrected in English. In the knowledge process dimension, the students have been able to successfully acquire and construct factual knowledge, conceptual knowledge, procedural knowledge and metacognitive knowledge. In the cognitive process dimension, the students are actively prompted to understand the research process, as well as apply, analyze, evaluate and create during the conduct of both projects.

Conclusions: The projects are providing the students with critical appraisal skills, and knowledge about publication ethics and research integrity. We expect that at least four publications in top international journals will result from these projects. While most research conducted by medical students in Latin America is descriptive and usually concerns case reports, our experience shows that medical students are able to raise the bar in the type of research they are engaged in, and make important and intelligent contributions to the process. Academic leadership and mentorship, as well as institutional support, appear to be fundamental for the success of this experience.

Building capability, leadership and a home for Evidence based Medicine in Ireland

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Whilst the EBM movement and the approach to putting evidence into practice has grown throughout the world, its adoption in Ireland has been somewhat fragmented, with no unifying network to connect the practitioners, educators and students of EBM.

Our aim is to establish a hub for evidence based medicine in Ireland and to promote evidence based practice throughout the healthcare system in Ireland, with the ultimate goal of improving patient outcomes.

Objectives:

- To create a hub for EBM in Ireland through the establishment of Evidence Based Medicine Ireland (EBMI)
- To build capability and leadership for EBM in Ireland
- To establish a network of EBM practitioners
- To establish a network of EBM educators
- To create international links and access to world class experts in EBM

Method:

- Baseline research on current EBM teaching in Ireland, including literature review, interviews with international experts and a national survey with third level institutions.
- Stakeholder engagement on the development of a competency framework for EBM education for health professionals in Ireland.
- Training of EBM trainers at CEBM Oxford.
- Training in EBM for healthcare staff, in conjunction with CEBM.

There is a focus on capacity building, sustainability, identifying change agents and implementation of evidence into practice. The establishment of EBMI will commence with the development of a network of practitioners and educators identified through the EBM workshop held in November 2017.

A grant was awarded by the Naji Foundation for training and capacity building. The Naji Foundation is dedicated to promoting evidence-based healthcare and informed healthcare choices and aims to support activities and research that increase the use and understanding of evidence in healthcare.

Results:

- Publication of baseline research of EBM teaching in Ireland (UCC 2017), which showed positive attitudes towards EBM. The research showed that the first three steps of EBM (ask, acquire, appraise) were taught more frequently in Ireland than steps four and five (apply, assess). A named EBM lead/champion was not identifiable within the majority of institutions.
- 3 day training provided to 50 healthcare professionals in November 2017 on 'introduction to evidence based practice' in collaboration with the CEBM.
- Core group of health professionals identified to commence establishment of a network of both EBM practitioners and educators in Ireland.
- EBM Education Forum held with educators, regulators and accreditation bodies in 2016 and 2017.
- Research commenced in 2018 on the development of a competency framework for EBM education in Ireland.

Conclusions: This project addresses the current lack of standardised EBM education, training and practice in Ireland. EBMI will provide a hub for education, collaboration and dissemination with a multidisciplinary group of health professionals working in the Irish health system. The network aims to build a future network of EBM advocates and will maintain strong links with the international EBM community.

Through dissemination and translation of evidence into practice, this innovative national initiative will enhance our ability to communicate, translate and exchange information to make a real difference in health care.

Teaching of Evidence-based Medicine in Italian medical schools: a systematic analysis of courses and syllabi

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Objectives: Medical schools worldwide have increasingly included EBM principles in undergraduate curriculum either in different courses or in one specific course. In Italy complete and systematic data on EBM teaching in medical schools are lacking. Indirect information comes from a survey conducted by GIMBE Foundation on more than 600 students who applied for a scholarship to acquire Evidence-based

Practice core curriculum. Most of respondents outlined that EBM is mainly taught in occasional lectures or seminars, without any searching and/or critical appraising of literature. In 2017 GIMBE Foundation assigned a research grant to the Italian Secretariat of Medical Students (SISM) to evaluate teaching of EBM in medical schools and assess the real implementation of syllabi through structured surveys among students.

Method: The first phase of the study has been developed in 4 steps. Step 1: identification and inclusion of all Italian medical degree courses, excluding English taught ones. Step 2: detection of information sources to analyze, namely the core curriculum designed by the Italian Council of Medical Deans, the core curriculum of each medical school, medical schools' annual return ("Scheda Unica Annuale – SUA") and syllabi of single courses. Step 3: keywords identification. A high sensitive strategy has been used, searching each document for the following keywords: "medicina basata", "evidenza", "evidenze", "evidence", "letteratura", "prove di efficacia", "EBM". Step 4: data entry. Occurrences have been recorded in a database including the following fields: medical school and degree course, keyword (present, absent, not relevant, SUA section where keyword occurred, SUA page number where keyword occurred, sentence where keyword occurred, specific EBM course (yes/no). Duplicate and not relevant records have been excluded.

Results: 40 eligible medical schools were identified, with a total of 46 medical degree courses. At this stage of the study only the core curriculum of both the Italian Council of Medical Deans and single Medical Schools as well as SUA have been analyzed. Syllabi of single courses will be examined in the next months. The core curriculum of the Italian Council of Medical Deans includes all components of EBM core curriculum in its elementary teaching units (even if not structured). As for the single medical schools, only 4 core curricula have been retrieved and therefore they have been excluded from further assessment and analyses. In medical schools' annual return (SUA) only 8 degree courses with a specific EBM course were identified; there is a variable keywords' occurrence in SUA of different degree courses (mean $3.8 \pm SD 2.6$, range 1-11)

Conclusions: Although educational aims reported in the elementary teaching units of core curriculum of the Italian Council of Medical Deans are coherent with EBM core curriculum, SUA only occasionally include EBM. The 8 EBM specific courses identified in SUA seem to be due more to local initiatives rather than resulting from a systematic introduction of EBM in the Italian undergraduate medical education.

Making research evidence relevant, replicable and accessible

16:00 Tuesday June 19th

The Academic Surgical Collaborative: A three-year review of a Trainee Research Collaborative

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Objectives

1. Highlights the progress of the ASC three years on.
2. Describes the achievements of the collaborative to date in relation to its original objectives, and its future aims and goals.
3. Described what has been learnt and may inform both the establishing and established research collaboratives.

Method: Retrospectively looking at the achievements (publications, presentations, awards and posters) of the ASC.

Detailing the demographics of the ASC and how this has changed over the 3 years.

Results: As of September 2017, of 62 members, 36 were medical students (58%) (30 in their clinical years of university), 11 were Foundation Doctors (18%), 4 junior trainees (6%), 4 Specialist Registrars (6%), 6 Clinical Research Fellows (10%) and an Associate Professor (2%). The ASC membership are largely UK based but the ASC has attracted active co-authors from abroad including Italy and Australia.

The ASC has grown exponentially, having achieved 33 publications, 56 national presentations and 8 National Prizes (as of September 2017).

Conclusions: In three years the ASC has established itself as a productive TRC and fulfilled the aims set out at its inception. The above article highlights learning points that may guide other collaboratives. We welcome their input in turn to further cultivate a community of ongoing collaborative research in the future.

What can ethics committees do to promote the REWARD statement and reduce research waste?

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Objectives:

- 1) To describe how research ethics committees can use information gathered during the review process to support researchers and help reduce research waste.
- 2) To describe the role and activities of the REWARD Alliance's regulation and governance working group

Method: A description of activities justified by quantitative data and analysis.

Results: UK research ethics committees are able to gather critical data about all clinical trials being conducted in the NHS. This data spans institutions, sponsors and funders, providing an almost complete picture of human participant medical research being conducted in the UK. By supporting and interacting with researchers they are able to intervene at a relatively early stage of the research process to ensure that studies are well designed, have suitable dissemination plans, contribute to medical knowledge and are cognisant of the REWARD principles.

Conclusions: Research ethics committees are uniquely placed to monitor and try to prevent research waste before studies have even begun. By making researchers aware of the REWARD statement, and helping them design research that meets the REWARD criteria, they are well placed to support the goals of evidence based medicine.

Increased risks for false-positive or false-negative findings are common in outcomes graded as high certainty of evidence

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Objectives: We aimed to assess the risk for random errors in outcomes graded as high certainty of evidence (CoE).

Method: We randomly selected 100 Cochrane reviews, that reported at least one dichotomous outcome rated as high CoE according to GRADE (Grading of Recommendations Assessment, Development, and Evaluation). To detect increased risks for random errors, two investigators independently conducted Trial Sequential Analysis (TSA) for one high CoE outcome per review. In TSA we employed conventional thresholds for type I ($\alpha = 0.05$) and type II ($\beta = 0.10$) errors. We dually re-graded all outcomes that showed an increased risks for random errors and conducted multivariate logistic regression analyses to determine predictors of increased risks.

Results: Overall, 38% (95% confidence interval: 28% to 47%) of high CoE outcomes had increased risks for random errors. Outcomes measuring harms were more frequently affected than outcomes assessing benefits (47% vs. 12%). Re-grading of outcomes with increased random errors showed that 74% should not have been rated as high CoE based on current GRADE guidance. Regression analyses rendered small absolute risk difference ($p = 0.009$) and low number of events ($p = 0.001$) as significant predictors of increased risks for random errors.

Conclusions: Decisionmakers need to be aware that outcomes rated as high CoE often have increased risks for false-positive or false-negative findings.

IDEAL-Physio: A new tool guiding innovation and evaluation of complex interventions and enacting the EBM-Manifesto in Physiotherapy.

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Objectives: IDEAL-Physio, developed from the IDEAL framework, is a new tool fulfilling key aspects of the EBM manifesto in complex interventions such as physiotherapy. Research in physiotherapy has flourished, with 24,236 clinical trials and systematic reviews added to the Physiotherapy Evidence Database between 2004-2016, but study quality, reproducibility, and relevance to patients and end-users varies widely and clinical practices with poor or no evidence continue to proliferate. The IDEAL-Physio framework seeks to improve this, proposing that innovation and evaluation in clinical practice should evolve together in an ordered manner, from conception to validation by appropriate clinical trials. This sequential, practicable framework supports an innovation pathway that is transparent, fosters quality improvement, and expands the role of patients and practicing clinicians in healthcare research. IDEAL-Physio helps bridge the gap between clinical practice and academic research, facilitating clinician participation in evidence-gathering and development, and encouraging the next generation of leaders in evidence-based healthcare.

Method: The Ideal-Physio framework has five stages; Idea (1), Development (2a), Exploration (2b), Assessment (3), and Long-term study(4). Each stage has stage-specific methodological recommendations and research reporting guidelines. Research items fit within this ordered structure, helping to provide an evidence-based introduction of innovation and a transparent method of evaluating existing treatments in the context of patient-centered, evidence-based care. IDEAL-Physio advocates careful monitoring, documentation, and incorporation of patient and clinician experiences and responses to the intervention, facilitating the development of clinical practices of greater relevance to patients and end-users. Determination of whether interventions are safe, efficacious, and worthy of further use (or study) in the early IDEAL-Physio stages improves the quality of patient care and reduces research waste. Ideal-Physio encourages early, structured and systematic data collection using appropriate outcome measures. It also facilitates documentation of all modifications made in the development and implementation of the intervention, facilitating transparency and research reproducibility.

Results: The IDEAL framework is successfully embedded in the surgical sciences and the medical devices field. It's latest adaptation, IDEAL-Physio, was developed to reflect the multifaceted nature of physiotherapy as a similar, practitioner-based complex intervention. The IDEAL-Physio framework was recently published in the February 2018 issue of "Physical Therapy," the Journal of the American Physical Therapy Association. Clinical trials of innovative physiotherapy practices, guided by the framework, are currently underway in the United States. It is also being used as a framework for introducing concepts in evidence-based health care and the development of clinical trials by students in a doctoral program in physiotherapy for practicing clinicians at Northeastern University in Boston, Massachusetts. IDEAL-Physio is making important contributions to patient safety and ethical practice by helping to address the current

lack of rigorous evaluation and data for many clinical practices that risks patient safety and ultimately reduces patients' autonomy and informed decision-making.

Conclusions: An aging population, growing numbers with chronic diseases, and increasing emphasis on physical activity are increasing the demand for physiotherapy and other complex interventions. The need for new and existing practices that are evidence-based and patient-centered is pressing. Practicable, specific recommendations to guide rigorous evaluation of clinical practices and empower clinicians to become active participants in improving the body of evidence and quality of patient care are greatly needed. These, and other key elements of the EBM-Manifesto can be promoted in physiotherapy by IDEAL-Physio, which can also serve as a model for evidenced innovation in practice in other complex interventions.

How Fragile is the Evidence Base? A Meta-Epidemiologic Study of the Fragility Index Derived from 374 Randomized Trials

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Background: Recently, there has been increasing interest in addressing the problem of over-relying on threshold p values. Using $p < 0.05$ represents a blunt arbiter of conclusions that are fraught with false positives and false negatives. Furthermore, questionable research practices are sometimes used to “game” the p-value threshold in order to support the researchers' preferred conclusions.

Tools to highlight p-value shortcomings are required to improve interpretation of p-values. The Fragility Index has been proposed as a tool to highlight the “fragility” of evidence derived from a threshold p-value.

Objectives: The primary objective of this study was to measure the fragility of conclusions from randomized trials (RCTs) published in the *New England Journal of Medicine* using the Fragility Index. Secondary objectives were to estimate the added impact of losses to follow-up on fragility, and to measure correlation between Fragility Index and standardized effect size, sample size, total number of events, and publication year.

Method: All RCTs of established practices that were published in the *New England Journal of Medicine* between 2000 to 2016 were included if they met the following criteria: (1) reported a dichotomous primary outcome; (2) had only two comparison groups; and (3) used a 1:1 randomization scheme. Data was extracted from each RCT in duplicate.

The Fragility index was calculated by converting one patient in the group (control or experimental group) from a "non-event" to an "event" outcome and recalculating a two-sided Fisher's exact test until the p-value meets or exceeds 0.05. This Fragility Index was calculated for trials with a significant primary outcome using a Fragility Index calculator, and the reverse Fragility Index for all trials with non-significant ($p > 0.05$) outcomes using an R package. Loss to follow up was measured. Univariable linear regression was performed to assess the association between prespecified trial characteristics and the Fragility Index.

Results: Of 611 RCTs published in the New England Journal of Medicine between 2000 and 2016, a total of 374 met the inclusion criteria. The median Fragility Index was 7.5 (range 0 to 141). One-quarter of the trials had a Fragility Index of 3 or less. The number of patients lost to follow-up exceeded the Fragility Index in 66% (247/375) of the RCTs, indicating that the true Fragility Index would be even lower than reported if corrected for losses to follow-up. The Fragility Index was moderately correlated with the standardized effect size, and weakly correlated with sample size and year of publication. Sensitivity analyses did not reveal material differences when accounting for missing data.

Conclusions: Conclusions from RCTs that are based on p-values are very fragile, with a median of fewer than 8 additional events required to change the conclusion from significant to non-significant (or vice-versa). More than one-quarter of all trials would require only 3 additional events to change the conclusion. Furthermore, the majority of trials had a loss to follow-up that exceeded the Fragility Index, indicating that the results would be even more unstable if the Fragility Index was corrected for losses to follow-up. Efforts to increase awareness of the fragility of conclusions based on p-values is urgently required.

The assessments of three different dimensions “Efficacy”, “Effectiveness”, and “Value” require three different tools: the Randomized Controlled Trial (RCT), the Pragmatic Controlled Trial (PCT), and the Complete Economic or Cost-Effectiveness Analysis (CEA) .

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Sir Archie Cochrane and Sir Austin Bradford Hill requested to answer three short questions before implementing a new healthcare service into daily clinical practice: **CAN IT WORK? DOES IT WORK? IS IT WORTH IT?** For implementation of this 3-step-CDI-strategy we propose the consecutive completion of three different types of studies.

First, a Randomized Controlled Trial (RCT) to confirm that it CAN WORK, i.e. to demonstrate efficacy under Ideal Study Conditions (ISC). Second, a Pragmatic Controlled Trial (PCT) to confirm that it DOES WORK, i.e. to demonstrate effectiveness under Real World Conditions (RWC). Third, a Complete Economic or Cost-Effectiveness-Analysis (CEA) to demonstrate that IT IS WORTH IT, i.e. to demonstrate the value [needless to say] under RWC from the patient and the societal perspectives.

Unfortunately, there is no consensus on the appropriateness of different tools (RCT, PCT, CEA) for assessment of different effects (efficacy, effectiveness, value) under different conditions (ISC, RWC). It should be not too difficult to define ISCs and RWCs and to describe the effects that can be described under either ISC or RWC but probably not in between. Both the conditions and the interventions under these conditions can be distinguished clearly by five criteria. The goal of the intervention, the respect of patient autonomy, the legitimized application of the intervention, the application of not legitimized interventions, and finally the value generated by the intervention.

These details will be presented in four tables. First, the tree requests of Sir Archie Cochrane and Sir Austin Bradford Hill. Second, the 3-step-CDI-approach we propose. Third, the description of differences of efficacy, effectiveness, and value, and fourth, the detailed differences in the 14 steps of a RWC, PCT or RCT. The function of this 3-step-CDI-approach is a prototype of the more practicable ICE-3-step-tool that will be ready for presentation by autumn 2018.

The effects of communicating uncertainty about facts and numbers

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Objectives: Uncertainty is an integral part of science, statistics, and measurement and yet researchers, clinicians and journalists often worry that attempting to communicate uncertainty about scientific facts and numbers will only serve to decrease trust and undermine credibility.

However, the effects of the communication of uncertainty – even epistemic uncertainty, around past and present facts and numbers – remains little studied. We are currently undertaking a set of experimental studies to test under what conditions communicating uncertainty about numbers and facts does, and does not, influence comprehension and trust.

Method: We are currently conducting online experiments comparing different forms of uncertainty communication (no uncertainty, a verbal statement that there is some uncertainty around the estimate, and a numerical range), on different topics (in our pilot study: UK unemployment, the number of tigers in India, and an estimate of global warming).

We are measuring people's reaction to this communication both in terms of their feeling of uncertainty around the number, their trust in the number, and their trust in the source of the number.

We also collect demographic information about the participants including their numeracy and educational background.

Results: As might be expected, the results of our first pilot experiment showed that across all topics people perceived estimates about which uncertainty was communicated as more uncertain than when no uncertainty was communicated. This effect was stronger for verbal uncertainty communication than when a numerical range was presented.

In addition, people perceived estimates about which uncertainty was communicated as less reliable and trustworthy, but mostly so for verbal uncertainty communication - the effects for numerical uncertainty communication were small.

Interestingly, the communication of uncertainty through a numerical range created no decline in trust in the source of the numbers. This indicates that people distinguish between the numbers themselves and the source in their judgments: whereas the *numbers* were seen as less trustworthy, in the case of numerical uncertainty communication the trustworthiness of the *source* was unaffected.

There were no significant moderating factors in terms of demographics or numeracy.

Conclusions: Our initial pilot study results provide a first indication that communicating uncertainty does affect people's interpretation of numbers and of the organization or source behind it. We plan further experiments imminently testing the influence of the magnitude of uncertainty, more variations of numerical and verbal forms of communication and then also graphical formats.

After those experiments, we plan further testing in real-world settings (eg. online news websites, with patients) and with different audiences to test the generalisability of the conclusions.

Effect Of Early Surgery In Elderly Patients With A Hip Fracture: Systematic Review And Meta-Analysis

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Objectives: The effect of early surgery in elderly patients with hip fractures has been controversial during the last five decades due to equivocal evidence both in favour and against it. The objective of this study was to systematically assess all the available evidence on the effect(s) of early surgery compared with delayed surgery in elderly patients with hip fractures.

Method: A systematic review and meta-analysis was conducted. Searches for randomised controlled trials (RCTs) or prospective observational studies were conducted from inception to July 2017 in the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE (OVID), EMBASE (OVID), and they were complemented with list of references searching, review of both clinical trials registers and archives of orthopaedic meetings. Two reviewers independently selected studies for inclusion, extracted data and evaluated risk of bias; and a third reviewer resolved discrepancies. Risk ratios (RR) were calculated for dichotomous data, and mean difference (MD) or standardised mean difference (SMD) was calculated for continuous data. The quality of evidence was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.

Results: 39 studies were included with 51,857 participants (range of mean age: 74 to 93 years). Three studies were RCTs and 36 were observational studies (OBS). The evidence from RCTs and OBS showed that early surgery reduces risk of all-cause mortality (RR 0.73, 95% confidence interval (CI) 0.64 to 0.82; I^2 64%; low quality of evidence (LQE)). OBS showed reduced risk of all-cause mortality when surgery is performed within the first 48 hours upon hospital admission (RR 0.71, 95% CI 0.61 to 0.81; I^2 58%; very LQE). OBS also showed a reduction of complications (RR 0.61, 95% CI 0.51 to 0.73; I^2 64%; very LQE) and pain (RR 0.89, 95% CI 0.67 to 1.17; I^2 0%; very LQE). RCTs showed that early surgery reduces length of stay (MD -6.73, 95% CI -12.92 to -0.54; I^2 54%; very LQE) and improves functionality (SMD 0.32, 95% CI 0.04 to 0.59; I^2 5%; LQE)

Conclusions: Low-quality evidence showed that early surgery reduces all-cause mortality at 6 and 12 months post-surgery, especially when it is performed during the first 48 hours after hospital admission. There was very low-quality evidence of a reduction in complications including pneumonia and pressure sores, and low-quality evidence for a reduced risk of urinary tract infection for early compared with delayed surgery. Reductions in length of hospital stay and improvement of postoperative functionality with early surgery were also observed but with very low- and low-quality of evidence respectively. There was very low-quality evidence for no effect of early surgery on postoperative pain.

The effectiveness of Student 4 Best Evidence as a tool to improve Evidence-Based Practice competencies in undergraduate health professional students: a pilot study

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Objectives: Evidence-based practice (EBP) is an essential element in the delivery of high-quality care and healthcare professionals make clinical decisions based on the best available research. Experts and international organizations have emphasized the need for healthcare professionals to possess adequate competencies for EBP. An EBP learning laboratory has been established at an Italian university to educate medical and other health professional students in the use of evidence in clinical practice and research. Students 4 Best Evidence (S4BE) is an online community of students from around the world, from school age to university, who are interested in learning more about EBP. As well as featuring a library of learning resources, the site also provides a platform for students to write their own blogs.

The aim of this study is to evaluate the effectiveness of an EBP laboratory, using S4BE as an educational tool, to teach EBP competence to undergraduate students of Physiotherapy.

Method: We are running an observational pretest-posttest study. The sample includes 90 students completing a bachelor's degree in Physiotherapy at an Italian University. The intervention consists of the use of S4BE to teach EBP competence. The evidence-based practice questionnaire (EBPQ) is being used to evaluate EBP attitude, knowledge, skills, and practice before the intervention, and at 3 months following the intervention. An intra-group analysis will be conducted.

Results: The study is still ongoing with final data collection to be performed in March 2018: the results will be provided during the Evidence Live Conference 2018.

Conclusions: This observational study will provide evidence regarding the effect of S4BE, as an educational intervention to teach EBP competencies. The hypothesis is that engagement with S4BE will lead to improvements in students' skills and understanding of EBP during their clinical training.

Disclosing the results of clinical trials: how is the pharmaceutical industry doing?

Slavka Baronikova¹, Jim Purvis², Christopher Winchester², Eric Southam², Julie Beeso², Antonia Panayi¹

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Objectives: To evaluate disclosure of clinical trials registered by pharmaceutical companies using an independent, semi-automated tool (TrialsTracker; <https://trialstracker.ebmdatalab.net/#/>).

Method: For the top 50 pharmaceutical companies (2014 global sales; EvaluatePharma, London, UK), registered interventional phase 2–4 clinical trials completed in 2006–2015 were identified in TrialsTracker, which calculates annual disclosure rates for sponsors of over 30 studies registered on ClinicalTrials.gov. The proportion of trials with results disclosed by April 2017 was analysed by company membership of the

European Federation of Pharmaceutical Industries and Associations (EFPIA) and Pharmaceutical Research and Manufacturers of America (PhRMA).

Results: In total, 323 clinical trial sponsors were listed in TrialsTracker, of which 69 were pharmaceutical industry sponsors and 31 were ranked in the top 50 pharmaceutical companies. Of these, 25/31 were EFPIA/PhRMA members and 6/31 were non-members. The disclosure rate for each year from 2006 to 2015 was 42.9%, 54.4%, 81.0%, 86.1%, 84.6%, 87.2%, 89.3%, 82.1%, 84.1% and 73.4%; reporting of clinical trial results became mandatory in 2008. The disclosure rate (disclosed trials/eligible trials) between 2006 and 2015 was greater for all pharmaceutical industry sponsors (7037/9511 [74.0%]) than for non-industry sponsors (9074/19866 [45.7%]) ($p < 0.01$). For the top 50 companies, results were disclosed for 4761/6235 trials (76.4%) between 2006 and 2015, with similar disclosure rates for EFPIA/PhRMA members (4336/5697 [76.1%]) and non-members (425/538 [79.0%]).

Conclusions: According to TrialsTracker, the pharmaceutical industry has disclosed the results of three quarters of trials completed between 2006 and 2015. The disclosure rate for pharmaceutical industry sponsors is greater than for non-industry sponsors. Because TrialsTracker excludes sources other than ClinicalTrials.gov (e.g. company websites), this figure may be an underestimate.

Impact of bias (detection) on follow-on research: evidence from the medical literature

Rossella Salandra

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Objectives: Despite the scientific community's interest in detecting biased knowledge and the proliferation of systems to appraise the quality of scientific evidence, the impact of bias (detection) on future science is not clear. This study examines the role of the systems for grading the quality of evidence in signalling the existence of bias to the scientific community.

Method: The data for this study was derived principally from two sources: the Cochrane Database of Systematic reviews and SCOPUS. The Database of Systematic Reviews maintained by the Cochrane Collaboration was used to identify bias from the biomedical literature. Specifically, this study relies on a hand-collected dataset of clinical trials univocally paired to scientific publications, including the "risk of bias" rating from Cochrane reviews. SCOPUS was used to obtain detailed bibliometric information about each article. In line with prior literature (e.g., on retractions) to assess the causal impact of bias (detection) this study employs a matched-sample control group, pairing a sample of scientific articles from the biomedical literature (deemed at high risk of bias by Cochrane) with similar "unbiased" papers. Consistent with past studies, this analysis employs difference-in-difference estimation to quantify the impact of bias, comparing citation patterns for biased articles to those of a matched control sample.

Results: The preliminary findings suggest that the system of evidence appraisal provides important information to researchers and that bias detection effectively redirects research away from biased knowledge. In the main model specification, the impact of bias detection on citations is statistically significant, with annual citations of an article significantly dropping following bias (detection), controlling for article age.

Conclusions: Although this analysis is necessarily limited to a subset of studies and thus findings should be interpreted with care, this study supports optimistic assessments of evidence appraisal systems as mechanisms to alert the scientific community. When false knowledge is identified and signalled to the community via bias assessment in a systematic review, the signal leads to a long-lived decline in citations.

Increase the systematic use of existing evidence

16:00 Tuesday June 19th

Manual versus Machine-Assisted: A Case Study Comparing a Manual Systematic Literature Review to a Computer-Assisted Evidence Search and Synthesis Approach (EvidenceEngine™)

Gina D'Agostino¹, Mateusz Ollik², Ray Liu³, Zach Ferguson³

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Objective: Systematic literature reviews collate what is known on a topic to date and provide the current status of available evidence. Practitioners in a specific medical discipline may request a new search in order to verify their knowledge or to learn of new findings. A urology surgeon specializing in oncology requested that a cognitive computing model called EvidenceEngine™ complete a literature search, collection of studies, analysis, and interpretation of evidence on the research question, “Is adjuvant radiotherapy or salvage radiotherapy superior for patients who have undergone prostatectomy for prostate cancer?” To validate the findings of this novel machine-assisted search engine, a clinical nurse researcher conducted the same literature search and interpretation of findings via a manual, systematic review of the literature. The objective of this case study was to compare the results of these two search methods in answering the research question.

Method: A literature search, data collection, analysis and interpretation of digitally accessible full-text articles and abstracts published between 2011 and 2017 was performed by a machine-assisted tool called EvidenceEngine™. Each study was evaluated using a quantitative scoring methodology to determine its level of merit, based on the factors of study design, population size, potential conflict of interest, publication date and peer review status. An analysis of the results with regard to patient outcomes for post radical prostatectomy patients undergoing adjuvant radiotherapy (ART) versus salvage radiotherapy (SRT) was then performed to determine the overall direction of the evidence. The clinical nurse researcher was blinded to these results until the manual search was completed which consisted of the traditional steps of a systematic literature review including searching Medline, PubMed, and Scopus via multiple key words, recording, categorizing, reading, and analyzing pertinent articles within the date range, culminating in a summary of the evidence.

Results: The results and process for completion of these independent literature reviews were compared. The machine-assisted EvidenceEngine™ approach reached a quantitative score of 2.3/10 in favor of ART, indicating that the aggregate evidence is very weakly supportive of ART over SRT. The manual approach qualitatively reached the conclusion that neither ART nor SRT was definitively superior based on the evidence. Both the machine-assisted and manual approaches uncovered critical study limitations in the

evidence, including design flaws in the RCTs (e.g. comparison arms were essentially uncontrolled observation arms; variable inclusion criteria for PSA levels before randomization), although the machine-assisted approach required additional manual analysis of the report results. The manual evidence review was completed within forty-two hours over eight work days, while the machine-assisted approach consisted of a one-week waiting period for report generation, followed by a few hours of manual analysis.

Conclusions: While both methods reached the same conclusion, there are advantages and disadvantages of each method. The EvidenceEngine™ is capable of quantifying the direction of the evidence and the strength of each study, while the manual method qualitatively describes the evidence direction and the study strength by the researcher assigning a level of evidence score. The EvidenceEngine™ may be a more time efficient method as the researcher is presented with the relevant studies and their evidence quality scores, allowing more time for analysis and interpretation of results and limitations. Both methods utilized together enhance the systematic use of existing evidence.

Transforming evidence-based practice with CrowdCARE: Crowdsourcing Critical Appraisal of Research Evidence

Laura Downie, Michael Pianta

University of Melbourne, Parkville, Australia

Objectives: Evidence-based practice (EBP) is a dominant paradigm in healthcare that aims to deliver the highest quality patient care. EBP requires clinicians to integrate the best-available, current research evidence, with their own clinical expertise, and to consider patients' needs and preferences, when making clinical decisions. Consideration of the 'best' evidence requires clinicians to evaluate the scientific quality of published studies (i.e., undertake critical appraisal); however, recognised barriers to this process include a lack of skill, a lack of time, and the quantity of published research.

To overcome these established barriers to EBP, we developed a free, online tool that teaches critical appraisal and facilitates the sharing of appraisals amongst a global community of clinicians (CrowdCARE, Crowdsourcing Critical Appraisal of Research Evidence: crowdcare.unimelb.edu.au). Our aim was to investigate the rigor of crowdsourcing critical appraisal from trained novice raters, using CrowdCARE.

Method: Systematic reviews (n=71) were critically appraised in CrowdCARE by five trained novice raters and two expert raters. For each article, the appraisal was performed using a validated tool (Assessing Methodological Quality of Systematic Reviews, AMSTAR) to yield: (i) an aggregate quality score (range: 0-11), and (ii) domain-specific responses for each of the 11 assessment items. After performing independent appraisals, experts resolved any disagreements by consensus (to produce an 'expert consensus' rating, as the gold-standard approach for appraisal in systematic reviews). For novices, the aggregate mean score was calculated.

Critical appraisal quality was investigated by: (i) assessing variability in AMSTAR scoring both between experts and between the expert consensus and mean novice ratings; (ii) calculating the concordance of ratings using Cohen's Kappa (κ); and (iii) identifying "contentious AMSTAR items," defined as when more than half of the novice raters provided a different response to the expert consensus rating.

Results: The variability in aggregate AMSTAR scores was similar between expert raters, and between the expert consensus and mean novice ratings. Comparing the expert consensus rating with individual expert ratings, the AMSTAR score was within ± 1 unit for 82% of studies. Comparing the expert consensus rating with the mean novice rating, the score was within ± 1 unit for 87% of studies. A strong correlation was evident between the expert consensus rating and the mean novice rating (Pearson's correlation coefficient, $r^2=0.89$, $p < 0.0001$). Rating concordance, evaluated using Cohen's Kappa (κ), indicated good overall agreement ($\kappa = 0.67$, 95% CI: 0.61 to 0.73) between the aggregate score of the expert consensus rating and mean novice rating. Furthermore, for 82% of articles, the mean novice assessment was consistent with the expert consensus assessment for at least nine out of 11 the individual AMSTAR assessment items.

Conclusions: These data are the first to demonstrate the merit of crowdsourcing for assessing research quality. We find that novices can be trained to critically appraise systematic reviews in CrowdCARE and overall achieve a high degree of accuracy relative to experts. CrowdCARE provides clinicians with the essential skills to appraise research quality and contributes to making EBP more efficient by removing the substantial duplication of effort made by individual clinicians across the globe. The CrowdCARE datastream can support efficient and rapid evidence synthesis for clinical guidelines and systematic reviews, to inform practice and/or policy, based upon the best-available research evidence.

Cochrane Crowd: new ways of working together to produce health evidence

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Objectives: Cochrane Crowd (<http://crowd.cochrane.org>), Cochrane's citizen science platform, was launched in May 2016. It built on a former project that used crowdsourcing to identify reports of randomized trials for Cochrane's repository of trials, CENTRAL. Cochrane Crowd represents the scaling up of this approach, with the creation a platform offering a range of tasks aimed at identifying and describing health evidence.

Method: Since launch, several tasks have been developed. Many of the tasks require contributors to perform classification exercises on abstracts, whilst others require extraction of information at full-text. Each task undergoes a rigorous development process to ensure that the data collected from each is both useful and of high quality. Training modules are also developed for each task to help contributors perform the tasks without prior knowledge or experience.

In addition, a *Screen For Me* service has been set up to help individual Cochrane author teams handle the often high number of search results retrieved from sensitive searches. This service enables author teams to access the Crowd to help screen their search results.

Teachers of evidence-based healthcare and others can now use Cochrane Crowd within their teaching environments with Classmate (<http://crowd.cochrane.org/classmate>). This enables trainers to use the Cochrane Crowd tasks within their teaching environments to create fun activities and challenges.

Results: 24 months after the launch of Cochrane Crowd, over 8500 contributors had signed up to take part, from over 189 countries. The number of individual classifications made across all tasks exceeded 1.7 million, and over 50,000 reports of randomized trials had been identified for CENTRAL.

Five Cochrane review author teams had accessed the pilot *Screen For Me* service, with the Crowd reducing the number of search results for the author teams by between 50-80%, and completing the screening for each review between 4.5 hours and 3 days.

Classmate, which was launched in September 2017 has now had over 100 'learning activities' based on Cochrane Crowd tasks created.

Conclusions: At a time where research output is growing at an increasing rate, new methods and processes are needed to help researchers and others keep up with the flood of information. Cochrane Crowd is helping to do just that. In addition, the popularity of Cochrane Crowd has demonstrated just how much people want to be a part of the solution to information overload.

Digital education for guidelines adoption and adherence: preliminary findings from a systematic review

Aijia Soong, [Lorraine Tudor Car](#)

Lee Kong Chian School of Medicine, NTU, Singapore, Singapore

Objectives: To present preliminary findings from our systematic review of the literature on digital education for guidelines adoption and adherence.

Method: Digital education holds promise for enhancing health professionals' education worldwide. and is increasingly employed as part of continuing medical education. Clinical practice guidelines are evidence-based recommendations intended to optimize patient care. They are an important source of information for clinicians, designed to help them assimilate, evaluate and implement the evidence in making decisions about appropriate and effective care for their patients. As part of a global initiative evaluating effectiveness of digital education for healthcare professionals' education, we performed a systematic review focusing on the use of digital education for clinical practice guidelines adoption and adherence. We considered eligible studies focusing on all healthcare professionals, using any digital education modality and employing different comparisons regardless of the setting or language. We employed a sensitive search strategy focusing and the standard Cochrane methods and searched seven electronic databases from January 1990 to August 2017.

Results: We found 18 studies involving 4474 participants. Thirteen studies were randomised controlled trials (RCTs) and five were cluster RCTs (cRCTs). The interventions were diverse and included online modules, videos, emails, text messaging and virtual patients. Knowledge was the most widely reported outcome among all the studies. Overall, the reported findings for the studies were mixed. Satisfaction outcomes show that digital interventions are favoured over traditional learning interventions. Evidence was mostly judged as low quality due to high or unclear risk of bias, inconsistency, and indirectness and imprecision, and publication bias. The included studies were largely from high-income countries and many were poorly reported in terms of the intervention content, the employed learning theory, and the control group. There was often a lack of baseline evaluation, outcome measure validity information, patient-

focused, behavioural or economic outcomes etc. None of the included studies reported unintended or adverse effects of the interventions.

Conclusions: The evidence on the effectiveness of digital learning for guideline implementation in healthcare professionals is mixed. Further research on cost and patient-related, as well as adverse effects of digital interventions are needed.

Gallstone, snake venom and witchcraft for schizophrenia: the challenges of classifying [schizophrenia] trials

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Cochrane Schizophrenia Group, the Institute of Mental Health, University of Nottingham, Nottingham, United Kingdom

Introduction: Using a study-based register in the process of systematic reviewing reduces waste and makes it possible to shortcut many processes normally undertaken by review teams. However, this works for simple 'Intervention X vs. Intervention Y for Condition Z'-style reviews, but the challenge is to provide the same shortcuts for systematic reviews of classes of interventions, overviews or network meta-analyses. As one might expect an Information Specialist to say, classification is the answer.

Objectives: To report experience and progress with specific classification of healthcare conditions, interventions, and outcomes for the purposes of facilitating systematic reviews.

Methods: We used the study-based Register of Cochrane Schizophrenia Group (in MS-Access MeerKat 1.6; holds 25,212 reports of 18,105 studies - 28 Feb 2018). The PICO meta-data (health care problems, interventions, comparisons, and outcomes) of each study have been extracted. We used NLM's MeSH, The British National Formulary, and WHO ATC classification system.

Results:

Health care problems: In the 18,105 studies we identified 266 health care problems within schizophrenia trials which were specific focus of the evaluation - amongst which negative symptoms (546 trials), treatment resistance (467 trials), depression (350 trials), tardive dyskinesia (293 trials) and weight gain (260 trials) were the most common.

Interventions: Of the 3910 interventions randomised within these trials, we found 155 classes of drugs with antipsychotics, antidepressants, and benzodiazepines being the most researched. There are 41 additional specific interventions related to some sort of physical/exercise approach. Classifying psychological interventions, and Chinese Traditional Medicine (with its 537 trials with 246 interventions) remains a challenge.

Outcomes: We use seven main classes for outcomes within schizophrenia reviews: Global State, Mental State, Adverse Events, Functioning, Service Use, Quality of Life, and Cost. We propose to use existing classification of outcome tools to clean and curate the 13,187 outcomes. Classification heaven!

Conclusions: Better reporting of PICO meta-data would help and improve classification. However, all current classification systems do not really fit the systematic review purpose. New systems, designed with

systematic review output in mind, greatly enhance the review process (including prioritisation of titles) and reviewer experience (including prioritisation of effort).

Methods for Identifying and Displaying Research Gaps

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Objectives: The current body of research is growing, with over 1 million clinical research papers published from clinical trials alone. This volume of health research demonstrates the importance of conducting knowledge syntheses in providing the evidence base and identifying gaps, which can inform further research, policy-making, and practice. This study aims to describe methods for identifying and displaying research gaps.

Method: A scoping review using the Arksey and O'Malley methodological framework was conducted. We searched Medline, Pub Med, EMBASE, Cochrane Library, Scopus, Web of Science, PROSPERO register, TRIP, Google Scholar and Google. The following combination of terms were used: "identifying gaps in research", "research gaps", "evidence gaps", "research uncertainties", "research gaps identification", "research gaps prioritization" and "methods". The searches were limited to English, conducted in humans and published in the last 10 years for databases searches and unrestricted for hand and expert suggestion articles.

Results: The literature search retrieved 1938 references, of which 139 were included for data synthesis. Of the 139 studies, 91(65%) aimed to identify gaps, 22(16%) determine research priorities and 26(19%) on both identifying gaps and determining research priorities. A total of 13 different definitions of research gaps were identified. The methods for identifying gaps included different study designs, examples included primary research methods (quantitative surveys, interview, and focus groups), secondary research methods (systematic reviews, overview of reviews, scoping reviews, evidence mapping and bibliometric analysis), primary and secondary research methods (James Lind Alliance Priority Setting Partnerships (JLA PSP) and Global Evidence Mapping (GEM)). Some of the examples of methods to determine research priorities included delphi survey, needs assessment, consensus meeting and Interviews. The methods for displaying gaps and determine research priorities mainly varied according to the number of variables being presented.

Conclusions: This study provides an overview of different methods used to and/or reported on identifying gaps, determining research priorities and displaying both gaps and research priorities. These study findings can be adapted to inform the development of methodological guidance on ways to advance methods to identify, prioritize and display gaps to inform research and evidence-based decision-making.

Wikipedia Medical Page Editing as a Platform to Teach Evidence-Based Medicine

Heather Murray¹, Melanie Walker¹, Lauren Maggio², Jennifer Dawson³

¹Queen's University, Kingston, Canada. ²Uniformed Services University, Bethesda, USA. ³University of Ottawa, Ottawa, Canada

Objectives: Medical articles on Wikipedia are viewed over 10 million times a day and Wikipedia is arguably the most-read medical information platform on the internet. The quality and evidence-base of Wikipedia medical articles are improving but there is an ongoing need for refinement and updating. Editing and improving these articles represents a 'whole task' application of the steps in Evidence-Based Medicine (EBM) while simultaneously contributing to an altruistic mission of knowledge sharing and health advocacy. Involving medical students in Wikipedia-editing initiatives provides an opportunity for application of EBM skills while also improving medical articles on Wikipedia. We developed an embedded longitudinal Wikipedia editing project as part of a first year critical appraisal course in the School of Medicine at Queen's University, Canada. Our goal was to evaluate the design and implementation of this project using student feedback in a structured survey.

Method: Students completed online training modules provided by Wikipedia and chose a medical article to improve. Students worked in small groups to assess their articles, made suggestions for improvement, and searched the literature for high-quality secondary sources containing suitable evidence. They posted suggested changes to the Wikipedia community for feedback and consulted with a faculty expert prior to making final page edits. All students completed a Wikipedia project evaluation form. Feedback was sought on the perceived strengths, weaknesses, struggles in project completion, and suggestions for improvement going forward. Using the Five-Dimensional Framework for Authentic Assessment (Gulikers, JTM et al., 2004), student feedback data was reviewed by two investigators (MW and LM) who independently identified barriers to/facilitators in project completion and assigned them into one of five dimensions relating to (1) the task (2) the physical/virtual context (3) the social context; (4) the result and (5) the criteria for evaluation.

Results: One hundred and one students made over 1000 edits to 16 articles, adding over 10,000 words to the pages, all with appropriate secondary source citations. Based on a preliminary review of the feedback data, students enjoyed applying the critical appraisal skills taught within the broader scope of the course (task), they liked making an improvement to a highly accessed public resource (result), they reported positive collaboration within their teams (social context), and they enjoyed learning about the process involved in forming and editing a Wikipedia medical page (task). Barriers to the project identified by the students included a lack of clarity regarding assignment expectations (task), frustration with Wikipedia coding (task), difficulty engaging with the Wikipedia editors/community (social context), distrust of Wikipedia editors as content experts (social context), and a perceived mismatch in efforts dedicated to the assignment and the resulting change/impact on their Wikipedia medical page (result).

Conclusions: Initial results highlight important barriers and facilitators identified by medical students in engaging with and completing the longitudinal Wikipedia assignment as part of their first-year critical appraisal, research and life long learning course. These results will inform the future delivery and assessment of this assignment in an effort to increase engagement among first-year medical students in improving one of the leading sources of online health information worldwide.

Application and retention of evidence based practice skills: Students and practitioner's perspectives from an Indian healthcare institution

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Objectives: With two decades of introduction of Pharmacy Practice education and a decade of Pharm D program in India, there has been a paradigm shift in the practice of evidence-based clinical pharmacy/pharmacology in the country. Wide variation exists in the requirement of teaching evidence based medicine / evidence based practice (EBP) across health discipline in India. The Pharmacy Council of India lists 'provision of evidence-based pharmaceutical care' as one of the core duties for a registered pharmacy practitioner. With the efforts being on integrating clinical focused role of a pharmacist there is a need to contemplate where the EBP learning and teaching skills stands at this juncture. The present study aimed to identify and assess specific knowledge gaps, attitudes and retention of EBP skills among pharmacy student cohort and to comment on their relation to current education practices. The study also aimed to assess practitioner's perspective on EBP skills at workplace.

Method: A prospective cross-sectional study was undertaken as a component of need-analysis to identify and assess specific student perspective on EBP teaching and workforce preparedness. Institution ethics approval was obtained prior to the study. The study included feedback from students enrolled in Master in Pharmacy (M.Pharm) in Pharmacy Practice program and students enrolled in Pharm D program in year 5 and 6. Feedback from clinicians (registered medical practitioners and residents) were also obtained to perceive their understanding of need for EBP skilled graduates. Questionnaire were designed, piloted and standardised based on educational evidence and expert opinion. Descriptive statistics were applied to extract the key points from the need analysis.

Results: A total of 40 students participated in the survey. Majority (95%) of the participants felt the need for training in core evidence-based skills (critical appraisal skills and knowledge of clinical epidemiology principles). Sixty five percent of the pharmacy interns reported lack of workforce preparedness to integrate EBP skills whilst provision of pharmaceutical care. Reported barriers include lack of training in the curriculum and demanding time at workplace. Students felt the need to reduce the mechanistic of EBP provision through integration of mobile application and periodic educational activities. Twenty-eight medical practitioners and 12 residents provided their feedback. Lack of training among the interns and students to facilitate EBP at workplace was highlighted. Need for innovative methods to reduce time-

spent in critical appraisal of biomedical evidence was emphasised. This included concise, pre-appraised/synthesised source of evidence with easy accessibility at workplace.

Conclusions: Current findings suggest that recent graduates are less than optimally equipped with the behaviour, knowledge and skills required for EBP at workplace. The curriculum needs consolidation of EBP component. Existing evidence tools/critical appraisal methods are not easily transferable in demanding workplace. With the ever-changing demands of healthcare workplace into which the students are transitioning, EBP teaching has a challenging task to meet student and employer need and provide better patient care in a country with diverse health issues and significant gaps in evidence-based clinical practice.

Evidence Based Practice Education for Healthcare Professions – An International Multidisciplinary Perspective.

Elaine Lehane¹, Patricia Leahy-Warren¹, O' Riordan Cliona¹, Eileen Savage¹, Drennan Jonathan¹, O'Tuathaigh Colm¹, Michael O' Connor², Mark Corrigan³, Francis Burke¹, Martina Hayes¹, Helen Lynch¹, Laura Sahn¹, Elizabeth Heffernan⁴, Elizabeth O' Keeffe², Catherine Blake⁵, Frances Horgan³

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Objectives: To ascertain current practice and provision of EBP education across healthcare professions at undergraduate, postgraduate and continuing professional development programme levels for the purpose of making key recommendations to healthcare educators and policy makers in relation to 'best practice' for EBP education.

Method: Three distinct but interlinked phases of research were conducted.

In phase 1, a desktop rapid review was undertaken to provide a contextualised succinct synthesis of literature relating to the competencies and programme components associated with EBP education. In phase 2, interviews with experts (n=5) in evidence based practice education were conducted to ascertain current and nuanced information on EBP education from an international perspective (Australia, New Zealand, Canada, United Kingdom).

In Phase 3, a descriptive, cross-sectional, national, online survey was undertaken to capture and describe baseline data relating to the current provision and practice of EBP education to healthcare professionals at third level institutions and professional training/regulatory bodies in Ireland.

Results: A narrative synthesis of 83 empirical studies revealed that participation in any form of EBP education has beneficial effects across all EBP competencies with the most apparent positive trend derived from multi-modal teaching and learning interventions. Analysis of EBP expert interview data provided definitive advice in relation to: (i) EBP curriculum considerations; (ii) Teaching EBP and (iii) Stakeholder engagement in EBP education. Representation from 11 healthcare professions across academic levels was obtained from the national survey conducted in Phase 3. A considerable amount of EBP activity throughout health profession education was apparent, with strong recognition of the need for EBP principles and processes within curricula to achieve core professional competencies. However, effectively embedding EBP throughout health education curricula requires further strategic development.

Conclusions: Despite positive attitudes towards EBP and a predominant recognition of its necessity for the delivery of quality and safe healthcare, its consistent translation at the point of care remains elusive. An examination of current discourse between academic and clinical educators across healthcare professions is required to progress a ‘real world’ pragmatic approach to the integration of EBP education which has meaningful relevance to students and engenders active engagement from educators, clinicians and policy-makers alike.

A Technology-Enhanced Learning module in Evidence-Based Practice for medical undergraduates

Donncha O'Gradaigh¹, Brendan Leen², Miriam Bell¹

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Objectives: Three tutors with experience and formal training in teaching evidence-based practice have been teaching a didactic programme to medical undergraduates at an Irish Medical School. In response to a shift throughout the medical school curriculum to develop technology-enhanced and blended learning formats, we revised our module content and delivery.

Method: In an introductory classroom session students discussed pre-reading material on core principles. Online material was presented on a proprietary platform which stores narrated slide presentations with support materials, and can limit progression using self-test items. In phase one, students viewed presentations on “ask” and “acquire”, before submitting a clinical query, PICO and search strategy and offering feedback on other students’ work. Over three further weeks, students viewed presentations and support materials on critical appraisal of RCTs and systematic reviews. A classroom session at this point ensured competence in these core skills before a second phase of presentations including diagnostic test studies, qualitative research, guideline development and shared decision-making. A final assignment comprised structured marking of a critical appraisal of a RCT in the context of a clinical scenario.

Course evaluation comprised (i) analysis of usage data from the delivery platform; (ii) student feedback; (iii) external evaluation of final assignments.

Results: Students (n=21) accessed the first-phase course material a mean 3.2 views per presentation and 8.3 hours total (range 6 -24 hours per student). Students engaged twice as long with phase 1 material versus phase 2 topics (53% versus 24% of total time). Student feedback (n=11) rated the material on a five-point scale from “I understand this material a little” to “I fully understand and could teach this material”. Grades for first phase material ranged 3.27 to 4.36. The Advanced topics scored lower, from 2.45 to 3.09. Free-text feedback suggested having more question-based self-assessment for the advanced topics and one suggested more classroom sessions. Students also pointed out that other, more critical assignments and courses had to be prioritised at the end of the term. Eighteen of the 21 participants scored 50% or higher in the final assignment, with pass, fail and distinction grades confirmed by the external examiner.

Conclusions: Evidence-based Practice can be taught in a blended learning course to medical undergraduates, with the majority demonstrating competence on both self- and summative

assessments. Lower performance in advanced topics may reflect the lack of clinical experience of medical undergraduates but these topics may be less suitable for didactic online teaching and require seminar or classroom formats.

A rapid overview of rapid reviews.

Jon Brassey Tripdatabase

Abstract: Jon has worked in the area of rapid reviews for over twenty years and has written extensively on the topic. In this session he will give a personal view on rapid reviews: exploring the different types of rapid reviews, the growing evidence base and the role of automation - including Trip's fully automated review system. Oh yes, he'll also say why he dislikes the term 'rapid reviews' (even though he uses it all the time).

Translation of evidence into better care / Better use of real world data

11:00 Wednesday June 20th

The Need for Establishment of a Minimally Clinical Important Difference and Standardization of Pre and Post-operative assessment.

Xi Ming Zhu¹, Abdus Ansari², Brittany Dennis¹, Charlotte Brookes¹, Moin Khan³, John Grant⁴

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Objectives: To compare the outcomes between autograft and allograft reconstruction in patients with PCL deficiency. During the extraction of data and its comparison and interpretation in the development of this meta-analysis, the lack of standardization in patient follow-up with regards to length of follow-up, modalities measured, and reports of adverse events were notable. Many studies were thus excluded due to failure to meet preset inclusion criteria. The subsequent data analysis therefore became limited in its translation towards guiding clinical and surgical practice. The development of a standardized pre and post-operative assessment and follow-up criteria will not only benefit patients, but will also ensure that future systematic reviews conducted will carry a higher impact towards guiding clinical practice.

Method: Medline, EMBASE, and the Cochrane Library databases were searched from January, 1980 until December 1st, 2016 to identify all relevant articles. Clinical outcomes including International Knee Documentation Committee (IKDC), Tegner and Lysholm scores, joint laxity and posterior tibial displacement were evaluated. Dichotomous outcomes were pooled into odds ratios while continuous outcomes were pooled into weighted mean differences (MD) using random effects meta-analysis.

Results: We conducted a systematic review looking at outcomes of isolated PCL reconstruction comparing autograft vs allograft sources. Clinical outcomes including International Knee Documentation Committee

(IKDC), Lysholm and Tegner scores, joint laxity, and posterior tibial displacement were evaluated. Amongst the 145 unique articles found through the screening process, 25 studies, with a combined patient population of 900, were deemed eligible for inclusion in this study. Post-operative improvement was observed regardless of graft source. Pooled findings revealed that autografts demonstrated a statistically significant post-operative activity as measured by Tegner scores (MD: 0.5, 95% CI 0.03, 0.9; $p = 0.04$) and a reduced posterior laxity (MD: -1.2, 95% CI -1.6, -0.8; $p < 0.00001$).

Conclusions: However, despite a statistically significant improvement, there is difficulty establishing a clinically significant improvement. This stems from the absence of a standardized guideline of measuring pre-operative and post-operative functions. One example is the inconsistent usage of IKDC scores between studies, a failure of reporting both pre and post-operative IKDC scores, and subjective reporting as either “normal” or “abnormal” rather than following a protocol. Thus, the development of a systematic approach to assess patients before and after operations, along with establishment of an agreed minimally clinically important difference will lend to more impactful data analysis and ease of generating guidelines.

From research evidence to ‘evidence by proxy’? Organisational enactment of evidence-based healthcare in four high-income countries

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Objectives: It is usually taken for granted that ‘the best available evidence’ is represented by the findings of rigorous scientific research which, in turn, directly inform the development of recommendations for practice in the form of clinical guidelines. We challenge this assumption and examine the role played in the enactment of evidence-based healthcare by other forms of codified knowledge, i.e. knowledge that is formal, systematic and expressible in language or numbers, making it easy to store, transfer and utilise across space.

The study addresses the following research questions:

1. What forms of codified knowledge are seen as credible evidence by practitioners?
2. What are the relationships between these forms of knowledge in the enactment of evidence-based practice within healthcare organisations?
3. What is the impact of these forms of knowledge on evidence-based practice?
4. How do the composition and impact of codified knowledge vary across different high-income countries?

Method: This exploratory study emerged from a broader research programme examining leadership and facilitation in the implementation of evidence-based nursing across the UK, Australia, Canada and Sweden. Within each country, up to two organisations were selected based on the following criteria: (1) self-declared adherence to the implementation of evidence-based nursing; (2) adequate organisational performance; and (3) broad access to several levels within the organisational hierarchy granted to the

researchers.

55 research participants were recruited to represent different levels of the hierarchy, roles and sectors. Semi-structured interviews served as the main method of data collection. Data analysis was organised in two stages. The first stage, focusing on the construction of country-specific narratives, combined the codes derived from the interview guide with descriptive codes that emerged inductively. The second stage utilised the deductive coding framework informed by the literature and applied across all four datasets. Matrix analysis was deployed to facilitate cross-case analysis.

Results; We argue that research evidence and its direct derivatives, such as clinical guidelines, are NOT the dominant forms of codified knowledge deployed in the organisational enactment of evidence-based healthcare.

We describe the *chain of codified knowledge* which reflects the institutionalisation of evidence-based healthcare as organisational 'business as usual'. This chain is dominated by performance standards, policies and procedures, and locally collected (improvement and audit) data, i.e. various forms of 'evidence by proxy' which are, at best, informed by research partly or indirectly but are nevertheless perceived as credible evidence.

Our cross-country analysis highlights the influence of macro-level ideological, historical and technological factors on the composition and circulation of codified knowledge. Prioritisation of 'evidence' by proxy' and marginalisation of clinical guidelines are likely to be more prominent in those countries, whose healthcare sectors have historically been more engaged with the New Public Management logics of standardisation and performance measurement.

Conclusions: Our analysis reveals dual effects of this codification dynamic on evidence-based healthcare. On the one hand, the legitimisation and mobilisation of contextual and local knowledge counterbalance 'dogmatic authoritarianism' apparent in the more restrictive interpretations of 'evidence' and potentially enable bottom-up knowledge flows. On the other hand, this is achieved through a significant dilution of the initial paradigm, excessive formalisation, and detachment of frontline staff from the fundamental competencies and knowledge base of evidence-based decision-making, whereby direct use of research evidence and clinical guidelines is becoming a prerogative of experts, represented by professional elites and designated facilitators.

What evidence informs midwifery clinical practice when women make birthing decisions that are outside of guidelines? - An empirical study of UK midwives working in the NHS.

Claire Feeley

University of Central Lancashire, Preston, United Kingdom

Objectives: Unconventional birth choices can be characterised as birth choices that go outside of national guidelines and/or when women decline recommended are. The aim of this study was to explore the views and experiences of midwives who self-define as facilitators of women's unconventional birth choices, whilst working within the NHS. By use of professional accounts, this study sought to understand what the midwives did, why, and how they performed evidence-based midwifery practice to fulfill the birth choices of the women in their care.

Method: This study employed a narrative inquiry qualitative study design. 45 NHS midwives were recruited from across the UK during January-July 2017. Participants worked within a range of posts Band 5- 8 and across all maternity settings i.e. community, birth centres and hospital. Participants had two options; to provide a self-written narrative followed by an interview (n=22) or just standalone interview (n=23). Either data collection method asked the participants to describe a detailed account of a clinical occasion where they facilitated a woman's unconventional birth choice. Prompt questions were used to explore the initial clinical situation to explore what, how and why the midwives acted in the way they described, which also led to numerous other clinical situations that were explored during the interview. A pluralistic narrative data analysis strategy was employed to capture the complexities associated with the midwives clinical practice.

Results: Data analysis is currently ongoing (tbc May 2018), however, a key finding is the midwives' use of complex multi-modal evidence gathering techniques to inform clinical practice. Birth choices made by women varied e.g. VBAC at home, homebirth no midwives allowed inside birthing room, declining vaginal examinations during labour, declining transfer to hospital following prolonged third stage. Midwives demonstrated using 'mindlines' for clinical situations that were 'in-the-moment'. Where there was time, during the antenatal period, midwives actively sourced and integrated a wide range of formal information to guide care planning. Where there was little or no evidence to inform clinical practice, midwives drew upon the basic sciences, physiology, simulated practice and clinical expertise to apply such knowledge to clinical situations. Drawing upon notions of novice to expertise, the participants demonstrated high levels of skill and competency to achieve evidence-informed practice where the women's personal preferences were central to the clinical care.

Conclusions: There is an increased onus upon maternity professionals to respect women's autonomous decision making and to provide individualised care. Arguably, neither EBM or guidelines could not ever account for every maternal choice possible, therefore the findings of this study offers insights to how midwives can provide *evidence-informed* clinical care despite such challenges. The large sample set which recruited midwives from a range of maternity settings and who held a wide range of positions suggests transferability of the findings to other similar maternity settings.

Exploring opinions about research translation held by leading Australian stroke researchers

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³Australian Catholic University, Sydney, Australia. ⁴Florey Institute of Neuroscience and Mental Health, Melbourne, Australia

Objectives: There is a growing need for researchers to demonstrate impact, which is closely linked with research translation. In Australia, the National Health and Medical Research Council funded a Centre of Research Excellence in Stroke Rehabilitation and Brain Recovery (CRE-Stroke) from 2015-2019 to enhance collaborations between researchers conducting different types of stroke rehabilitation research. CRE-Stroke has 5 research streams: Basic Science, Imaging Discovery, Clinical Trials, Implementation Science and Data Linkage.

In order to guide strategies to boost research translation and impact, in 2016 researchers within the Implementation Science stream of CRE-Stroke sought to explore opinions held by researchers conducting pre-clinical and clinical stroke rehabilitation research about research translation.

Method: A mixed methods (explanatory sequential) study design was used, comprising a paper-based survey and semi-structured interviews. A convenience sample of researchers attending a CRE-Stroke Rehabilitation Workshop and Annual Scientific Meeting of the host organisation were invited to complete the survey. Researchers were asked to describe research translation, discuss who should be responsible to oversee research translation, and whether researchers believe they have the knowledge and skills to translate their research. Survey data from 57 participants were analysed descriptively and were used to inform development of the interview guide. Twenty-seven researchers were purposively selected to provide representation of the breadth of research studies being conducted within CRE-Stroke and were invited to participate in semi-structured interviews; 22 interviews were conducted. Interviews were audio-recorded and transcribed, checked for accuracy by participants, and data were thematically analysed by two reviewers.

Results: Research translation was described two ways: translating to other research and translating to clinical practice and policy. Most researchers (XX%) perceived they were responsible for translating their research via publication, and for 80% of survey participants, publication signalled a project's completion. Some interview participants reinforced the view that the research team's responsibility for translation ceased when results were published or incorporated into guidelines; others believed that researchers should ensure their findings were used in clinical practice, either independently or through collaborating with clinicians and implementation experts.

Only 35% of the survey respondents reported having the skills and knowledge to translate their research beyond the narrow remit of publications and conference presentations. Researchers consistently stressed the difficulty and complexity of research-to-practice translation, and most felt inadequately skilled to coordinate clinical translation projects. In contrast, researchers' self-reported lack of translation skills did not appear to adversely influence translation to other research projects.

Conclusions: Researchers consistently assume responsibility for disseminating their results via publications and conference presentations, and express confidence to translate their research findings to other research. However, translating to clinical practice is less straightforward, both in terms of required skills and lines of responsibility, because in Australia, no group has a clear mandate to ensure that research is translated to clinical practice.

To support research translation within CRE-Stroke, a research translation template has been introduced and its use will be evaluated. CRE-Stroke also provides financial support for collaborative projects between researchers and clinicians to boost research and translation capacity.

Can cluster randomisation of prescribing policy be used to efficiently generate drug safety and effectiveness data within the NHS? Pilot data from the EVIDENCE study.

Amy Rogers, Angela Flynn, Alex Doney, Robert Flynn, Tom McDonald

University of Dundee, Dundee, United Kingdom

Objectives: The Evaluating Diuretics in Normal Care (EVIDENCE) study aims to demonstrate whether a pragmatic cluster randomisation methodology, using existing NHS prescribing policies and mechanisms combined with routinely collected data, can be used to answer an important clinical question in the absence of head-to-head randomised trials.

Method: Changes in prescribing policy are rarely formally evaluated. In 2011, NICE hypertension guidelines included a recommendation that indapamide or chlorthalidone (thiazide-like diuretics) should be used in preference to bendroflumethiazide (thiazide diuretic) in the management of hypertension [1]. This guidance has not been fully implemented. 70% of prescriptions for thiazide or thiazide-like diuretics dispensed in England in November 2017 were for bendroflumethiazide [2]. Reasons for non-implementation may include inertia, drug pricing and availability. However, it is notable that many physicians felt that the guidance was based upon insufficient evidence. EVIDENCE uses a cluster randomised, parallel group design to evaluate the NICE recommendation. Randomisation is at GP practice level with allocation to either bendroflumethiazide or indapamide as preferred diuretic for use in hypertension. Routine prescriptions are switched, where necessary, to comply with the policy, using existing mechanisms. Routinely collected NHS data will be used to monitor prescribing and to identify cardiovascular endpoints.

Results: The EVIDENCE study protocol has been approved by a Research Ethics Committee and the initial pilot phase has commenced in Tayside, Scotland. Between May 2017 and October 2017, nearly 2.9 million doses of thiazide or thiazide like diuretics were dispensed in NHS Tayside. 84% of these were bendroflumethiazide and only 16% were indapamide. We will present data on a pilot cohort of at least ten randomised practices within NHS Tayside. These data will include the numbers of patients prescribed study medications before and after the policy implementation along with measures of adherence to applied switching and reasons for non-adherence. It is likely that cardiovascular events in this pilot phase will be few but results will demonstrate the utility of routinely collected prescribing and hospitalisation data.

Conclusions: EVIDENCE will test a novel methodology for conducting comparative effectiveness research efficiently within the NHS. It is anticipated that this methodology will be applicable to the assessment of many diverse medications and interventions in current routine use where there is insufficient evidence to guide clinical practice.

1. [\(2011\) NICE Update of clinical guidelines 18 and 34 Hypertension The clinical management of primary hypertension in adults Clinical Guideline 127 Methods, evidence, and recommendations August 2011. NICE](#)

2. [Powell-Smith A, Goldacre B \(2015\) OpenPrescribing.net. In: OpenPrescribing.net. https://openprescribing.net/.](#)

Using Data to Improve Care and Health Outcomes in Resource-limited Settings: Reflections from Knowledge to Wisdom and Implications at Children’s Cancer Hospital 57357 – Egypt

Ranin Soliman¹, Alaa Elhaddad¹, Wael Eweida¹, Jason Oke², Carl Heneghan²

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Objectives: Using data to improve care and outcomes is particularly important for developing countries with high burden of disease and inferior health outcomes. However, there is limited use of data in resource-limited settings based on evidence. The aim of this work is to highlight the significant role of data to improve care and outcomes in resource-limited settings and outline the barriers and potential solutions to use data for evidence-based decision-making in developing countries. The study also aims to reflect on a practical example of using real-world data at the Children's Cancer Hospital 57357 – Egypt (CCHE) and proposes the use of predictive analytics/modeling to improve care delivery and outcomes for children with cancer in Egypt through building learning health systems.

Method: We reviewed the literature on the use of health data and analytics to improve care and health outcomes in resource-limited settings, to determine available applications, barriers and potential solutions for implementation in developing countries. We searched on PubMed, Google, and Google Scholar using search terms “health data”, “data-driven improvements”, “big data”, “advanced analytics”, “resource-limited settings”, “developing countries”, “improving outcomes”, “barriers”, “potential solutions”, and “EMR”. This was followed by reflection on a practical example of using real world data to improve care delivery and outcomes at CCHE and a proposed approach to use predictive analytics and modeling for evidence-based improvements in care delivery and patients' outcomes.

Results: Initial search showed 53 articles of which 23 were considered relevant and were included. Studies were reviewed for the setting, medical condition, data source, outcomes, barriers to implementation and potential solutions. Limited studies used data to make evidence-based decisions. Some barriers included unavailable data collection modalities, limited information technology investments, lack of national data registries, and cultural resistance. Potential solutions were adopting EMRs for data collection, building hospital-based registries, and cultural change. CCHE is an example for using data to improve care and outcomes for children with cancer in Egypt. CCHE adopts EMR for routine data collection, monitoring and analysis to optimize translation of data into improved clinical practice and better decision-making. CCHE will adopt predictive modeling through forecasting future events and allowing providers to tailor treatments and services accordingly. Applying predictive analytics at CCHE will optimize the use of data for evidence-informed decision-making and building a learning health system.

Conclusions: The use of real world data to drive improvements in care delivery and health outcomes is very important in resource-limited settings. Despite current barriers for the optimal use of data to inform evidence-based decisions in developing countries, there are potential solutions that are believed to drive change and help overcome the challenge. A successful example was implemented at the Children's Cancer Hospital in Egypt with efficient and effective data utilization for data-driven improvements. Applying predictive modelling at CCHE would be a great step towards translating knowledge into wisdom to make evidence-based decisions based on future predictions of outcomes.

Advantages and Disadvantages of Using Algorithms for Selecting Psychopharmacology Treatment

Dr David Osser

VA Boston Healthcare System and Harvard Medical School, Brockton, MA, USA

While standardized care driven by evidence-supported algorithms is a model that has produced good outcomes with illnesses such as diabetes, pneumonia, and heart disease, there have not been very many studies in psychiatry and the results have been modest. The literature on psychopharmacology algorithm-informed care in comparison with treatment-as-usual was examined.

Bauer and colleagues examined tests of psychopharmacology guidelines up to the year 2000 and found that 6 of 13 studies reported improved outcomes associated with guideline adherence. Psychopharmacology algorithm studies in depression were reviewed by Adli and colleagues who found that patients treated with the algorithm initially benefitted more than the control group but further separation from treatment as usual did not necessarily occur over time. The early benefits could have been due to more intensive patient involvement with the project coordinator in the algorithm group. Studies in schizophrenia have found small advantages from following an algorithm (Texas Algorithm Project and German Society for Psychiatry guideline), including reduced side effects and less polypharmacy with antipsychotics.

All controlled studies to date have compared use of an entire algorithm versus treatment as usual. In an algorithm there are multiple recommendations. In the schizophrenia studies, physicians rarely complied with the algorithm recommendation to use clozapine after two adequate trials of antipsychotics. The control groups also rarely used clozapine. This probably accounts for the lack of strong outcome differences: algorithm-following physicians did not choose to follow the recommendation with the greatest likelihood of producing a better outcome for their patients. 95% of patients who meet criteria for clozapine in the United States are not getting it. Use algorithms!

Educating patients / Improving the dissemination of evidence

11:00 Wednesday June 20th

Is honesty the best policy? The adequacy of disclosure as a strategy for addressing competing interests in patient decision aid development

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Objectives: Competing interests among patient decision aid developers have the potential to undermine the capacity of these tools to support patients and others to make informed health decisions. Prominent decision aid quality frameworks (e.g., the International Patient Decision Aids Standards (IPDAS), the (United States) National Standards for the Certification of Patient Decision Aids) attempt to address this issue by advocating disclosure of decision aid funding sources and developers' competing interests. Although the adequacy of this approach has been questioned on more than one occasion, we are aware

of no empirical evidence pertaining to patients' understanding of and reactions to competing interest disclosure statements. Here we present a secondary analysis of data collected in the process of developing a patient decision aid on postpartum contraception to shed light on this issue.

Method: We administered an online survey of people who were currently pregnant and/or ≤ 24 months postpartum, could read and write English, and resided in the United States. Participants were recruited using a commercial panel service. As part of the survey, we presented participants with a list of six information elements and solicited their views on whether each ought to be included in the decision aid itself or in a supporting document. One of the information elements was, "information about whether those who wrote the guide will make money based on what decisions people make after using the guide". Other elements pertained to decision aid development and user testing, evidence sources, update policy, readability, and authors and their qualifications. Immediately after this, an open text question invited participants to elaborate on their responses or make additional suggestions.

Results: Of the 286 eligible participants, 46% responded that information on competing interests should be included in the decision aid itself, while 54% felt that it should be included in a supporting document. Notably, competing interest information was endorsed for inclusion in the decision aid less frequently than most other information elements. Some participants' open text responses reiterated the perceived importance of competing interest information ("Full disclosure of who is to profit from choices presented by the guide.") However, other participants' comments suggested a limited understanding of its relevance and/or little interest in it ("I don't think people need information about what is going to happen with money when using the guide, it has nothing to do with birth control," "The information is more important than who is making money off it because someone is always making money off something").

Conclusions: Relying on mere disclosure of competing interests among patient decision aid developers may not adequately mitigate the negative effects of those interests for all decision aid users. Further research dedicated to exploring diverse patients' understanding of and attitudes toward competing interest disclosure statements, as well as if and how such statements modify patients' interpretation of the content and perceived trustworthiness of the decision aid, is warranted.

Engaging US partners in Cochrane's Next Generation Evidence Systems

Cathy Gordon¹, Jennifer Gilbert², Mark Helfand³

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Objectives: To identify long-term partners who are interested in developing Living Systematic reviews or Living Guidelines.

To build an active online community of "citizen scientists" through developing strategic partnerships with US consumer and professional organizations.

To identify partners who were interested in disseminating Cochrane Crowd recruitment information to their members.

Method: We developed a multi-tiered, multi-phased approach to partner engagement

•**Phase I**—Targeted outreach to 40 consumer/professional organizations or individuals who were advanced users of evidence. Professional organizations were selected for recruitment based on potential interest in the research topic and ties to consumer/patient networks

Methods of engagement included:

Introductory Informational Webinar October 2017

•**Phase II**—Deepening relationships with interested organizations for the purpose of exploring partnership opportunities in Living Systematic Reviews or Guidelines and dissemination of recruitment materials to consumers.

Methods of engagement included:

Conference calls with extended teams

Webinars with live demonstrations of Cochrane Crowd

Exploration of interest in

Invitation to evaluate written and online materials

•**Phase III**—Broad outreach to consumer/professional organizations with newsletters, blogs, websites or listservs

Methods of engagement included:

Presentations at national and international research meetings

Email contact with 200 organizations to request dissemination of Crowd recruitment information to their members

Results: Each phase and method of engagement was successful to some degree. We gained interested partners through both targeted and broad outreach. Some partners are interested in the development of Living Systematic Reviews and Guidelines and others are interested in being dissemination partners and some are interested in both activities. We also were able to engage organizations whose membership provided valuable evaluation of written materials for the Crowd platform. Partnership organizations included:

The CDC Community Guide

American Academy of Family Physicians

Consumers United for Evidence-Based Healthcare

Patient and Clinician Engagement (PaCE); North American Primary Care Research Group

Stop Obesity Now

AARP

Conclusions: Existing systems of health evidence generation are expensive and resource intensive. Consumer and professional organizations in the US are interested in Cochrane's new system of evidence generation which promises to be more efficient in getting necessary information into the hands of decision-makers in a timelier manner. However, building meaningful partnerships with these organizations requires time and resources in order to orient and educate leadership and membership about the new concepts. In addition, partnership organizations will require more time to identify how best to use these new systems to best advantage. Future work will be needed to deepen these new partnerships.

Presenting evidence for service improvement; the care of older people living with frailty in acute hospital settings

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Objectives: The challenge of implementing good evidence into practice has long been acknowledged. In 1968, Lord Rosenheim (then President of the Royal College of Physicians) told the World Health Organisation that if no further research were undertaken for the next twenty year but instead there were to be wholesale implementation of existing evidence, world health would be transformed (Bradley et al 2010).

The objectives of this project were two fold;

- 1) to present an integrated narrative of the current state of evidence
- 2) to explore how this could be used to inform a quality improvement collaborative.

Bradley, E., Mcsherry, W. and Mcsherry, R. (2010) Disseminating research: how joint NHS and university posts can support this process. Nursing times, 106(44), pp.20-22

Method: A non-systematic search of NIHR funded research (including Cochrane reviews) identified 53 studies which were thematically analysed. The review (Comprehensive Care) was structured around the chronological journey through acute services with a cross cutting section on the therapeutic benefits of caring environments. The evidence was contextualised with commentary and findings from other researchers, painting a picture of the uptake of the evidence in NHS practice. The review contain a number of reflective questions for provider boards, practitioners and older people living with frailty and their families.

Recognising that decisions about practice are based on a trilogy of evidence, values and resources Wessex Academic Health Science Network used the review with providers within to create a local improvement collaborative. All acute Trusts in Wessex were invited to complete an audit based on the review questions.

NIHR Dissemination Centre (2017) *Comprehensive Care* <http://www.dc.nihr.ac.uk/themed-reviews/comprehensive-care.htm>

Results: There is strong evidence that the use of frailty indices and Comprehensive Geriatric Assessment (CGA) to identify older people living with frailty can reduce harms, mortality and admission to residential care; however, there is poor transfer of information between social care, primary care and secondary care only 42% of acute Trust undertake early CGA. Older people living with frailty access all parts of hospital care but awareness of the frailty syndromes is low in staff outside specialist older people's services. This presentation will describe how the AHSN developed an audit based on the themed review and how the audit findings will be used a group of acute care staff to improve care planning and delivery.

Conclusions: Robust research with clear findings is the start of a journey to provide excellence in health and social care. Combining different research evidence into a narrative around a holistic patient experience can illuminate the challenges in developing service designs that meet the needs of older people living with frailty within complex acute services. A QI project to create a consensus and audit of best practice is a further step towards implementing the evidence.

Using narratives and storytelling to engage the public with science

Beatriz Goulão on behalf of the Public Engagement Group in the Health Services Research Unit, University of Aberdeen

Health Services Research Unit, University of Aberdeen, Aberdeen, United Kingdom

Objectives: Public engagement describes different ways to share research outputs with the public. It is a two-way process that aims to generate mutual benefit, such as learning or developing better research. Storytelling is a creative and appealing tool to communicate science to the public. Research suggests narratives are easier to comprehend and audiences find them more engaging than communication methods used traditionally in the scientific community. Different mechanisms help explain this: the use of characters makes the concepts relatable to the audience; a story gives context to the audience, increasing understanding and memory re-call; and plot development can help make causal relationships apparent, helping audiences process complex information. Our aim was to use storytelling and narratives to develop engagement activities targeting the public (defined here as non-expert audiences), with the objective of explaining concepts related to Health Services Research.

Method: Since 2015, the Public Engagement Group at the Health Services Research Unit (HSRU) has developed storytelling activities to communicate two broad research concepts: randomised controlled trials and evidence synthesis. We created characters and built stories centred around them and the concepts we wanted to convey, through brainstorming meetings. We tested our activities in small practice runs, and refined them once they were ongoing to adapt to the public's reactions, level of understanding and enjoyment. We have added sensory elements to the stories, such as visual and sound cues to attract the attention of passers-by. We evaluated the activities using short questionnaires asking participants about their perceived level of understanding and enjoyment. Participants were also invited to leave their contact details if they were interested in learning more about a public involvement group.

Results: We have participated in four science festivals and have visited two local schools, engaging with over 2,000 people. All our activities have involved a narrative: James Lind is the main character in our clinical trials activities to explain the randomisation process; we randomised 474 participants to two types of candy and asked how much they enjoyed it. Using costumes, balloons and randomisation bells resulted in attracting more people and catering to different learning styles. We have used Sherlock Holmes and a treasure hunt narrative to map out and describe the different steps of an evidence synthesis process to school children (aged 6 – 10). 232 children took part in the treasure hunt with the aim of finding out a health mystery. Questionnaire replies indicated 90% of the participants have enjoyed the activities. Over 50 citizens have signed up to be contacted for a public and participant involvement group after taking part.

Conclusions: We present here two successful and distinct examples of public engagement with science using storytelling and characters targeted at different audiences: adults and children. Storytelling is an effective way of engaging the public with science and explaining abstract concepts in a fun way. Using visual and sound cues attracts attention and curiosity that eventually develops into a conversation between researchers and the public. This is a first step in empowering and involving the public in the research process.

Extracting large sets of data from systematic reviews: developing a basis for separating, storing and using information on trials

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Objectives: Qualitative and quantitative data relevant to randomised controlled trials (RCT), manually extracted and analysed within Cochrane reviews, are available to those who have access to the Cochrane Library. If, however, one wished to re-use these data, all information has to be extracted from that *review* before that process can start. There are great benefits of widely sharing data – and drawbacks in not sharing. This work explores whether it is possible to i. extract all trial data from the systematic reviews; and prepare these data to be widely accessed. Therefore, the aim is to make the process of transposing data from RCTs into a web-based curated, accessible database easy.

Method: Resources for this work are 200 systematic reviews of the Cochrane Schizophrenia Group (Nottingham) and open source software.

We produced a Java-based app with functionality to extract all trial data from a list of systematic reviews. (The reviews, available in ReviewManager5 format, are parsed as the app accesses relevant parts of the reviews; in turn the data within the included studies are parsed into a format that can be downloaded, uploaded and reused).

This creates the possibility for results to be stored in a way that:

all relevant data are ready to be used by others

data can be auto-tidied and re-planted back into the source review

Results: The product of this work is a simple end-user app. By its use Cochrane groups can create a database with all data they have extracted for their reviews.

Conclusions: Supporting auto-extraction, auto-curation, wide dissemination and re-use of well-extracted data has advantages for all. There are many imaginative things that can be done with these data for all categories of end-users.

Tribalism and binary thinking are crippling public discourse: truth lies bleeding.

Bruce Hugman, Communications Specialist, Uppsala Monitoring Centre

Objectives:

1. Examine contemporary processes that undermine the Enlightenment values of reason, science and humanism, as they affect attitudes to science and medicine.
2. Assess the impact of the degradation of public discourse in relation to the credibility of evidence and the practice of medicine.
3. Propose defensive measures against the assault on truth.

Methods: This year's work extends the thinking and research behind last year's presentation at EL - *The impact of the conflicting paradigms of Western scientific and traditional medicines*. The canvas this year is much broader: the effects of social movements and individual behavior on perceptions of medicine and engagement with healthcare.

Interim conclusions: The rise of 'identity politics' has had a profound effect on the social and political landscape. It has tended to reduce individual freedom to hold or express views that are at odds with a prevailing group norm and has, in some cases, induced a bunker mentality. Multiple social and political factors have resulted in fragmentation and polarization, and a loss of reason and nuance in public discourse; there is a headlong drive to binary choices, driven by belief, encapsulated by the fallacious maxim, 'If you aren't with us, you're against us'. The corrupting forces of unreason are most obvious in relation to climate change; vaccination, evolution, homeopathy, other alternative therapies, and dietary fads are other concerns in our field of interest. A 'conservative bystander culture' has allowed serious damage to be done to the public case for science. In response, forceful arguments and cascading data do not work; we must find other points of entry to the beliefs, emotions and preoccupations of sceptics and antagonists, wherever truth and reason are under threat. Patients trust their doctors far more than any other profession (except nurses). The patient consultation is a critical place to start the dialogue of science in the human context of individual values and preoccupations. Beyond that, we need to seek areas of common ground, especially in terms of values and feeling, with those who oppose us and Enlightenment values and to build rapport, in stark contrast to the bluster of public health rhetoric and data. We have to understand that the nuanced and incremental nature of science is a process that is largely alien to contemporary popular culture, and that uncertainty and ambiguity tend to inspire anxiety and retreat rather than wonder and delight. [395 words]

Misrepresentation and Overinterpretation in Evaluations of Biomarkers in Ovarian Cancer: A Systematic Review

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Objectives: We aimed to (1) document and classify spin (i.e., misrepresentation and overinterpretation of study findings in the title, abstract, and main text conclusion, exaggerating the performance of the biomarker), and (2) facilitators of spin (i.e., practices that would facilitate overinterpretation of results), in recent clinical studies evaluating the performance of biomarkers in ovarian cancer.

Method: We searched PubMed systematically for all evaluations of biomarkers in ovarian cancer published in 2015. Studies eligible for inclusion reported the clinical performance of prognostic, predictive, or diagnostic biomarkers. Reviews, animal studies, and cell line studies were excluded. All studies were independently screened by two reviewers. To document and characterize spin, we developed a set of scoring criteria with two reviewers.

Results: In total, 1026 citations were retrieved by our search strategy; 326 studies met all eligibility criteria, of which the first 200 studies, when ranked according to publication date, were included in our analysis. One-third (60; 30%) of studies were free of spin, one-third (65; 32.5%) contained one type of spin, and another third (75; 38%) contained two or more forms of spin in the article. Spin was classified into two categories: (1) misrepresentation, (2) misinterpretation. The most frequent forms of spin identified were: (1) other purposes of biomarker claimed not investigated (65; 32.5%); (2) mismatch between intended aim and conclusion (57; 28.5%); and (3) incorrect presentation of results (40; 20%). Frequently observed facilitators of spin were: (1) not stating sample size calculations (200; 100%); (2) not mentioning potential harms (200; 100%); and (3) not pre-specifying a positivity threshold for a continuous biomarker (84 of 164 studies; 51.2%);

Conclusions: Reports of studies evaluating the clinical performance of biomarkers in ovarian cancer frequently have spin. Misinterpretation and misrepresentation of biomarker performance may account for a considerable amount of waste in the biomarker discovery process. Strategies to curb inflated and biased reporting are needed to improve the quality and credibility of published biomarker studies.