Fingertip blood samples present innovative way to assess lymphocyte diurnal variation

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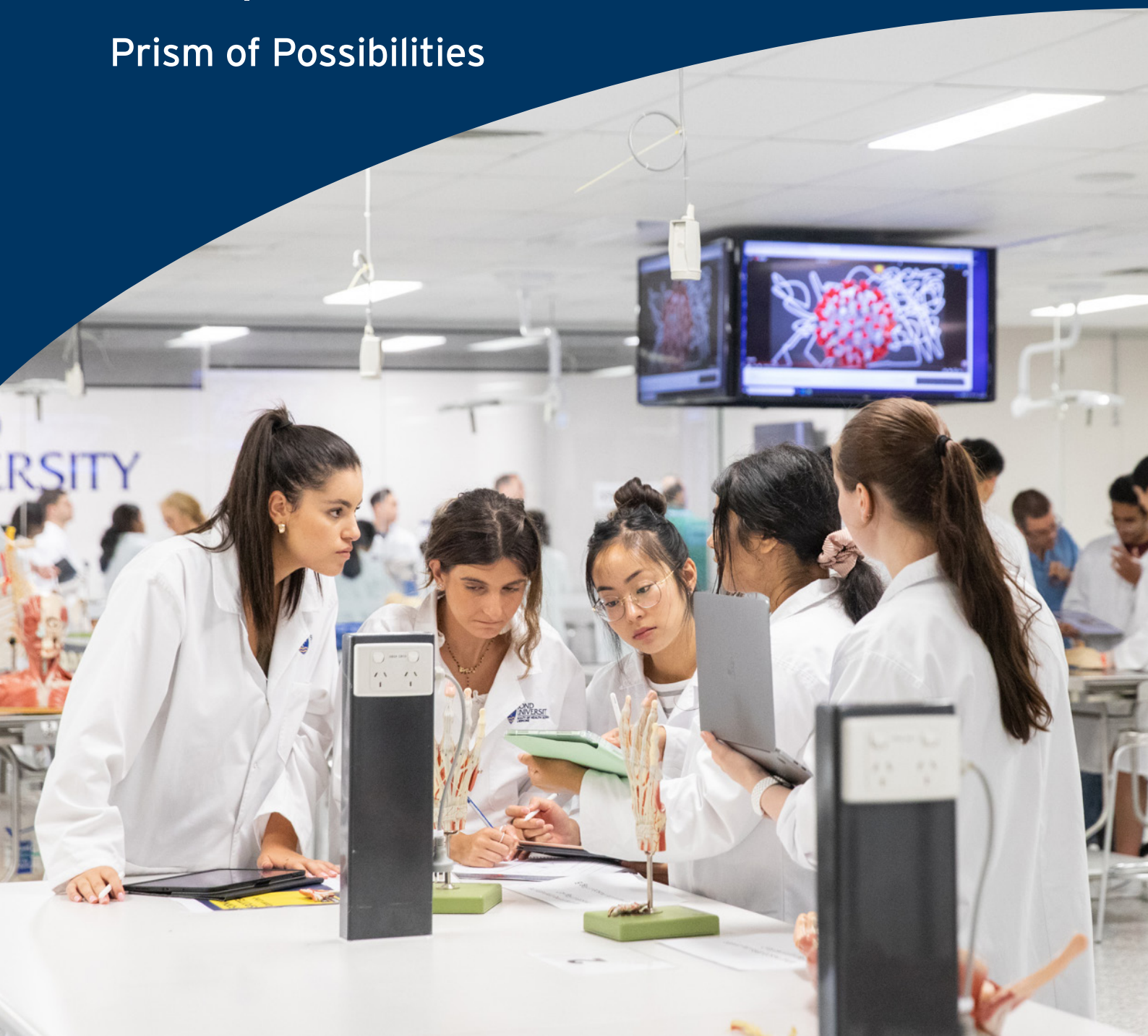
BOND UNIVERSITY
FACULTY OF HEALTH SCIENCES & MEDICINE

HSM Medical and Postgraduate Students Research Conference

2021 | Book of Abstracts

Prism of Possibilities



When you have exhausted
all possibilities, remember this:
you haven't.

Thomas Edison

PROGRAM

0900 - 0915	**Introduction** – **Dr Jaclyn Szkwara** *(MD Academic Coordinator, Faculty of Health Sciences and Medicine, Bond University)* **Welcome & Opening Address** – **Prof Nick Zwar** *(Executive Dean, Faculty of Health Sciences and Medicine, Bond University)*					
0915 - 1000	**Keynote Presentation** **Prof Ajay Rane OAM** *(Professor, Obstetrics & Gynaecology, James Cook University)*					
1000 - 1100	**Panel Discussion** – **A/Prof Justin Keogh** *(Facilitator, Associate Dean of Research, Faculty of Health Sciences and Medicine, Bond University)* **Dr Gina Cleo, Dr Hadyn Dodds, Dr Luke Grundy, Dr Stefanie Farr, Dr Zane Stromberga** (*Bond University Alumni Members)* ***Building 6, Basil Seller Theatre***					
1100 - 1130	*Morning Break* ***Building 5, Level 3 Foyer***					
1130 – 1300	**CONCURRENT SESSION 1**					
	Stream 1: **Medical Ethics/General Medicine** **Chair:** Prof Mark Morgan **Co-Chair:** A/Prof Richard Matthews ***Building 5, Level 3, Room 5_3_40***	**Stream 2:** **Surgery & Procedural Skills** **Chair:** Dr Natasha Yates **Co-Chair:** Dr Lucy Grant ***Building 6, Basil Seller Theatre***	**Stream 3:** **Paediatrics/Women's Health/Geriatrics** **Chair:** Prof Peter Jones **Co-Chair:** Dr Belinda Lowe ***Building 5, Level 3, Room 5_3_53***	**Stream 4:** **Junior Doctors/Health Research** **Chair:** Dr Tracy Nielson **Co-Chair:** A/Prof Christian Moro ***Building 6, Lecture Theatre 4***	**Stream 5:** **Digital Medical Education** **Chair:** Asst Prof Carmel Tepper **Co-Chair:** Asst Prof Nicolene Lottering ***Building 5, Level 3, Lecture Theatre 2***	**Posters Ignite (Morning)** **Chair:** Asst Prof Iris Lim **Markers:** Dr Neelam Maheshwari / Asst Prof Athanasios Raikos ***Building 5, Level 3 Foyer***
1300 – 1400	*Lunch Break* ***Building 5, Level 3 Foyer***					
1400 - 1530	**CONCURRENT SESSION 2**					
	Stream 6: **Internal Medical/Emergency Medicine** **Chair:** Dr Jane Smith **Co-Chair:** Dr Matthew Links ***Building 6, Basil Seller Theatre***	**Stream 7:** **Mental Health/Stigma** **Chair:** A/Prof Jo Bishop **Co-Chair:** Asst Prof Belinda Craig ***Building 5, Level 3, Room 5_3_40***	**Steam 8:** **Biomed/Dietetics/Human Movement** **Chair:** A/Prof Kevin Ashton **Co-Chair:** A/Prof Greg Cox ***Building 5, Level 3, Lecture Theatre 2***	**Stream 9:** **Global Health/Planetary Health** **Chair:** Prof Michelle McLean **Co-Chair:** Dr Treasure McGuire ***Building 5, Level 4, Lecture Theatre 1***	**Stream 10:** **Medical Education (Technology & Simulation)** **Chair:** Prof Victoria Brazil **Co-Chair:** Asst Prof Jessica Stokes-Parish ***Building 5, Level 3, Room 5_3_53***	**Posters Ignite (Afternoon)** **Chair:** Asst Prof Kelly Menzel **Markers:** A/Prof David Waynforth / Asst Prof Adam Hope ***Building 5, Level 3 Foyer***
1530 - 1545	*Afternoon Break*					
1545 - 1630	**Awards & Closing of Conference – A/Prof Kevin Ashton** (*Facilitator, Associate Dean of Research, Faculty of Health Sciences and Medicine, Bond University)* ***Building 6, Princeton Room***					

CONTENTS

MESSAGE FROM THE DEAN

Following 2020 and the challenges presented by the Coronavirus (COVID-19) pandemic, 2021 has been a year to reflect, learn and further develop our collective and individual capabilities. The COVID-19 pandemic has affected every one of us, in various way as well as it has challenged our mindset and preferred behavioural styles to respond to the experiences presented.

As I read through the range of projects and abstracts to be presented, I am inspired by the high standard of work and diversity in thinking across a range of issues related to health and well-being you have engaged in. Your involvement in these projects allowed for diversity in experiences; an opportunity to demonstrate the value in collaboration; highlight the importance of supporting one another through challenging times; and in turn, it is reflective of the healthcare profession you are soon to be part of as junior medical doctors. I would like to acknowledge your efforts in completing your MD Project and being a part of innovate research to help tackle important issues in healthcare. While undertaking your MD Project, you will have worked with supervisors, fellow students, patients, and faculty staff who have all formed part of your project 'team'. Remember to thank them.

Congratulations on completing your MD Project and presenting your work at the 2021 HSM Medical and Postgraduate Students Research Conference. This is the start of a career-long engagement with research, either as a clinician or, for some of you, on the path to further success in medical research. Do not be overwhelmed by the enormity of what lies ahead. Instead, remember that you can make a difference, you *will* make a difference.

Professor Kirsty Forrest

MBChB, BSc Hons, FRCA, MMEd, FAcadMEd, FANZCA
Dean of Medicine
Faculty of Health Sciences and Medicine Bond University

"Research is something that everyone can do, and everyone ought to do. It is simply collecting information and thinking systematically about it." - Raewyn Connell

MESSAGE FROM THE ASSOCIATE DEAN OF RESEARCH

The HSM Medical & Postgraduate Student Research Conference is an annual celebration of student research within the Faculty of Health Sciences and Medicine. The conference enables student researchers at all levels of experience an opportunity to showcase their research discoveries. Work presented at the conference includes MD projects, Masters and PhD studies and other faculty-supervised research activities. We are in a fortunate position to be able to meet and present in person this year, although I hope by typing these words, I haven't just jinxed it.

For me, this year's research theme - 'Prism of Possibilities' highlights the importance of being receptive to change and taking advantage of different perspectives. The prism changes the way that we view light, hopefully Bond has been that prism for you. Showing what you are capable of and equipping you with the tools and knowledge to fulfil those capabilities.

The diversity of research topics is a real strength of this conference and congratulations to each one of you on the progress you have made. Especially given the constant challenges the modern world is throwing at us all, one that rapidly changed many aspects of daily life. But through this, every student has continued to adapt to the situation, collaborate in new ways and further develop their skills in research.

I wish everyone a great conference and thank you for bringing out the best in our university.

Assoc/Prof Kevin Ashton

Associate Dean, Research
Faculty of Health Sciences and Medicine Bond University

"If you feel safe in the area you're working in, you're not working in the right area. Always go a little further into the water than you feel you're capable of being in. Go a little bit out of your depth. And when you don't feel that your feet are quite touching the bottom, you're just about in the right place to do something exciting."
– David Bowie

CONFERENCE ORGANISING COMMITTEE

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Saumya Chanana - Medical Student Representative
Wisura Mudiyanselage - Medical Student Representative
**Special thanks to Ms Amanda Tauber - HDR Representative*

We would like to acknowledge and thank all Supervisors and Bond Academic Staff who voluntarily supervised these projects. Without your support and guidance, these projects would not have come to fruition.

We also acknowledge and thank our academic and professional staff who have greatly assisted the organisation of this conference. Thank you all.

OP1: "We're the ones who need to speak up": Patient advocates' views of the patient experience and role in interprofessional collaborative practice in primary care: A constructivist grounded theory study.

Davidson, Alexandra R, PhD Candidate, Faculty of Health Sciences and Medicine, Bond University
Morgan, Mark, Professor of General Practice, Health Sciences and Medicine, Bond University
Ball, Lauren, Associate Professor, Menzies Health Institute Queensland, Griffith University
Reidlinger, Dianne P, Associate Professor Dietetics and Nutrition, Faculty of Health Sciences and Medicine, Bond University

Background

Primary healthcare for chronic conditions is best managed by a team of healthcare professionals. Interprofessional collaborative practice (IPCP) involves two or more healthcare professionals working together with the patient, their family, carers, and communities to provide high-quality care. Patient advocates are an important stakeholder as they represent patient population groups in relation to healthcare policy and practice. This qualitative study aimed to explore the perceptions of patient advocates on the patient role in IPCP for chronic disease management in primary care.

Methods

This constructivist grounded theory focus group study included patient advocates from Australian Organisations who represent patients with chronic conditions in primary care. Videoconference focus groups were recorded, transcribed verbatim and thematically analysed using the five-step approach of Charmaz: (1) Initial line-by-line coding, (2) Focused Coding, (3) Memo writing, (4) Categorisation and (5) Theme and sub-theme development.

Results

Three focus groups with 17 patient advocates with various cultural and professional backgrounds participated. Six inductively developed preliminary themes describe the perceived patient roles in IPCP in primary care. The first three themes described factors influencing the patient role: (1) Playing the patient role, (2) Spectrum/Sliding scale of patient role, (3) Structures underpinning roles. The second three themes described three key roles that patients may play across their healthcare journey (4) Centralising the patient role, (5) Participating in paternalistic healthcare and (6) Disconnecting patient role.

Conclusion

The diversity across the six themes representing perceptions of patient advocates on the patient role in IPCP in primary care highlights the challenges of chronic disease management. Further investigation of the
individual healthcare experiences of patients with chronic diseases and other key players including, health professionals, family, and carers is needed.

OP2: Carers' experiences and perceived roles in Interprofessional Collaborative Practice in primary care: A constructivist grounded theory study

Zigori, Bekhinkosi D, HSM postgraduate student, Master of Nutrition and Dietetic Practice Alumni, Faculty of Health Science and Medicine, Bond University
Davidson, Alexandra R, PhD Candidate, Faculty of Health Sciences and Medicine, Bond University
Gala, Devanshi, Dietician, Faculty of Health Science and Medicine, Bond University
Reidlinger, Dianne, Associate Professor of Nutrition and Dietetics, Faculty of Health Sciences and Medicine, Bond University.

Background

Chronic conditions are a significant health issue worldwide and in Australia. Chronic conditions often lead to physical, cognitive and social decline, thus, increasing an individual's dependence on carers who assist with activities of daily living. Interprofessional Collaborative Practice (IPCP) is an optimal model of care to manage individuals with chronic conditions in primary care. However much less is known about the experiences and perceptions of these carers regarding their involvement in IPCP. This study aimed to explore the experiences and perspectives of carers of their involvement in IPCP when caring for individuals with chronic conditions.

Method

The researchers utilised aspects of constructivist grounded theory methodology. Informal, family carers were recruited through another qualitative study and professional networks. Semi-structured interviews were conducted via videoconference, tape recorded and transcribed before undergoing the five-step data analysis by Charmaz: were utilised including 1) initial line-by-line coding, 2) focused coding, 3) theoretical coding, 4) reflexive memo writing and 5) theoretical sampling.

Findings

Two themes were developed 1) Stepping in for the care recipient (subthemes: holding on to independence; learning as you go; consulting with healthcare providers on behalf of care recipient) and 2) Caregiving roles in team care subthemes: living in the role; standing up for the care recipient; feeling obligated to be involved in team care; changing the relationship dynamics). The following recommendations were developed to improve IPCP from the carer's perspectives: 1) 'increasing consultation time' with healthcare providers and 2) 'acknowledging the carer's experience'.

Conclusion

This study contributes to research on carers for individuals with chronic conditions by providing insights on their experiences and perspective regarding their involvement in team care. Healthcare providers can utilise the recommendations as a practical framework to strengthen the carer's involvement in IPCP.

OP3: Effect of different visual presentations on the comprehension of prognostic information: a systematic review

Abukmail, Eman, HDR Student, Institute for Evidence-Based Healthcare, Faculty of Health Sciences and Medicine, Bond University

Bakhit, Mina, Institute for Evidence-Based Healthcare, Faculty of Health Sciences and Medicine, Bond University

Del Mar, Chris, Professor, Institute for Evidence-Based Healthcare, Faculty of Health Sciences and Medicine, Bond University

Hoffman, Tammy, Institute for Evidence-Based Healthcare, Faculty of Health Sciences and Medicine, Bond University.

Background

Understanding prognostic information can help patients know what may happen to their health over time and make informed decisions. However, communicating prognostic information well can be challenging. This systematic review aims to identify and synthesize research that has evaluated visual presentations that communicate quantitative prognostic information to patients or the public.

Method

We searched 6 databases using a combination of subject headings and free text words: MEDLINE, EMBASE, CINAHL, PsycINFO, ERIC, and the Cochrane Central Register of Controlled Trials (CENTRAL) (from inception to December 2020), and forward and backward citation search. Two independently screened search results, assessed eligibility, assessed risk of bias, and extracted data. To be eligible, studies required a quantitative design and comparison of at least one visual presentation with another presentation of quantitative prognostic information. The primary outcome was comprehension of the presented information. Secondary outcomes were preferences for or satisfaction with the presentations viewed, and behavioural intentions.

Results

Eleven studies (all randomized trials) were identified. Heterogeneity in the visual presentations and outcome measures precluded meta-analysis. Therefore, studies were according to the presentation type evaluated. Bar graph versus pictograph (3 studies): no difference in comprehension between the groups. Survival vs mortality curves (2 studies): no difference in one study; higher comprehension in survival curve group in another study. Tabular format versus pictograph (4 studies): 2 studies reported similar comprehension between groups; 2 found higher comprehension in pictograph groups. Tabular versus free text (3 studies): 2 studies found no difference between groups; 1 found higher comprehension in a tabular group.

Conclusion

There is inconsistency about the superiority of a particular visual presentation
to be used when discussing quantitative
prognostic information with patients. Any of
the identified visual presentations in this review

may be suitable to be used to facilitate comprehension.

PR1: Expanding the palliative care toolkit: Voluntary assisted dying and the ethical considerations of incorporating psychedelic substances

Poulton, Georgina, 5th Year Medical Student, Health Sciences and Medicine, Bond University
Matthews, Richard, Associate Professor Medical Ethics, Bond University Health Sciences and Medicine

Background

Current medical practices and treatments do not always relieve suffering adequately, particularly suffering that is of an existential nature at end of life. Intolerable suffering is a subjective experience and an immeasurable concept to define, yet it lies at the heart of requests for voluntary assisted dying, a practice which is ethically divisive and may be vulnerable to misuse.

Method

A paper was produced examining the extant literature and explores the therapeutic potential of psychedelic substances to remedy suffering in cases where existing therapies fall short. Research focussed on the Australian state of Victoria where voluntary assisted dying has recently become lawful.

Results

Psychedelic assisted psychotherapy should be investigated as a favourable method of improving quality of life and as a way of potentially lessening the need to resort to voluntary assisted dying**.**

Conclusion

Given psychedelics show considerable promise and minimal harm in treating the very kind of suffering that can compel people to seek alternatives, there is an obligation for doctors to explore treatment with psychedelics prior to resorting to voluntary assisted dying.

PR2: Palliative Sedation and Voluntary Assisted Dying: Points of Ethical Difference

Hii, Isaac, 5th Year Medical Student, Health Sciences and Medicine, Bond University
Matthews, Richard, Associate Professor of Medical Ethics, Health Sciences and Medicine, Bond University

Introduction

Palliative sedation and "voluntary assisted dying" (VAD) are two end-of-life procedures that are often compared with one another. They are both used in the terminal stages of life and are measures of last resort for refractory suffering. Some claim that palliative sedation is equivalent to "slow euthanasia". The aim of this essay is to make a distinction between these two procedures, especially considering many countries and states are moving towards legalising VAD or equivalent legislation.

Method

A qualitative review of the literature was conducted to understand the current debate. Three electronic databases were searched using key terms. 36 articles were included as citeable literature for this essay.

Discussion

There are multiple points of difference between palliative sedation and VAD. These include differences in intention, intrinsic morality, definition of personhood, reversibility, proportionality, and the possibility of hastening death. These procedures are similar in that they hold to key ethical concepts such as beneficence, autonomy, and the intention to relieve suffering.

Conclusion

Ultimately, palliative sedation and VAD have different roles and are ethically distinct. Clarifying the differences between them highlights the challenges of refractory symptom management in terminal illness. Further ethical discussion around these measures of last resort is extremely important to help patients and clinicians better understand end-of-life suffering.

PR3: Designing a learning plan for a specific health workforce group: intern basics on general medicine rotation

Ketheeswaran, Keshini, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Background

Medicine has changed drastically over the years and junior doctors must be able to thrive in challenging environments. Medical education is the perfect opportunity to prepare these doctors for the career they are entering. Research shows that the ability of our healthcare system to deliver the

best possible care is highly dependent on the quality training and education of our staff.

Proposed Learning Plan:

Interns beginning the general medicine rotation are the selected workforce for this learning program The program is designed to teach these newly graduated doctors the appropriate skills required to be competent on their respective rotations. It is based on the four key findings of an Australian Medical Board survey, where interns reported feeling underprepared for certain skills including prescribing medication, nutritional care, reporting errors and seeking support for psychological distress. The entire program will be completed over a ten-week time period consisting of multiple components that include: a 30-minute education session, 5 learning modules, a one-day simulation session to solidify the knowledge learnt, and a supervision relationship throughout the rotation. The learners will also have access to an online reflection portal at the end of the course in which they will be able to share what they have learnt.

Conclusion

We have a responsibility to enhance learning strategies with the newfound digital era to provide curricula and training programs that are fit for this purpose. Medical education should be designed to equip doctors with the knowledge and clinical skills required to deliver the best possible patient care. If interns feel more prepared for their roles, they will be more inclined to succeed in the workplace.

PR4: The Ethical Implications of Artificial Intelligence – A Review of the Impact on Radiology

Chanana, Saumya, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Matthews, Richard, Associate Professor Medical Ethics, Health Sciences and Medicine, Bond University, Bond University

Introduction

The development of artificial intelligence (AI) applications in healthcare continues to grow at a rapid rate. The proposed benefits of AI use in radiology include improvements in patient care, efficiency, and health outcomes, but the ethical implications of such technology are yet to be fully evaluated.

Method

A qualitative literature review was undertaken using various search strategies on PubMed and Embase. Further relevant articles were located through a citation search that satisfied the inclusion criteria. Several articles focussing on the logistics of AI in radiology were included to ensure the ethical discussion followed a structured framework of the applications of this technology. A total of 45 articles satisfied the criteria and were included in subsequent analysis.

Results

The ethical considerations of AI have epistemic, normative, and general overarching concerns. The primary concerns are synthesised into core categories: algorithm bias, data ownership, consent, liability, and their impact on clinical practice. The hidden innerworkings of the technology, risks to core medical ethics, combined with an overall lack of community education suggests the ethical considerations outweigh the proposed benefits of AI use.

Conclusion

Despite the exciting possibilities, the ethical considerations are vast and difficult to clearly communicate to patients and clinicians. Whilst suggestions of increased efficiency and more time for patient encounters are attractive, the role of a radiologist remains critically important in maintaining a strong clinician-patient relationship. Today, the use of AI in radiology is a dangerous double-edged sword that perhaps poses more problems than it solves.

PR5: The important of contemporary neuroethics in medicine

Nge Nge, Tin Aeint, 5th Year Medical Student, Sciences and Medicine, Bond University

Matthews, Richard, Associate Professor Medical Ethics, Health Sciences and Medicine, Bond University

Introduction

The neuroethics field has expanded over the years and has immediate relevance within medicine to help doctors to navigate ethical dilemmas.

Methods

A narrative review was undertaken to explore the conceptual expansion of neuroethics in areas that overlap with medicine within the conceptual and

ethical domains, focusing on thirty-six articles that were used to detect recurring themes aligned with medicine using a thematic approach.

Results

Beyond assisting doctors to develop an appreciation for human dignity, morality, and interactions between identity, agency, autonomy, and capacity, neuroethics can also assist by helping resolve ethical dilemmas that result from technological innovation, providing tools to help fight misinformation, educating on the risks, the harms and benefits of neuro-technologies, protecting against data privacy invasions, and positively impacting public health discourse.

Conclusion

Neuroethics should be taken seriously by doctors and considered as a valuable area of professional development as new technologies and scientific knowledge rapidly develop.

PR6: Designing a Learning plan for PGY1 Junior Doctors on Emergency Medicine rotation

Prakash, Venkat, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Background

Clinical practice in the emergency department is dynamic and evolving. Therefore, the education structure for PGY1 junior doctors in Queensland Health should be equally innovative in order to effectively train the interns, improve team functioning and improve patient outcomes in the emergency department.

Learning Plan

The learning plan proposed was designed using a comprehensive framework to assess learning needs and identify the learning goals from which resources and strategies were planned to engage the learners. The health workforce for this program are intern doctors in their emergency medicine rotation. The program it is structured over ten weeks with learning activities and evaluations occurring for the entire duration of the term. The learning needs were assessed using organisational, person and task-based analysis that incorporates the requirements of the Australian Medical Council (AMC) for provisional training. The learning goals were constructed using a backwards design philosophy which established the learning activities and assessment structure based on the intended outcome expectations for the learner, organisation and healthcare users. The competency-based learning activities include: ten self-directed voice-over power-points (VOPP), a mentorship program, simulation workshops and a procedural skills log. The assessment and evaluation of learning is workplace-competency based, which was framed within the AMC's model of assessment to include peer-evaluation feedback, mentor feedback, learner self-reflection, and simulation performance.

Conclusion

Medical education in the workplace requires a reform in order to engage the junior doctors in their clinical learning and adequately train them for the dynamic challenges in the health workplace. The structure and design of the learning plan allows interns to easily identify their own needs, formulate their objectives, develop their clinical and interpersonal skills and evaluate their learning while delivering optimal care to patients.

STREAM 2: SURGERY AND PROCEDURAL SKILLS

PB1: Surgical Waste Pilot Study: Analysis of Surgical Waste Produced By Three Common Surgical Specialties Across Different Gold Coast Health Facilities

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Crayton, Aidan, 5th Year Medical Student, Health Sciences and Medicine, Bond University

McMahon, Xavier, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Pietris, James, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Maheshwari, Neelam, Associate Professor of Pathology, Health Sciences and Medicine, Bond University

Jones, Peter, Professor of Paediatrics, Health Sciences and Medicine, Bond University

Stirling, Allan, Associate Professor, Anatomy, Health Sciences and Medicine, Bond University

Mclean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University

Rathbone, Evelyne, Senior Research Fellow, Biostatistics, Health Sciences and Medicine, Bond University

Background

The Australian healthcare system accounts for 7% of Australia's total carbon footprint, with a substantial amount of this being healthcare waste.[1] Yet, the contribution of surgical waste to carbon emissions remains a major and under-recognised issue in healthcare. The aim of this study was to measure the quantity of surgical waste and calculate yearly carbon emissions for a range of common surgical procedures performed at the Gold Coast University Hospital, Varsity Lakes Day Hospital, and Gold Coast Private Hospital.

Method

Measurement of surgical waste was conducted for three common surgical specialties: Obstetrics and Gynaecology, Orthopaedics, and Ophthalmology. In theatres, waste was segregated into the five different waste streams of 'soft plastics,' 'hard plastics,' 'paper/cardboard,' 'metal and electricals,' and 'textiles.' All waste was measured in kilograms per surgery before and after segregation. Yearly carbon emissions produced by the surgeries in total was estimated based on the number of procedures performed per year.

Results

Waste measured from 44 procedures including 21 Cataract Surgeries, 10 Lower Segment Caesarean Sections (LSCS), 6 Standard Vaginal Births (SVBs) and 7 Orthopaedic Disc Replacement Surgeries, yielded a total of 202.822 kilograms of waste. The estimated yearly waste for all surgeries was 19,372.357 kilograms. The calculated yearly carbon emissions for all surgeries combined was 28.913 tonnes CO2-e.

Conclusion

These data reiterate the substantial contribution of surgical waste towards Australia's total carbon footprint. Observations from this study highlight several concerning waste disposal practices and proposes measures including the "5Rs" principle to mitigate waste and reduce surgery's carbon footprint.

References:

1. Malik A, Lenzen M, McAlister S, McGain F. The carbon footprint of Australian health care. The Lancet Planetary Health. 2018;2(1):e27-e35.

PB2: Factors affecting choice of contralateral prophylactic mastectomy and breast reconstruction in women with breast cancer: A Prospective Qualitative Interview Study

Natani, Anusha, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Chou, Crystal, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Ho, Claudia, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Liang, Rhea, General and Breast Surgeon, Robina Hospital, Gold Coast Health

Youngberg, Rhys, Surgical Registrar, Queensland Health

Background

A breast cancer patient's decision-making journey for contralateral prophylactic mastectomy (CPM) and breast reconstruction is multifactorial and complex. Despite the negligible survival benefit as reported in existing literature, there has been an increase in CPM rates. Whilst there have been studies on the importance of shared decision-making, the effects of patients' beliefs on CPM shared decision-making have not been explored in detail. The primary purpose of this study is to improve future patient informed shared decision making and overall understanding of this field of study.

Method

This is a qualitative interview study recruiting women with newly diagnosed unilateral breast cancer from Southeast Queensland Health breast cancer clinics. Participants were engaged in semi-structured interviews via a phone call to discuss their treatment choices. Interview transcripts were thematically analysed and coded to identify common themes, and the resulting data were integrated and compared with existing literature.

Results

Findings from the study confirmed factors and introduced new themes including pre-existing patient beliefs, trust in a treating clinician, patient-clinician communication, fear regarding recurrence risk, body image or sexual wellbeing, and reluctance for an invasive procedure. These factors are consistent with existing literature and have a significant role in a breast cancer patient's decision-making regarding treatment choices.

Conclusion

This study recognizes that breast cancer decision-making is multi-faceted and based on the individual's beliefs and experiences. The study suggests a need for improvements in shared decision-making and patient education to achieve adequate health literacy and ensure satisfactory patient care.

PR7: Sentinel lymph node biopsy practices in cutaneous melanomas of the head and neck

Mao, Derek, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Goel, Sahil, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Rathbone Evelyn, Senior Research Fellow, Biostatistics,Faculty of Health Sciences and Medicine, Bond University

Smith Janie D, Professor of Innovations in Medical Education, Health Sciences and Medicine, Bond University

Sawhney Raya, Director of Plastic Surgery, Gold Coast Health

Background

Sentinel lymph node biopsy (SLNBx) is a well-established procedure for the surgical management and prognostication of cutaneous melanomas. A large proportion of cutaneous melanomas diagnosed in Australia occur in the head and neck region. This region has complex lymphatic drainage patterns to multiple nodal basins which raises technical challenges for SLNBx. Given this, emerging literature has questioned the validity of SLNBx as a prognostication tool specifically in head and neck cutaneous melanomas.

Method

This retrospective observational study assessed the baseline characteristics of head and neck melanoma patients via a retrospective chart review in conjunction with analysis from SPSS.

Results

Out of 87 participants in the study, only 5 underwent SLNBx despite 16 being eligible for the procedure. On demographic analysis, there was a statistically significant association between smoking status and invasive (Tumour stage T1 and above) cutaneous head and neck melanoma.

Conclusion

This study demonstrates that smoking status is an important risk factor for HNM. It further outlines the low use of SLNBx techniques in the prognostication of HNM. When combined, the study reaches the recommendation that smoking status be considered in the initial workup of the melanoma and potentially prompt surgeons to undertake SLNBx given their higher published rates of lymph node metastasis and associations with higher stages of invasive melanoma.

PR8: Development of an implementation protocol to increase the use of floating craniotomy for raised intracranial pressure at GCUH

Kia, Elahe, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Knowledge Practice Gap

Traumatic brain injury and stroke are common causes of dangerously elevated intracranial pressure. Traditional management with decompressive craniectomy is associated with high morbidity and mortality, requiring a secondary cranioplasty to correct skull defects. The hinge, or floating-anchored, craniotomy offers an alternative means of cranial decompression, avoiding subsequent cranioplasty and offering additional hypothesised advantages. However, utilisation is limited to few surgeons within GCUH.

It is proposed that lowering the local burden of traumatic brain injury and stroke could be achieved through increased use of the floating craniotomy throughout the GCUH neurosurgical department. A behaviour change implementation strategy, guided by the Knowledge to Action Cycle, is presented below.

Identifying Barriers to Change

Limited access to primary target stakeholders (neurosurgical consultants) necessitated a hypothetical assessment of local context. The COM-B model was used to identify barriers and facilitators to the proposed behaviour change. Normalisation Process Theory helped evaluate organisational readiness. A 3-phase implementation initiative was designed to guide planning, implementation, and evaluation of the project at GCUH.

Implementation and Evaluation

The generated Implementation Research Logic Model consists of pre-implementation,

implementation, and post-implementation phases, spanning 44 weeks. Logic model components: inputs, activities, outputs, outcomes (short, medium, long-term), impact, assumptions, and external influences were addressed. Activities focused on increasing user education and buy-in. A monitoring plan took reference from SAGES Guidelines. The NHS Sustainability Model identified target areas for project sustainability.

Conclusion

The Knowledge to Action Framework provides a strategic approach for behaviour change project development, implementation, and evaluation planning which can be applied to the GCUH neurosurgical setting.

References

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Gutman, M. J., How, W., Withers, T. (2017). The floating anchored craniotomy. Surgical Neurology International, 8, 130. https://doi: 10.4103/sni.sni_460_16

Stefanidis, D. Fanelli, R. D., Price, R., Richardson, W. (2014). SAGES guidelines for the introduction of new technology and techniques. Surgical Endoscopy, 28, 2257-2271. https://doi: 10.1007/s00464-014-3587-6

PR9: Professional Project: Foundations of Teaching

Leal, Katey, 5th Year Medical Student, Health Sciences and Medicine, Bond University

McLean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University

Stirling, Allan, Associate Professor Anatomy, Health Sciences and Medicine, Bond University

Introduction

The emphasis on students acquiring teaching skills during medical school is based on a number of important purposes that benefit the teacher, the learner and the institutions. These purposes include the requirement of junior doctors to teach medical students, as well as expectations of speciality programs to engage in teaching and positive development of skills for both the teacher and learner. For these reasons, many educators recommend that teaching skills should be introduced during medical school as a precursor to teaching responsibilities as a doctor. This paper describes the foundations of teaching and the creation of an educational resource as part of a professional MD project, conducted in final year medicine.

Method

Two principal project outputs were undertaken to achieve the learning objectives of the MD project. (1) Undertaking the Essential Skills in Medical Education online course. (2) Creating an educational resource relevant for medical students, comprising of ten common surgical case studies.

Conclusion

Throughout the completion of the ESME course and creation of my educational resource, I have built knowledge and skills that are invaluable for my future career in medicine. I believe I was able to achieve my proposed learning outcomes based on the theory of the foundations of teaching and development of my educational resource. I would encourage other medical students to further their learning about medical education.

PR10: Designing a learning plan for a specific health workforce group: Medical student education

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Background

Medical school education is constantly evolving to better suit the learning needs of its students. Research has shown that by the time medical students enter the workforce they lack confidence and are underprepared to perform basic procedural skills. Thus, a learning plan has been constructed to upskill and prepare medical students entering the health workforce.

Proposed Learning Plan

The design outlines a seven-day intensive course to prepare medical students in procedural skills competency and level out any discrepancies in ability. It utilises various learning strategies and modalities of education delivery to cater to various learning types and maximise efficacy of teaching. In keeping with Knowles theory of adult learning, the course incorporates the needs of everyday life to motivate learners to engage and utilise resources provided. Other methods include a mixed model of

online modules and face-to-face components in keeping with the latest research into effective teaching and learning. Additionally, Kolb's model of experiential learning proposes that learning is maximised and solidified with hands on experience, hence the incorporation of simulation into the learning plan. Groups will be kept small to encourage collaboration and teamwork when solving clinical problems emulating the everyday environment working in a hospital.

Conclusion

These are exciting times for medical education with an abundance of clinical resources available to students. Research into the most effective learning strategies and methods have been considered to design a learning plan to prepare final year medical students entering the workforce.

PR11: The Effectiveness of Early, Unrestricted Exercise Program Rehabilitation on Upper Limb Function in Women Undergoing Breast Cancer Surgery: A Systematic Review and Meta-Analysis

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Jones, Cindy, Associate Professor, Health Sciences and Medicine, Bond University

Introduction

Shoulder range of movement (ROM) restrictions are common in women following breast cancer surgery. To reduce the likelihood of these occurring, ROM exercises are prescribed routinely. The optimum timing to begin these exercises is not clear, so the aim of this project was to evaluate the effectiveness of early ROM exercises to delayed ROM exercises which is usual care.

Method

Cochrane Central Register of Controlled Trials, PubMed, EMBASE, CINAHL, and PEDro were searched from the date of inception until the 15th of February 2021, to identify randomised controlled trials (RCT's) that compared early, unrestricted ROM programs to usual care. 21 articles (2442 participants) were eligible for inclusion. Outcomes assessed included wound outcomes, shoulder ROM + lymphoedema incidence. Risk of bias was assessed using the PEDro score. A sensitivity analysis for studies with low risk of bias (PEDro score >6/10) and publication after the year 2000 was also conducted, along with the Grades of Recommendation, Assessment, Development and Evaluation (GRADE) framework analysing intervention and control groups.

Results

Total drainage volume and drainage time were significantly greater in the early ROM group (114.57mL [35.53,193.60] and 0.95 days [0.38,1.52], respectively), but these differences were not significant following sensitivity analyses. Shoulder ROM outcomes could not be meta-analysed due to high heterogeneity. No difference was found between groups for lymphoedema incidence. The GRADE framework revealed the quality of evidence was generally low to very low between intervention and control groups.

Conclusion

Further research is recommended to accurately determine the ideal timing of exercises to minimise poor functional outcomes.

PR12: Transcutaneous Electrical Nerve Stimulation (TENS) to reduce posterior neck pain following thyroidectomy in adults and children

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Rationale

As the final assessment piece for the Bond University Systematic Review - Master of Healthcare Innovation subject, a systematic review protocol was developed. The protocol evaluates the use of Transcutaneous Electrical Nerve Stimulation (TENS) to reduce posterior neck pain following thyroidectomy in adults and children.

Background

During thyroid surgery, to achieve adequate neck exposure the patient is positioned in prolonged full neck extension. As a result, posterior neck pain is often experienced by patients postoperatively. TENS is a non-invasive, safe and inexpensive method of pain relief, whereby electrical impulses are sent via electrodes. The use of TENS has been effective in reducing postoperative pain following cholecystectomy, cardiac surgery, caesarean section and thoracotomy. Research has been encouraging for its application during thyroidectomy.

Methods

A systematic review will be conducted for randomised controlled trials (RCTs). PubMed, Cochrane CENTRAL, MEDLINE and Embase will be searched. Clinical trials and bibliographies will be searched, and experts in the field will be contacted. Primary outcomes will include pain severity (pain scale) and presence / absence of severe pain. Study selection will be performed in duplicate using Preferred Reporting Items for Systematic reviews and Meta-Analysis (PRISMA) guidelines. Studies will be appraised using the Cochrane Handbook for Systematic Reviews. Data will be pooled in meta-analysis if statistically homogenous. Measures of treatment effect will be presented as risk ratios and mean differences. Subgroup and sensitivity analyses will be performed where relevant. Overall quality of evidence will be assessed using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) approach.

References

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STREAM 3: PAEDIATRICS WOMEN'S HEALTH GERATRICS

PB3: The efficacy of telepresence robots on improving psychosocial health and wellbeing in older adults: An integrative review

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Jones, Dominique, PhD Candidate, Faculty of Health Sciences and Medicine, Bond University

Background

The development of telepresence robots as a conduit for social connectedness in the elderly is a topic of growing interest. Contemporary literature corresponding to the effects of these robots on psychosocial health and wellbeing is scant. As such, this paper presents an integrative review of existing literature to assess the efficacy of telepresence robots on improving psychosocial health and wellbeing in older adults.

Method

A systematic search of Medline, ProQuest, PubMed, Scopus, Web of Science, CINAHL, EMBASE, and the Cochrane library was conducted, gathering available evidence on the use of telepresence robots, specifically videoconferencing, to improve social connectedness, in older adults. Studies included in the review underwent processes of methodological quality assessment (Mixed Methods Appraisal Tool–Version 2018), data extraction and narrative syntheses.

Results

A review of 1,485 records, identified four eligible peer-reviewed publications, reporting findings about three different mobile telepresence robots. The study designs included qualitative and mixed methods approaches, focusing primarily on examining the feasibility and acceptability of the telepresence robots within the context of dementia care. Positive outcomes included improved social interaction with carers while barriers - such as a lack of familiarity with robot use and minor technological shortcomings – were encountered.

Conclusion

Despite limited available literature, the four studies included in this review suggest these novel technologies are accepted by elderly users and can facilitate social interaction with carers. Due to obvious methodological limitations, more robust studies are needed to inform the efficacy of telepresence robots on improving psychosocial health and wellbeing in older adults.

PR13: Women who decline breast cancer treatment – reasons, outcomes and possible interventions: a retrospective matched case-control study

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Harding, Ashley, Clinician, Gold Coast University Hospital
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Vuksanovic, Dean, Clinician, Gold Coast University Hospital
Bannatyne, Amy, Assistant Professor Behaviour Sciences, Health Sciences and Medicine, Bond University.

Introduction

The rate of declining recommended conventional breast cancer treatments is rising. This qualitative and quantitative study aims to explore the considerations involved in one's decision to decline breast cancer treatments and its implications on their physical, psychological, social practical needs as well as to investigate the impact of these decisions on seeking further medical assistance.

Methods

This study includes 242 women diagnosed with breast cancer from the Gold Coast Hospital Health Service (GCHHS) breast multidisciplinary team. 121 women declined at least one modality of recommended breast cancer treatments. Each of these women were matched, via age and stage of breast cancer, with a woman who accepted all recommended treatments. Several analysis methods, including Levene's Test for Equality of Variances and T-test for Equality of Means, were employed to investigate whether those who declined treatment still sought further medical assistance. Qualitative interviews of 3 women were undertaken to explore the considerations involved in one's decision to decline breast cancer treatments. This is still in process.

Results

83% of the decline group declined chemotherapy. However, 95% of the decline group accepted at least one conventional treatment and continued to engage with health appointments in GCHHS. The decline group attended more Pain Specialist Clinics (1.63 95%CI [0.59,2.69] v 0.21 95%CI [0.11,0.32]) and were less engaged with Oncology. (13.36 95%CI [10.74,15.99] vs. 17.52 95%CI [14.44,20.60]).

Conclusion

Subconscious bias, in labelling patients who decline recommended treatments as "difficult", must be addressed and an effort to understanding the decision-making process behind choosing to accept or decline treatment must be made. Empathy and improving health literacy of our patients is integral when offering medical care.

LP1: A systematic review comparing the prognostic outcomes of children and adolescences diagnosed with autism spectrum disorder early compared with later

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Introduction

Early detection of autism spectrum disorder (ASD) and subsequent early interventions reportedly produce better outcomes. Yet the paucity of evidence supporting this demonstrates the need to explore whether the timing of diagnosis (early versus later) impacts the prognosis for individuals, especially those who present with milder symptoms. This systematic review aims to explore the similarities and/or differences of prognostic outcomes of individuals diagnosed early compared with later in childhood.

Method

We systematically searched, four electronic databases (PubMed, PsychINFO, EMBASE, and CINAHL) from inception till March 2021. Prognosis studies were included if participants received an initial ASD diagnosis at baseline, followed for more than 12-months, and quantitatively reported both baseline and follow-up outcomes -psychosocial, cognitive, language, and employment. At each screening stage, two reviewers screened 10% of retrieved studies. One reviewer screened the remaining studies once interrater reliability was >0.8. The primary analysis will compare prognostic outcomes of individuals diagnosed with ASD to those diagnosed early (≤5.0 years old) and later (≥5.0 years old).

Results

The review is at the data extraction and risk of bias assessment stage. Searches retrieved 9,250 studies. Following deduplication, 5,541 titles were screened, and 248 full texts were reviewed. To date 55 prognostic studies are included. A quantitative synthesis grouping the results into participants diagnosed early (≤5.0 years old) compared with late (≥5.0 years old) is planned. The standardised mean differences of the prognostic outcomes between the two groups will be calculated.

Conclusion

Early diagnosis and intervention for children suspected of having ASD are considered essential for optimal outcomes. However, it is unclear whether prognostic outcomes of children diagnosed with ASD early versus later in childhood differ. Outcomes from this review, will add to current understandings of the timing of an ASD diagnosis (early versus later) and if this impacts prognostic outcomes.

PR14: Surgical versus outpatient large loop excisions of the transformation zone: a retrospective chart audit of gynaecological practices at the Tweed and Murwillumbah Hospitals

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Green, Patricia, Assistant ProfessorClinical skills, Health Sciences and Medicine, Bond University

Background

Large loop excisions of the transformation zone (LLETZ) are performed to treat precancerous abnormalities of the cervix in the operating theatre (OT) or outpatient clinic (OPD), with general (GA) or local anaesthetic (LA). GA may be elected if a patient prefers this due to anxiety or if a clinician anticipates a complex procedure or an additional gynaecological surgery. Unlike the United Kingdom and New Zealand public health regulatory bodies, Australian National Health Medical Research Council do not currently recommend one anaesthetic modality over the other despite evidence suggesting no significant differences in specimen quality or post-procedure complications. This audit aimed to evaluate if there was a significant difference in these outcomes between GA versus LA and OT versus OPD LLETZ at the Tweed and Murwillumbah Hospitals.

Method

A retrospective chart review was conducted on 297 patients who had LLETZ procedures from July 2015 to June 2020. Specimen data was extracted from histological reports and post-procedure complication rates were determined by reviewing post-operative surveys. Chi-squared tests were used for categorical variables, standard deviation for non-skewed continuous variables and means for skewed continuous variables.

Results

There was no significant difference between the OT GA, OT LA and OPD LA groups in frequency of endocervical margin involvement ($p = 0.442$), specimen depth ($p=0.57$), specimen fragmentation ($M=1$) and rates of post-operative bleeding ($p=0.086$), infection ($p=0.385$) or pain.

Conclusion

Shifting to a predominantly OPD-based treatment should be considered to improve efficiency and minimise expenditure without compromising patient safety or specimen quality.

PR15: Improving macroscopic assessment of placental membrane translucency by using an examination line/bar chart and association with histological chorioamnionitis

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Background

Chorioamnionitis is an ascending intra-amniotic infection of the placental membranes and can result in significant maternal and neonatal adverse outcomes. It is often clinically silent and requires histopathological diagnosis, which may delay timely treatment. Histologic chorioamnionitis is traditionally associated with opaque placental membranes; however, there is currently no objective method of measuring membrane translucency.

Aim

To develop an objective tool for diagnosis of chorioamnionitis by studying placental membrane translucency.

Method

This pilot study was carried out in a tertiary hospital setting over a period of one month in 2021. There were five separate tools which were used in visualising placental membrane lucency which were submitted for histological examination. The Amsterdam criteria was used for microscopic diagnosis. Sensitivity and specificity were calculated, and a receiver operating characteristic analysis was performed for diagnostic ability of the tools.

Results

A total of thirty placental membranes were included in the data analysis. The histological prevalence of chorioamnionitis was 13.3% between stage two and stage three of the Amsterdam criteria, as stage one was classed as acute subchorionitis. Tool 1 demonstrated the best diagnostic performance and produced a sensitivity of 75% and specificity of 69.2%.

Conclusion

There was a clear correlation between the placental membrane translucency using the gradient tools, particularly Tool 1 and histological diagnosis of chorioamnionitis. However, further study is warranted with a larger sample size. There is a future potential for this tool to be used in limited resource settings for diagnosis of chorioamnionitis and introduction into routine care after delivery in any hospital setting.

PR16: Foundations of Teaching

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McLean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University

Introduction

All health professionals have educational roles and learn from their peers throughout their careers. This paper will demonstrate my immersion into this project through the Essential Skills in Medical Education (ESME) program with the aid of my experienced supervisors. The success of this project is evident by the completion of the learning outcomes developed prior to starting on this project.

Method

I examined different research mediums on the topic of 'Paediatric Examinations' using, online resources, textbooks and by exploring different software options to create the resource. This was aided by first completing the ESME course.

Outputs

There are three main outputs of this project - the ESME course, a video, and an interactive quiz for students to complete.

Conclusion

This project impacted my own learning based on the achievement of the Learning Outcomes through the resource developed. Each learning outcome was explored in depth, reflecting on how they were achieved and what I have personally gained from this project.

PR17: Newborn Care Unit: reducing chronic neonatal lung disease via clinical practice improvement bundle.

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Background

Bronchopulmonary dysplasia (BPD), or chronic neonatal lung disease (CNLD) remains the most common complication of prematurity. It is clinically defined as a requirement of oxygen supplementation either at 28 days postnatal age or 36 weeks postmenstrual age. Although significant advancements in prevention and intervention have been made, its long-term disease burden and associated co-morbidities remain unchanged. Current interventions include ventilatory support, steroid therapy, exogenous surfactant, diuretics and caffeine.

Methods

A literature review was undertaken using PubMed, Cochrane and Google Scholar, to explore the current standardised clinical practices globally. This was followed by an audit from 2019-and2020 at the GCUH Neonatal Intensive Care Unit (NICU) to determine the local incidence of BPD and its associated variables. A clinical practice bundle was

then created to facilitate standardised care to all BPD patients within the GCUH NICU.

Results

The data showed an expected inverse relationship between gestational age (most important risk factor) and BPD incidence. Home oxygen requirement was directly correlated with duration of intervention and both parameters were viewed as indicators of severity and morbidity.

Conclusion

Although mortality rates have improved considerably with the evolving management of BPD, there is still potential for more effective methods of primary prevention andand secondary management as highlighted by the literature and the audit data. With the new evidence-based clinical practice bundle, we hope to establish consistent and effective care to all BPD patients so that disease burden can be minimised, and health outcomes can be maximised.

LP2: Health and social care professionals' knowledge andand attitudes towards later life sexuality in older people living with and without dementia: A multi-phase study

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Bannatyne, Amy, Assistant Professor Behavioural Science, Health Sciences and Medicine, Bond University

Horne, Maria, Associate Professor of Community andand Public Health, School of Healthcare, University of Leeds

Aim

This study aims to develop a valid and reliable assessment tool to examine knowledge and attitudes towards later life sexuality held by health and social care professionals (HSCPs) who are involved in the care of older people and those living with dementia and identifying as lesbian, gay, bisexual, transgender, intersex or queer/questioning (LGBTIQ+) individuals.

Method

This multiple phase study was designed to facilitate tool development using the Delphi technique; a pilot study to test and establish the psychometric properties of the assessment tool, and a national survey investigating HSCPs' knowledge and attitudes towards sexuality in older people including those living with dementia and identifying as LGBTIQ+ individuals. Feasibility testing of use of the assessment tool in an educational intervention will then be conducted to inform practice change.

Expected outcomes

This presentation will outline the research protocol of this multiple phases study. It is expected the study outcomes will not only lead to a new assessment tool but also provide an insight into the existing knowledge and attitudes of HSCPs to inform future educational and professionals development opportunities. This will enable the facilitation of a care environment that is supportive and understanding of the expression of sexual needs and preferences by older people living with/(out) dementia, as well as those from the LGBTIQ+ community. The use of the newly developed assessment tool will better identify training needs for clinical practice, education, policy and guidelines development and future research.

STREAM 4: JUNIOR DOCTORS HEALTH RESEARCH

PR18: Learning Plan for Intern Doctors

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Introduction

In Australia, medical school graduates complete a one-year internship to be registered with the Medical Board of Australia. During completion of Bond University's Masters of Healthcare Innovation subject, *Educating the Health Workforce in the 21st Century,* a learning plan for intern doctors was thoughtfully designed based on learning needs of interns and the expectations of healthcare users. Enabling high-value care from internship will likely form safe habits and inform future practice, leading to high-value patient care long-term.

Design

This project plan identified the learning needs and goals of medical interns, investigated the strategies to engage learners and methods to assess the cohort. The learning goals were focused in the areas of professionalism such as teamwork, support in the form of mentorship and supervision, in addition to clinical skills and patient safety. The adult learning theory, Kolb's experiential learning theory, and the workplace learning theory were referenced in the design process.

Project Output

Learning strategies included promoting effective relationships with mentors and supervisors and utilising a variety of education resources and sessions. Delivery modalities of education resources included practical skills sessions, teamwork activities, medical simulations and online resources such as video and voice-over PowerPoint presentations. Assessment strategies incorporated in the plan were feedback based through clinical supervisors.

Conclusion

Internship is an integration of supervised practice and training. This learning plan has taken an approach to target the training of interns from various domains, including clinical skills, promoting effective communication and facilitating structured supervision and mentorships. High-value care from perspectives of healthcare users and healthcare systems was considered throughout the design of this plan.

PB4: Horse sense: equine assisted learning for medical students

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Bishop, Jo, Associate Professor, Health Sciences and Medicine, Bond University

Background

Non-technical clinical skills including non-verbal communication play a significant role in the doctor-patient interaction and are crucial to the provision of high-quality, safe, and effective patient care. These skills are not routinely assessed in medical schools, resulting in a lack of feedback and limited opportunities for medical students to explicitly develop these skills. It is recognised, however, that no standardised assessment tool has been developed to accurately evaluate these skills.

It has been suggested that equine-assisted learning (EAL) of non-technical skills could be used to fill the current void in medical school curricula. Horses may act as effective substitutes for patients in the teaching of these critical skills.

Our purpose was to explore whether EAL could be used to improve medical student's non-technical skills through the observation of inter-species and cross-species interactions.

Method

Four independent scoping literature reviews were conducted to explore the current literature relevant to developing an EAL assessment tool for medical students. Database searches on Pubmed, Ovid, Embase and psycINFO were conducted and grey literature was also utilised.

Results

The literature confirmed horses' sensitivity to non-verbal communication, facilitating their interpretation of the valence of all interactions. Furthermore, expressions of empathic non-verbal behaviours ensured positive therapeutic relationships in doctor-patient interactions. Currently, no globally validated assessment tool evaluating non-verbal communication skills or other non-technical skills, such as situational awareness, vigilance, observation and attention to detail, exists.

Conclusion

Given these results, further research is required into the development of assessment tools for non-technical clinical skills and the incorporation of EAL within medical school curricula.

PR19: Efficacy of Garcinia Cambogia (HCA) in reducing body weight in overweight and obese adults: A Scoping Review

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Harvey, Ken, Adjunct Associate Professor, Institute for Evidence-Based Healthcare, Bond University

Background

Consumers expect that medicine available for purchase over-the-counter have had their quality, safety and efficacy assured by the Therapeutic Goods Administration (TGA). Whilst this is the case for registered products (labelled AUST-R), it is not the case for listed complementary medicines (labelled AUST-L). The TGA regulates listed products by a light-touch system that trusts medicine sponsors to obey the rules.

Objective

This scoping review investigates the weight loss claims made by listed products containing Garcinia Cambogia, from which hydroxycitric acid (HCA) is thought to be the active component. Examples include: Garcinia Max (AUST L 266921) (1) and Thinco Garcinia Supreme (AUST L 213557)(2).

Method

Only studies that compared Garcinia Cambogia to placebo were included and the variables of weight change and BMI change were analysed. Double-blinded Randomised Control Trials (RCT's) and systematic reviews of RCT's were included in the analysis.

Results

Of the 14 included studies, all failed to demonstrate a clinically significant decrease in weight or BMI. Thus, none of the included studies provides sufficient evidence to support the claims made by listed weight-loss products containing Garcinia Cambogia (HCA).

Conclusion

It is clear that there is a large problem with the standardisation of herbal products in general. Future trials, if done, need to have parameters matching those set out in the TGA evidence guidelines and the CONSORT guidelines for reporting randomized controlled trials of herbal interventions (3).

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PR20: Foundations of learning and teaching: Emergency medicine cases and an approach to common clinical conditions – an interactive resource

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McLean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University
Nielson, Tracy, Assistant Professor, Health Sciences and Medicine, Bond University

Background

The role of the doctor as an educator has become an increasing responsibility in clinical practice. Ensuring that medical students understand pedagogical approaches to learning is therefore important. This Professional Project allowed us to learn about educational approaches that bridge the gap between theoretical knowledge and clinical practice. Through completing the online Essential Skills in Medical Education (ESME) course, we were able to learn the fundamental basics of teaching and then apply these principles to create a resource for clinical year students.

Method

The ESME Course was completed to lay the foundations for medical education. We collaborated to decide on the software to be used

and the general format of how the patient scenarios would be developed. Independently, we each generated 10 interactive clinical scenarios based on common clinical presentations in the emergency department. The resources used were PowerPoint, iSpring Free and the cases were published using Github.

Project Outcomes

The ESME Certificate in Medical Education was awarded following course completion. Two resources, each with 10 interactive cases were produced for medical students in their clinical years which is free to use and able to be shared. This is available on the Bond Medical Community site.

Conclusion

This project laid the foundations of learning and teaching in preparation for a future educator role. It also allowed us to learn about different educational approaches and ways in which learning can be made more effective and engaging.

OP4: Automation of duplicate detection for Systematic Reviews

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Forbes, Connor, Software Developer, Institute for Evidence-Based Healthcare, Bond University
Greenwood, Hannah, Research Assistant, Institute for Evidence-Based Healthcare, Bond University

Background

Systematic reviews (SRs) are considered the best way to answer a research question. However, they are resource intensive, taking on average, five staff, 67 weeks to complete [1] at an average cost of USD $141,000 [2]. To overcome this resource burden, systematic review automation (SRA) tools have been developed to improve the speed of SR tasks, without compromising quality [3]. A time-consuming task is to remove duplicate records from search results. This can take even experienced searchers hours to complete. We have designed an SRA tool “the Deduplicator” with the goal of greatly speeding up this process.

Method

To evaluate the Deduplicator we will compare deduplication done manually and done with the Deduplicator on the following outcomes: 1) time required to deduplicate; 2) numbers of duplicates missed 3) number of non-duplicates removed. Two screeners will independently deduplicate 10 sets of search results. The first screener will do sets 1 to 5 manually, then sets 6 to 10 with the Deduplicator. The second screener will do the opposite, e.g., sets 1 to 5 with the Deduplicator, then sets 6 to 10 manually. If these results are promising, the evaluation will be expanded to a stronger study design, include additional sets of search results and more participants.

Results

The Deduplicator has been tested internally, on a test set of search results from published SRs, 9835 references in total. This testing shows a combined accuracy of 99.04%, (9741 out of 9835 references correctly classified). There was also a substantial time saving, with time for duplicate removal being reduced from one hour to 10 minutes, when done by an experienced person.

Conclusion

Early testing shows the Deduplicator increases the speed of duplicate detection, with no loss of quality. More robust results will be presented at the research conference.

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PR21: Design and Justification of a learning plan aimed at final year medical students to ease the transition of medical school into internship.

Hogan, Kathleen 5th Year Medical Student, Health Sciences and Medicine, Bond University

Background

The transition from medical school to internship, the first year working as a junior doctor, can be extremely stressful and overwhelming. It is a significant jump in both clinical expectation and patient responsibility.

Many universities around the world have looked at ways to ease the transition, however, with the ongoing impacts of the COVID-19 pandemic students are extremely concerned about the uncertainty of their clinical training and are worried about being unprepared for the workplace (Scicluna et al., 2014; Lyons et al., 2020; Peluso et al., 2017).

This learning plan aimed to provide final year medical students with the appropriate skills, education and knowledge to achieve a successful transition from medical school to internship.

Method

The 2019 Australian Medical Council intern evaluation survey was used as a guide to determine what topics should be implemented into the learning plain. Specific learning theories, resources and strategies were also implemented into the learning plan to further enhance learner engagement.

Plan

The learning plan is comprised of six core topics: clinical education, procedural skills, documentation and administration, self-management, teamwork and organisation. Within each core topic are multiple education sessions for students to participate in, along with associated learning resources for students to utilise. Many of the education sessions provided are on topics where interns felt they could be better prepared. Evaluation of the learning is achieved through competency-based assessments and student feedback.

Conclusion

This learning plan may be implemented and amended to ensure it meets the current needs of future junior doctors.

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PR22: The effect of medical students' perceptions of preceptorship in the Emergency Department on quality of supervision and perceived confidence: A Descriptive Cross Sectional Study Protocol

Patel, Nikki, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Background

Quality clinical placements are imperative in affording medical students the opportunity to develop practical wisdom and foster confidence as a junior doctor. In midwifery and physiotherapy preceptorship programs exist whereby supervising clinicians oversee student learning; these have proved beneficial in reducing reality shock and easing the transition from student to professional role. The purpose of this study was to explore the effect of medical students' perceptions of preceptors on satisfaction of the Emergency Medicine rotation, and their perceived confidence for internship.

Methods

This study will be conducted using a descriptive cross-sectional design with a mixed methods approach. A cohort of 125 final year Bond medical students will be recruited via email, using both an electronic survey and semi structured interviews with willing participants following five weeks of their emergency medicine rotation. The study

will elicit information about their satisfaction of clinical supervision, preceptor qualities that were barriers and enablers to educational experiences, and the influence of preceptors on their self-confidence as a future intern. Qualitative data will be audio recorded, transcribed, and analysed using thematic analysis. Quantitative data from a standardised questionnaire will be analysed using Chi square test to establish relationships between preceptor characteristics (desirable and undesirable) and a) overall satisfaction of the clinical experiences and b) students' perceived confidence for internship.

Conclusion

Findings from this study will offer a unique insight into preceptor qualities that Bond medical students perceive as desirable, which will help inform the Medical Program about their students' needs while engaging in medical training and better preparing clinicians for their preceptor role.

PR23: Digital Education Resources for Dementia Caregivers in Australia: A Scoping Review

Chang, Victoria, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Jones, Cindy, Associate Professor of Behavioural Sciences, Health Sciences and Medicine, Bond University

Jones, Dominique, PhD Candidate, of Health Sciences and Medicine, Bond University

Background

With the rapidly increasing prevalence and burden of dementia, there is a demand for accessible and cost-effective training resources for carers.

Digital health educational resources can play an important role in addressing knowledge and training gaps for dementia carers.

Objective

This scoping review aimed to identify and evaluate available digital learning resources for formal and informal carers of dementia in Australia to (a) better inform its uptake; (b) identify gaps in dementia education that could potentially be delivered by digital educational methods; and (c) direct future research to investigate the gaps in the literature.

Method

This review adhered to the PRISMA-ScR method. Online databases were searched on four electronic databases - PubMed/Medline (Ovid), PsycINFO (Ovid), Embase

(Ovid), and CINAHL (EBSCO) - from 2016-2021. Literature was screened and selected according to the inclusion and exclusion criteria.

Results

A title of nine eligible studies were identified, published between 2018-2020. Digital learning was delivered via online courses or virtual simulation experiences. The majority of digital interventions were catered towards healthcare professionals, with only one program aimed at informal carers. All digital learning resources were effective in improving knowledge, awareness, confidence, and practice. Evaluations of the advantages and disadvantages of the digital learning resources were discussed.

Conclusions

This review found that digital health educational resources are effective in providing education and support to dementia carers. The major gaps identified were the need for more digital resources for informal carers, and the lack of higher quality studies or trials to ascertain the efficacy of these digital learning resources.

STREAM 5: DIGITAL MEDICAL EDUCATION

PR24: Foundations of Teaching: ESME online course and the development of a paediatric cardiovascular and respiratory resource for medical students

Ngo, Brenda, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Somasundaram, Vidhiyatharani, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Mclean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University

Introduction

In medical school, the curriculum is heavily focused on learning the necessary content and skills required to be a doctor. In addition to these core skills, training and experience in medical education is becoming increasingly important and more recognised. Therefore, to better prepare ourselves

as future medical educators, we participated in the "Foundations of Teaching" professional development project. This project helped us to learn essential teaching skills, understand the different types of learning styles and roles of a medical educator.

Method

We undertook the Essential Skills in Medical Education (ESME) course to develop an understanding of medical education and teaching principles to further appreciate the responsibilities of health care professionals as teachers. This included learning and applying one of the twelve roles of the teacher; our role as a resource developer; and understand the *Genially* online platform and utilise its components to create an infographic. As well as gaining a deeper understanding of the cardiovascular and respiratory system in paediatrics.

Project Outputs

Two primary tasks were completed: 1) The AMEE Student ESME Course. 2) An educational resource for medical students, on the topic of cardiovascular and respiratory paediatric conditions created using *Genially*.

Discussion

We have gained skills in academic writing, teamwork and time management as there were many deadlines and this was done alongside our regular placement schedules. A big part of this project has been reflection and acting on feedback. This MD project and report has enabled us to reflect on areas of difficulty and what we have gained from undertaking this project.

Conclusion

This professional project has allowed us to develop and better understand the responsibilities and essential skills that are needed as future medical educators. We were given the opportunity to apply these skills and improve our knowledge base in paediatric cardiology and respiratory conditions.

PR25: MD Professional Project- Essential Respiratory Cases

Gooch, Carl, 5th Year Medical Student, Health Sciences and Medicine, Bond University
McLean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University
Grant, Lucy, Assistant Professor, Health Sciences and Medicine, Bond University

Medical education is one of the key pillars of medicine and an area that requires more focus. The MD Professional Project allows a student to develop their own abilities in a particular area of interest in Medicine, such as education. The learning outcomes for this project were: (1) Begin to understand the basics of medical education and directly apply the skills and knowledge in order improve on my own educational style, to best promote learning in the future for my students, patients and peers. (2) Apply my skills as an educator plus the skills I have learnt, to develop an educational resource to improve the effectiveness of medical students' learning and educational experience.

Undertaking this Project allowed me to complete a 10-week course that included learning materials, discussion forums and assignments. The skills learnt and built upon throughout this course allowed me to create a resource for medical students heading into their clinical years.

Outcomes

The resource produced includes 15 respiratory cases that have in-depth answers as well as additional tips resources to stimulate further learning. Through completing the project tasks required, the learning outcomes were able to be met. Furthermore, I yielded great benefit in terms of my own personal and professional development. The project has greatly motivated me to promote education skills in my future career as an educator and to promote skills to other students.

PR26: 10 Gastroenterological cases for clinical students

Razkala, Mariam, 5th Year Medical Student, Health Sciences and Medicine, Bond University
McLean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University
Raikos Athanasios, Associate Professor Anatomy, Health Sciences and Medicine, Bond University.

Background

Clinical rotations often present difficulty for new students entering into a hospital workforce. In this new environment, sound clinical judgement and decision-making skills are essential to be able to make a successful contribution using a

multidisciplinary approach to patient care. Therefore, designing educational clinical scenarios and cases provide a useful resource to ensure better education and learning materials for medical students.

Method

Ten clinically different but crucial medical cases were made in reference to the sub-specialty of gastroenterology. A particular focus was made on the presentation, divergence of differential diagnoses as well as intricacies associated with clinical reasoning in medical practice.

Results

In total, there were ten separate cases created based on many common and encounterable presentations for gastroenterological cases. Each case was sought from updated databases for accuracy and currency of information. The results of the research into the conditions chosen allowed construction of specifically detailed cases including a presenting complaint, patient history taking, assessment as well as investigations and management. Each case was developed as a PowerPoint presentation with answers covered, so that student discussion and brainstorming of ideas could be undertaken prior to the case conclusion.

Conclusion

The use of clinical cases and discussion is essential for medical student education. These clinical contexts are important in developing and using better clinical judgment and rationalisation that can be achieved through case and study scenarios.

PR27: A scaffold for teaching a Psychiatry Rotation to Pre-Clinical Medical Students

Robertson, Matilda, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Introduction

As the final piece of assessment for Bond University's Master of Healthcare Innovation's subject, *Educating the Health Workforce for the 21st Century*, a learning plan was designed and justified on how to adequately deliver a psychiatry rotation to pre-clinical medical students. A well-delivered foundational Psychiatry Rotation is vital in ensuring a better clinical experience for students in future years, ultimately resulting in better healthcare user outcomes.

Design

Through assessing the learning needs of both the medical students and healthcare users, learning goals were established from both a student and organisational perspective. These learning goals underpinned the development of a six-week learning plan template which incorporated sessions such as panel discussions, lectures, problem-based learning cases, placements, podcasts, immersive workshops, and both formative and summative assessments. Various strategies were proposed in the learning plan to engage learners such as incorporating a minimum of one interactive session into the curriculum per week, employing a variety of educators offering varying perspectives to deliver educational content, and utilising multiple delivery platforms to deliver similar content to reinforce learning.

Justification

An assessment of learning needs was conducted through researching documented medical student's formal learning needs, and also conducting *real world research* to create a user-centred curriculum. Three principal learning theories underpinned the development of the learning plan and its included content: Knowle's theory of andragogy; Kolb's experiential learning theory; and Billet's workplace learning theory. Ultimately, these theories in conjunction with specific strategies used to engage learners, justified the development of the learning plan.

PR28: The development of an online musculoskeletal medicine tool for medical students

Chitti, Peter, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Alsaba, Nemat, Emergency Physician, Assistant Professor in Medical Education and Simulation Health Sciences and Medicine, Bond University

McLean, Michelle, Professor in Medical Education, Health Sciences and Medicine, Bond University

Introduction

Musculoskeletal disorders are one of the most common presentations in primary care and healthcare settings throughout the world. Despite this prevalence, medical education does not appear to provide sufficient exposure or training, with various studies concluding that medical students lack the confidence and skills necessary in proficient

examination and diagnosis of musculoskeletal conditions. The main goal of this MD Professional Project was to create a learning platform that would be able to deliver fit-for-purpose musculoskeletal medicine content to engage and inform medical students.

Method

Three online modules were created, using Microsoft Sway and Microsoft Forms. The modules are based on common musculoskeletal presentations of the shoulder, knee and ankle. Short video segments were recorded with a simulated patient and embedded into the online modules to demonstrate physical examination techniques. An Essential Skills in Medical Education (ESME) course, conducted by AMEE, was also completed to provide the theoretical foundations for the resource development.

Results

Project outputs included the three completed online musculoskeletal modules that will be available for medical students during their pre-clinical and clinical years, with the aim of expanding their musculoskeletal knowledge base and clinical reasoning skills. The ESME course was completed in April 2021.

Conclusion

The MD project resulted in an online learning platform that could be accessed by students anytime to improve their learning in relevant areas of musculoskeletal medicine. Additional musculoskeletal medicine modules could be created in the future, which would likely benefit the learning and prospective clinical practice of students.

PR29: Foundations of teaching: AMEE's Student ESME online course and development of an anaesthetic resource for clinical students.

Litzow, Samantha, 5th Year Medical Student, Health Sciences and Medicine, Bond University
McLean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University
Forrest, Kirsty, Dean of Medicine, Health Sciences and Medicine, Bond University

Introduction

Understanding medical education is relevant for all medical students as they will find themselves in the role of an educator throughout their career. This project provided me with an understanding of the theoretical underpinnings of medical education, the, foundational teaching skills to be acquired as well as application of this knowledge through the development of an education podcast.

Methods

Two major tasks were completed in the project: 1) the Essential Skills in Medical Education (ESME) Course, 2) the development of an educational resource.

Project Outputs

I produced a podcast series titled Going Under for medical students undertaking their anaesthetics rotation. I also successfully completed the ESME course. I gained theoretical knowledge which I applied using digital technology and audio recording.

Conclusion

Through this professional project I developed skills that go beyond this project and can be applied in my future role as a medical practitioner, both formally and informally. These skills developed and knowledge gained form an integral part of my future professional development.

PR30: Learning Plan Aimed at Final Year Medical Student with an Interest in Cardiology

Anderson, Sam, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Introduction

Cardiology is a complex specialty with a broad range of knowledge and technical skills required. The aim of this learning plan was to improve students' foundation knowledge in cardiology and outline the practicalities of managing a cardiac presentation in an Emergency Department.

Method

The learning program was a blend of online and face-to-face sessions in order to provide students with autonomy. The strategies used to engage the learners included voice-over PowerPoint presentations, formative written assessment, simulations, self-reflection logs and a professional mentoring program. The theoretical content focused on basic cardiovascular physiology, electrocardiogram interpretation and examination of common cardiac presentations.

Results

The goals for the learning plan were to improve foundational knowledge of cardiovascular physiology, increase self-confidence in clinical decision making and develop teamwork skills. Additionally, the students were encouraged to design their own goals for the program. It was vital for the learners to be intrinsically motivated and reflect on their progress throughout the program. In order to assess the students' development, simulations were used at spaced intervals to allow the learners to demonstrate the skills developed throughout the program.

Conclusion

Overall, cardiology is a complex and demanding specialty which takes time to grasp the concepts and clinical practicalities. The learning plan is a first step which could be developed in the future. The program may be beneficial in pre-clinical student cohorts by providing resources to extend their knowledge and understanding of cardiology in a clinical setting.

PR31: Cranial Nerve Anatomy Education in a Tertiary Setting: A scoping review

Yu, Zirong, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Raikos Athanasios, Associate Professor Anatomy, Health Sciences and Medicine, Bond University,

McLean Michelle, Associate Professor Medical Education, Health Sciences and Medicine, Bond University.

Background

University education has always evolved consistently with technology as well as formulas in order to better accommodate student needs and learning styles. Anatomy teaching in cranial nerves have always been an area of contention and difficulty among students, especially in a didactic teaching context. Several recent studies have pointed out different ways by which cranial nerves are now taught in universities.

Method

A scoping review of the literature from 2011-2021 was conducted to find information regarding how cranial nerves are taught in universities. PubMed, Embase as well as google scholar were the main databases used to source the literature.

Results

Twenty articles that point directly to how cranial nerves are taught in universities were identified and analysed. Major issues identified included: the use of 3D technology, as well as virtual reality, to better allow students to understand and comprehend cranial nerve anatomy. Most studies explained different ways by which cranial nerves are taught using individual techniques used in particular universities. Some studies also used feedback from student appraisals to showcase the effectiveness of newer interventions in tertiary education.

Conclusion

Overall, newer technologies have allowed for better and more enhanced teachings of cranial nerves. Considering the advancements of education there are guidelines to recommend contemporary general anatomy teachings, however the literature was found to still be lacking for specific teachings in cranial nerve guideline development.

STREAM 6: INTERNAL MEDICINE EMERGENCY MEDICINE

PB5: Title: Exploring predictors of arterial stiffness and left ventricular longitudinal strain in heart failure through recording of pulse wave velocity via digital pulse waveform analysis.

Sidhu, Amitouj, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Wahi, Siddhant, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Wood, Omar, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Howes, Laurie, Consultant Cardiologist, Gold Coast University Hospital

Hattingh, Laetitia, Clinical Researcher and Senior Pharmacist, Griffith University

Stirling, Allan, Associate Professor of Anatomy, Health Sciences and Medicine, Bond University

Background

Heart failure is a well-established cause of recurrent hospital admissions and cardiovascular-related deaths in Australia. Arterial stiffness is an emerging clinical tool that can assist clinicians in predicting morbidity and mortality in heart failure patients.

Although, the factors which directly impact arterial stiffness measurements are less clear.

Method

Patients from the Gold Coast University Hospital outpatient heart failure clinics were invited to participate in this study. Patients were consented and underwent multiple measurements of arterial stiffness using the Micromedical Pulse Trace Recorder. Data collected in this study focused on demographic details from patients, comorbidities, medications, biochemistry, and echocardiography results from online medical records. Data was first analysed using a machine-based learning decision tree, and specific variables underwent linear regression for stiffness index (SI), resistance index (RI), and pulse-to-pulse time (PPT).

Results

A total of 56 patients were recruited in this study for the final regression analysis. SI was not directly associated with haemoglobin, corrected calcium, potassium, statins, Type 2 diabetes mellitus (T2DM), age, uric acid, and diastolic blood pressure. We found haemoglobin and age to have a statistically significant relationship with RI. Potassium levels and age are both independent predictors for PPT in heart failure patients.

Conclusion

Arterial stiffness measured through pulse wave velocity serves as a portable and convenient method of determining vascular stiffness in heart failure patients. Our study found no significant correlation between our variables of interest and arterial stiffness in heart failure. Further patient recruitment is necessary in a long-term setting to further investigate the impact arterial stiffness has on other biochemical and haemodynamic variables in heart failure patients.

PR32: Exploring the relationship between psychological safety and relational coordination in simulation and the Emergency Department workplace

El-Bitar, Anthony, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Borchert, Laura, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Purdy, Eve, Emergency Medicine and Research Education Fellow, Gold Coast University Hospital

Brazil, Victoria, Professor Emergency Medicine, Bond University and Gold Coast University Hospital

Background

Psychological safety is a "belief that one will not be punished or humiliated for speaking up with ideas, questions, concerns or mistakes" (1). Relational coordination (RC) is a process that supports the coordination of interdependent tasks in a workplace (2). These are fundamental concepts for high functioning teams within a variety of contexts. There is limited understanding of the relationship between psychological safety and relational coordination in simulation and the emergency department (ED).

Method

This mixed-methods study included nurses and doctors at the Gold Coast University Hospital ED. Participants initially completed a survey and these findings directed semi-structured interviews. The qualitative data interpretation involved deductive theme analysis with the Psychological Safety and the RC frameworks.

Results

Seventy two of the 410 ED staff members completed the survey, and 19 interviews were conducted. There was a mean psychological safety score of 35.5/49 (SD=7.4) with heightened psychological safety associated with role and duration of working in ED. The qualitative analysis showed the prominent factor influencing psychological safety for participants was familiarity with team members. RC manifested in the ED setting and in simulation-based training across all elements of the framework.

Conclusion

Simulation was found to help to forge relationships and increase familiarity with team members which enhanced psychological safety. RC occurred in both simulation and the ED workplace, and the elements of RC appear to foster relationships amongst ED staff and promote closed-loop communication. The study findings can be used by EDs aiming to increase understanding of psychological safety and relational coordination to enhance team performance.

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PR33: Leflunomide for Polymyalgia Rheumatica + Giant Cell Arteritis: A Systematic Review Protocol

Pulling, Grace, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Rationale: For the Master of Healthcare Innovations' Systematic Review subject, we were required to design a systematic review protocol for an intervention in a relatively unexplored area.

Background

Polymyalgia rheumatica (PMR) and giant cell arteritis (GCA) are associated rheumatic inflammatory conditions that affect adults over 50 years of age.[1,2] Glucocorticoid treatment with a tapering regimen and methotrexate comprise the mainstay of treatment in both conditions.[1,3] Despite current management of PMR and GCA, many patients continue to experience flares. The effects of which can be dire e.g., GCA – blindness, stroke.[1,2] With high-dose and protracted steroid regimens, patients are subject to glucocorticoid toxicity. There is a need for more efficacious and steroid-sparing adjuvant therapies. Leflunomide is one of the newer DMARDs licenced for use in psoriatic and rheumatoid arthritis and has shown great benefit; there is potential for its use in GCA/PMR. The systematic review will aim to investigate the following question: *in the management of adults with PMR rheumatica AND/OR GCA, does oral leflunomide therapy improve disease control and steroid dose-tapering ability when compared to glucocorticoids and methotrexate?*

Method

This systematic review protocol defines the methods regarding eligibility criteria for study inclusion, sources of information, search strategy, process of collecting and recording data, data items, outcomes and prioritisation, risk of bias assessment, data synthesis, confidence in the evidence and a summary of findings.

Outcome

The protocol blueprints a robust systematic review design that limits bias and provides an accurate summary of existing evidence.

References

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PR34: Tranexamic Acid for Angiotensin-Converting Enzyme-Induced Angioedema: Protocol for a Systematic Review and Meta-Analysis

Erzetic, Madeleine, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Rationale

This systematic review protocol was developed as part of the Systematic Review subject in the Master of Healthcare Innovations program.

Background

Angiotensin-converting enzyme inhibitor-induced angioedema (ACEI-IA) is a rare but potentially life-threatening adverse effect of ACEIs, a drug class prescribed to approximately 40 million people worldwide. At present, there is no approved therapy for the management of ACE-IA. Recent studies have proposed tranexamic acid (TXA) as an effective treatment for this clinical syndrome. This systematic review aims to collect, analyse and summarise the available evidence on the efficacy of using TXA for the treatment of ACEI-IA.

Methods

A systematic review of randomised controlled trials will be conducted. CENTRAL, MEDLINE, EMBASE, CINAHL, the WHO Clinical Trial Registry Platform, ClinicalTrials.gov and other grey literature will be searched from 2010 to 2021 using a comprehensive search strategy. Studies will be included if they report complete resolution of angioedema, symptom severity, duration of episode, requirement for airway intervention, or adverse events. Study selection will be conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. The methodological quality of studies will be assessed using the Cochrane risk-of-bias tool 2 and the Grading of Recommendations, Assessment, Development and Evaluation approach. If data is sufficiently similar, a meta-analysis will be conducted using a random effects model. Prior to pooling results, statistical heterogeneity will be examined using the Chi^2 test and the I^2 statistic. If required, subgroup analysis, sensitivity analysis and an assessment of meta-biases will be conducted.

References

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PR35: The role of tourniquets in reducing the rates of crush syndrome: a protocol for a systematic review

Kamali, Mohammed, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Background

The use of tourniquets has a theoretical benefit in reducing and delaying the onset of crush syndrome. However, data on its clinical use especially in cases of disasters and warfare are yet to be critically evaluated. Traumatic crush injuries will result in rhabdomyolysis in approximately 80% of cases.[1] Whilst the use of tourniquets has been established in emergency medicine as a method to prevent ongoing blood loss during the extrication process, it is also imperative to study the added potential of the reduction of crush syndrome in those individuals. We aim to provide quality evidence for the hypothesis that the use of tourniquets in a crush injury will provide benefit to the victim by reducing the risk of developing crush syndrome.

Method

A systematic review of randomised controlled trials on the role of tourniquets in relation to crush syndrome will be conducted. Embase, PubMed and CENTRAL will be utilised to search for all applicable studies before the 1st of May 2022. PROSPERO will be used to identify any planned systematic reviews. Cochrane Risk-of-Bias Tool will be used for the appraisal of the studies. If large amounts of homogeneity are present in the studies, a meta-analysis using a random effects model will be implemented. We will be using the Chi^2 test and the I^2 statistic to evaluate heterogeneity. If heterogeneity is substantial, a narrative qualitative summary will be pursued.

Conclusion

This information will be used by emergency personal to develop key strategies when managing a trapped individual.

References:

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PR36: The use of metaraminol in treating refractory hypotension in anaphylaxis – a systematic review protocol

Unuth, Mrinal, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Introduction

Anaphylaxis is a rapid onset, multisystem hypersensitivity reaction that is potentially life-threatening and must always be treated as a medical emergency. Adrenaline remains the cornerstone management for anaphylaxis. However, some patients fail to respond to it and remain hypotensive. There have been cases where intravenous administration of metaraminol can be potentially lifesaving. The aim of this systematic review is to collate the evidence available on metaraminol for treating refractory hypotension in anaphylactic patients and evaluate its efficacy and safety.

Methods

A systematic review of randomised controlled trials (RCTs) will be conducted on the use of adjunct vasopressors for the management of refractory anaphylaxis. Embase, MEDLINE, CENTRAL and Web of Science databases will be searched with no restriction on the year of publication. Patients of any age with confirmed anaphylaxis who have not responded to first-line treatment will be included. The primary outcome will be the effect on the patient's mean arterial pressure. Study selection will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Study quality will be assessed using Cochrane Risk-of Bias Tool for RCTs. A quantitative analysis will be conducted for all included studies. If sufficient data are available, a meta-analysis will be conducted. I^2 will be used to assess heterogeneity and identify their potential sources.

Conclusion

The importance of doing this systematic review is to ultimately guide health practitioners when faced with the task of treating hypotension in anaphylactic patients with poor response to first line management.

PR37: The Foundations of Teaching

Ishak, Sarah, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Mclean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University

Forbes, Melanie, Assistant Professor, Health Sciences and Medicine, Bond University

Introduction

The purpose of this MD project was to create an educational resource using evidence-based teaching methods that addressed an aspect of the medical curriculum students have often had difficulty with. This report details my motivations behind creating a resource on medical education, my engagement with the Student Essential Skills in Medical Education (ESME) course, the process of developing my resource, the knowledge gained from this experience and its impact on my future role as a clinician and teacher.

Methods

This project involved first completing the ESME Student Course. This was done to learn and understand the application of proficient teaching methods and techniques to optimise student education. Research was then conducted to discover a proficient software to transmit/present online teaching in an interactive and effective method. The topic of student difficulty was identified as the assessment of an acutely presenting patient in an emergency setting. Consequently, personal research was conducted on the topic of primary and secondary surveys using the modalities.

Results

The products of this professional project were the completion of the ESME Student Course and the development of an online interactive resource for third year medical students on Primary and Secondary Surveys.

PR38: Development and evaluation of an insulin prescribing decision support tool for adult patients

Mugunthan, Sivarubini, 5th Year Medical Student, Health Sciences and Medicine, Bond University.

Hattingh, Laetitia, Clinical Researcher, Pharmacist, Gold Coast University Hospital.

Griffin, Katherine, Specialist in Endocrinology and General Medicine, Gold Coast University Hospital.

Introduction

Prescribing is a complex task and a high-risk area in clinical practice. As more individuals with diabetes are being hospitalised, prescribing insulin safely is an important skill that require doctor competence. Since the introduction of the integrated electronic medical records (ieMR) in Gold Coast Health, a new layer of complexity has been added. Therefore, the

aim of this project was to identify the key issues with insulin prescription using ieMR, develop a decision support tool addressing these issues and evaluate the effectiveness of the resource.

Method

Mixed methodology was used for this study, which was conducted from August 2020 to July 2021. Phase 1 involved qualitative data collection via stakeholder interviews which directed Phase 2, the creation of the decision support tool. The final phase was trialling the effectiveness of the tool via pre and post-test questionnaire (quantitative) to determine any change in their knowledge, confidence, and competence.

Results

The semi-structured interviews with ten stakeholders identified the pertinent issues with insulin prescription using ieMR. Based on these findings, a decision support tool was formulated as it was more user-friendly and complemented the current resources. The pre- and post-questionnaires used to evaluate the tool demonstrated an improvement in eight prescribers' confidence in accessing the existing resources as well as navigating and prescribing insulin using ieMR. Certain components of the questionnaire showed statistically significant changes.

Conclusion

This tool should be considered as a useful addition to the ieMR resources to improve insulin prescribing.

STREAM 7: MENTAL HEALTH STIGMA

PB6: Impact of mental health stigma and program to support doctors and medical students: A scoping review

Sharma, Andrea, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Ahmed, Fariha, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Griffiths, Marisa, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Jones, Cindy, Associate Professor of Behavioural Sciences, Health Sciences and Medicine, Bond University

Jones, Dominique, PhD Candidate, Faculty of Health Sciences and Medicine, Bond University

Background

Mental illnesses such as depression, anxiety, burnout, and suicidal ideation are more common among doctors and medical students than their age-related peers. Despite this, doctors and medical students are less likely to seek professional help, a phenomenon that may be attributed to self-stigma and fear of stigmatisation from peers. This review aims to provide an overview of the current evidence regarding the impact of mental health stigma on doctors and medical students, and interventions or programs that have been evaluated to reduce this stigma.

Method

A scoping review was conducted through searching electronic databases (PubMed, EMBASE, CINAHL, PsycInfo), reference lists of relevant articles, and the grey literature. Articles were selected according to the inclusion and exclusion criteria. A data extraction table was developed that summarised study characteristics, results, and quality outcomes using the Mixed Methods Appraisal Tool.

Results

From 2896 unique records, five primary studies were eligible for inclusion in the review. Three intervention categories were described: a peer support program (n=1), student led curriculum (n=2) and sharing of personal experiences by physicians or fellow medical students (n=3). Study designs included qualitative, quantitative and mixed method approaches. All papers reported positive outcomes in attitudes and stigma reduction. Methodological quality varied significantly.

Conclusion

This scoping review highlights the dearth of research in this area, particularly for doctors. Based on the findings, medical schools may consider implementing such programmes to reduce mental health stigma, and further research into the efficacy of different interventions for both medical students and doctors is recommended.

PR39: Pharmacotherapy and electroconvulsive therapy profile for women with depression, anxiety, schizophrenia, or bipolar affective disorder in a psychiatric mother-baby unit

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Introduction

In the postpartum, pharmacotherapy and electroconvulsive therapy (ECT) are considered key interventions for the treatment of psychiatric disorders. The aims of this study were: to examine the prescribing practices of women with psychiatric illnesses in a mother-baby unit (MBU), and to assess alignment with the national prescribing guidelines.

Methods

A retrospective audit of women with mental illness admitted to a psychiatric MBU was conducted. Pharmacotherapy treatment at three time points: commencement of admission (T1), mid-way through admission (T2), and at discharge (T3) was extracted. Descriptive statistics were completed.

Results

Most women with depression (n=57, 73%) were prescribed Selective Serotonin Reuptake Inhibitors (SSRIs), and 39% of them were breastfeeding. ECT was provided to 14% of women with depression, following a trial of antidepressants. For women with anxiety (n=17), 23% were prescribed a benzodiazepine in the short-term. Women with schizophrenia (n=53, 96.55%) mostly received atypical antipsychotics. Five women (20.83%) with bipolar affective disorder of childbearing age were prescribed sodium valproate, with four given contraception. Mood stabilisers were prescribed to four women (66.67%) while breastfeeding with infant monitoring. Most women (91.67%) prescribed lithium were not breastfeeding.

Conclusion

This is the first naturalistic study to examine the therapeutic armamentarium employed for the treatment of mothers admitted to a psychiatric MBU. This study highlights that the prescribing patterns across three time points during admission were in alignment with national guidelines, reinforcing the management provided at MBUs. This study also emphasizes more specific psychiatric prescribing guidelines are required for the postnatal period.

References

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PR40: Designing learning for a specific health workforce group: a plan to educate medical students on domestic violence

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Background

A learning plan around domestic violence in Australia has been designed for medical students in Australia as part of an assignment for the subject 'Educating the Health Workforce' at Bond University. Domestic violence results in physical and psychological harm that contributes to numerous acute and chronic health conditions (Australian Institute of Health and Welfare, 2018). Despite the prevalence of domestic violence and its impact on health outcomes there is limited education on the topic within Australian medical school's curriculums (Valpied, et al., 2017*)*.

Proposed learning plan

The learning plan proposed was designed to address this gap in the curriculum. The proposed learning plan spans four weeks incorporating a variety of mediums to deliver the educational material. The four-week plan is intended to be integrated into the medical school curriculum of clinical year students. The proposed assessment to gather evidence of learning was a reflection task. The reflection task was integrated to encourage and support the use of the reflective practice within the medical workforce whilst enabling the students to demonstrate their learning. This assignment provided insights into the challenges of providing sufficient timeframes, multi-modal content and the necessary resources when trying to design an education plan that remains feasible, engaging and effective.

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PR41: Foundations of teaching, developing skills in one or more of the 12 teacher roles: the AMEE-ESME online course and a psychiatry-focused educational resource for medical students and junior doctors

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Introduction

I undertook my MD Professional Project based on the foundations of learning and teaching with an aim of developing my skills in one or more of the 12 teacher roles.[1] This goal was achieved through the completion of an online student course aimed at improving best practice in medical education and through the production of a psychiatry-focused educational resource for medical students.

Method

I undertook the AMEE-Essential Skills in Medical Education (ESME) online student course, which involved the completion of five learning modules, assignments and participation in online discussion forums. Production of my educational resource involved submitting an MD project plan, researching psychiatric presentations, sourcing suitable candidates, drafting episode plans, attaining signed consent forms, and recording and editing each episode.

Project outputs

I completed the ESME course in April 2021. I then produced an educational resource that comprised a series of four interview-format podcast episodes, each exploring a different mental health condition.

Discussion and conclusion

This report draws on educational theory including learning outcomes of the Scottish Doctor, the SPICES model,[2] FAIR principles[3] and the 12 roles of the teacher.[1] My primary objective of developing skills in one or more of the 12 teacher roles,[1] was directly met through my project outputs wherein I assumed the roles of 'lecturer' and 'resource developer'.[1] This project has expanded my understanding of how educational theories and approaches can contribute to the advancement of knowledge and the skills I have developed will be transferrable across my career.

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PR42: A psychosocial profile of women admitted to a mother and baby unit with postpartum depression

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Purpose

This study investigated the prevalence of demographic, social, psychiatric, obstetric, and infant-related risk factors for postpartum depression in a cohort of women admitted to a mother and baby unit.

Method

Variables were sourced from the Marcé Clinical Checklist, Postnatal Risk Questionnaire, Adverse

Childhood Experiences Index, and a literature review. A retrospective chart audit design was employed.

Results

In our cohort of 74 women diagnosed with postpartum depression, prevalent risk factors included a history of trauma and/or abuse (58.11%), adverse childhood experiences (81.08%), personal history of mental illness (83.78%), and antenatal psychiatric symptoms (56.76%). A number of other risk factors which have been reported as significant in the literature were not as prevalent in this cohort, including low socioeconomic status, low social supports (17.57%), and intimate partner violence (18.9%).

Conclusions

The most reliable predictor of postpartum depression, as has been reported in the literature, is a previous history of depression or antenatal depressive symptoms. Women admitted to this unit were diverse in their psychosocial profile, however many shared a history of adverse childhood experiences and trauma or abuse, indicating that this may be an important topic for future research.

PR43: A scoping literature review on the best forensic mental health community model of care.

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Aims

Progress in forensic psychiatry over the last 20 years, including reduced institutionalisation of forensic patients, has led to increased demand for and adaptation of forensic community mental health care delivery systems for this high risk, complex psychiatric population. This project aims to compare a newly established forensic community team, the "Risk Reduction by Engaging in Assertive Community Healthcare" (REACH) team, Gold Coast Mental Health Service, against domestic and international forensic community mental health practices.

Method

A scoping literature review was undertaken to gain an overall understanding of the current available evidence related to forensic community mental health service models.

Results

Clinical heterogeneity within the forensic population made comparison of models of care challenging. Three central elements to the design and function of the models of care were identified: service structure, providers, and therapeutic interventions. Assertive care with additional forensic measures proved superior to traditional models. Regardless of team model, clinician continuity of care was the core contributor to improved outcomes. Literature investigating therapeutic interventions is lacking; outcome measures focus mostly on reduction of recidivism and hospital admission. A number of randomised control trials are in progress to evaluate alternative treatments and outcome measures.

Conclusion

A one-size-fits-all overall best practice model was not identified. However, the research identified components of successful models which could be integrated. The feasibility of integration is dependent on staff/financial resources and patient demographics. Further research regarding therapeutic interventions is needed relative to both quantitative and qualitative outcome measures. A service evaluation of REACH's practices may add depth to the already published research.

PR44: Personality disorders and psychotic disorders in mothers admitted to a mother-baby unit: traumatic, psychiatric and admission factors

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Introduction

Personality and psychotic disorders in the perinatal period are classified as serious mental health disorders and require immediate diagnosis and appropriate intervention. Current evidence on these disorders and associated factors are scarce. This study compares a range of traumatic, psychiatric and admission factors associated with mothers with personality disorders and mothers with psychotic disorders admitted to a mother-baby unit.

Method

Data on three domains were collected using medical records: 1) traumatic (adverse childhood events, emotional/physical abuse, intimate partner abuse); 2. psychiatric (family history of mental illness, pre-existing psychiatric illness, history of past-partum illness, previous suicide attempts); 3) admission (involuntary admission and discharge, length of stay). Chi-square analysis and two-sample *t*-test was carried out to compare the difference between the two diagnoses for factors in each of the three domains.

Results

A statistically higher proportion of women with personality disorders experienced adverse childhood events ($p<0.01$), had a history emotional/physical abuse ($p<0.05$), had pre-existing psychiatric illnesses ($p<0.01$), and had previous suicide attempts ($p<0.05$). A statistically higher proportion of women personality disorders reported having one or more trauma factors ($p<0.01$) and one or more psychiatric factors ($p<0.05$). Women with psychotic disorders had a longer length of stay ($p<0.05$), and a higher proportion of these women had been admitted involuntarily ($p<0.001$) compared to those with personality disorders.

Conclusion

Our findings highlight the importance of routine mental health screening and appropriate interventions in the perinatal period to ensure the safety of mothers and their babies. Early detection can help identify and address potential long-term implications on mother-baby dyad.

PR45: Microaggressions and micro-inequities in medicine

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Schuch, Blair. 4th year medical student, Griffith University, Health Sciences and Medicine.

Introduction

This study aims to describe microaggressions faced by junior doctors in the Gold Coast Health Service (GCHS) and their impact on engagement with their chosen careers. Recent research on this subject largely focuses on the domains of gender and sexuality and highlights their detrimental effects – both personal and professional. This study explores the intersectionality of gender, sexuality, race, and disability, thus, is an important addition in this research field.

Methods

This qualitative study was conducted with semi structured focus groups involving PGY1-5 doctors working at GCHS. 14 participants across medical and surgical specialties were included. Research questions explored types of microaggressions encountered, their impacts and the recipient's response.

Results

The data revealed consistent examples of microaggressions across all 4 domains. The six major themes were 'awareness is present however there is uncertainty on response'; 'response depends on consequences and is guided by minimising additional work'; 'both perpetrators and recipients normalise microaggressions'; 'structures such as complaint systems are designed to appear like actions, but act in ways that make it harder to respond appropriately'; 'macroaggressions are prevalent and unresolved, leading to confusion regarding microaggressions'; and a façade of equality masks existing inequity.

Conclusion

Junior doctors are not empowered to report microaggressions and reporting structures fail to recognise microaggressions. Currently, no strategies or efficacious reporting structures exist to facilitate resolution of microaggression at this health service. Alarmingly maladaptive, emotional responses and normalisation of microaggressions was evident, and peer-to-peer debriefing was adopted as a primitive, ad hoc approach instead of formal reporting.

STREAM 8: BIOMED DIETETICS HUMAN MOVEMENT

LP3: Selective PARP14 inhibition of novel *N*-substituted carbazole carboxylic acid derivatives

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Introduction

Due to the highly conserved catalytic domain within the PARP enzymes, new PARP14 inhibitor designs look to target domains outside of this region.[1] Macrodomains 2 and 3 (MD2/MD3) are an ideal target for selective inhibition as they are responsible for the recruitment of PARP14 to ADP ribosylated sites.[2] Consequently, inhibition of these macrodomains should result in limited (ADP-ribosyl)ation, significantly decreasing PARP14 activity.[2] Therefore, as selective PARP14 inhibitors centre on the simultaneous inhibition of MD2/MD3 this study sought to design a dual MD2/MD3 inhibitor.

Method

20 *N*-substituted carbazole carboxylic acid derivatives were computationally docked into MD2 (3Q71.pdb) and MD3 (4ABK.pdb) using Autodock Vina in PyRx to measure their binding affinities. Three *N*-substituted carbazole carboxylic acid derivatives (compounds 1-3) were synthesised through alkylating carbazole with 1,4 dibromobutane producing 9-(3-Bromopropyl)-9H-carbazole with 68% yield.[3] Next, the bromide carbazole was reacted with varying aminobenzoic acids producing three N-substituted carbazole aminobenzoic acids with 30-50% yields.

Results

Visualisation of the docked pose using UCSF Chimera revealed that the inhibitors in MD3 mimicked ADPr where they bound in the conserved L-shaped cleft. Compound-10 bearing a *meta* methyl and an *ortho* chlorine on the aminobenzene ring produced a binding affinity of -10.3kcal/mol stronger than the ligand ADPr at -10kcal/mol. The higher binding affinity could be attributed to the inhibitor hydrogen bonding to GLY1332 allowing it to fit tighter into the hydrophobic binding pocket. Whereas, in MD2 the inhibitors acted as allosteric effectors binding outside of the hydrophobic pocket. Compound-5 containing an *ortho* chlorine allowed it to hydrogen bond to GLN 996 producing the highest binding affinity in MD2 (-9.4kcal/mol).

Conclusion

Overall, we have developed novel dual MD2/MD3 PARP14 inhibitors that are now under further investigation through *in vitro* studies. This work provides a scaffold for future PARP14 inhibitors with the overall goal of creating a treatment option for many cancers.

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LP4: The relationship between underwater dolphin kick performance determinants and underwater kick velocity in competitive swimmers: a systematic review

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Introduction

The underwater dolphin kick (UWK) has become an integral component of the start and turn phases in competitive swimming and can account for up to

30% of race distance. At depths 0.4 and below the water surface, hydrodynamic resistances are 2.4 times smaller than that at the surface, making the undulatory movement one of the fastest forms of human aquatic locomotion. Performance determinants of the UWK can be broadly categorised as ways to minimise resistance drag and/ or to improve propulsive force production. An understanding of the most important determinants for UWK performance and how these can be optimised to different swimmers' characteristics is poorly understood.

Method

An electronic search using AusSportMed, Embase, PubMed and SPORTDiscus was performed. The methodological quality of the studies was evaluated using a biomechanics-specific checklist developed by Hindle et al. (2019).

Results

Twenty-two studies met the eligibility criteria. While UWK velocity was nearly perfectly related (r>0.90) to foot resultant acceleration and kick frequency, several other biomechanical factors were also significant correlates. UWK kick velocity and frequency were typically higher in swimmers who have at least performed to a national standard and during prone versus dorsal positions. UWK velocity, kick frequency and kick amplitude were also significantly correlated to high angular velocities of the hip, knee and ankle joints, as well as knee range of motion.

Conclusion

While there appears to be evidence supporting some performance variables to be related to UWK, future research should examine how to optimise the kinematic and kinetic characteristics with respect to the imposed task and organism constraints between swimmers. Additional research should also investigate the effect of biomechanically informed interventions to improve UWK performance.

OP8: OCT-A window into the eye of retinal disease

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Background

Age-related macular degeneration (AMD) is one of the most common causes of irreversible blindness in the aging population. It is characterized into two forms, "wet"-AMD and "dry"-AMD, dependent on the presence or absence of leaking blood vessels, respectively. Pathology includes the degeneration of retinal pigment epithelium, light sensitive photoreceptors and the Bruch's Membrane. The use of optical coherence tomography (OCT) has become a valuable tool in monitoring retinal changes including such eye diseases as AMD. The objective of this study was to use OCT to monitor and quantify retinal-specific changes in a model of "wet"-AMD.

Method

For this study, a laser-treated rat model of "wet"-AMD, described as choroidal neovascularisation (CNV) was used. OCT was used to capture *in vivo* cross-sections of CNV laser-sites to monitor retinal layer changes over a period of one month. Images were analysed with the use of retinal layer segmentation. Images were also subjected to a reflective map to identify areas of hypo- and hyper-reflectiveness. Hematoxylin and eosin staining of retinal sections was used to confirm morphological changes.

Results

Critical analysis of OCT images showed changes to retinal layer thickness. Observed changes were localised to the laser-lesion site compared to control. Changes to hyper-reflectiveness from OCT images were observed within the same laser-lesion compared to control over-time. Disruption of retinal layers was evident in OCT and corresponded to morphological changes.

Conclusion

Over the past decade OCT has become increasingly popular for imaging human retina in monitoring eye disease, such as AMD. Changes in the reflectivity of individual retinal layers were observed over time and correlated well with confirmed morphologic changes. Quantitative analysis of OCT images

identified stages of CNV development that correspond to retinal layer degeneration, associated with changes observed in AMD. Results from this OCT imaging study can be used to understand and quantify the longitudinal degenerative stages associated with retinal disease.

LP5: The association between dietary patterns and novel inflammatory markers platelet activating factor and lipoprotein-associated phospholipase A2: a systematic review

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Atherosclerosis is a disease of chronic inflammation. Recent research has identified two novel inflammatory biomarkers, platelet activating factor (PAF) and lipoprotein-associated phospholipase A2 (Lp-PLA2). Diet has been proposed as a mediator of inflammation but to date, the focus has been on individual foods and nutrients rather than overall dietary patterns.

Objective

To systematically review the literature on the association between dietary patterns and PAF and Lp-PLA2.

Data Sources

PubMed, Embase, CINAHL and Cochrane CENTRAL were searched.

Data Analysis

Study quality was evaluated utilising the Quality Criteria Checklist. Sixteen studies (4 observational and 12 intervention) were included and assessed for associations between dietary patterns and PAF and Lp-PLA2.

Conclusion

Study quality varied from neutral (n=10) to positive (n=6). Mediterranean, heart healthy, and vegetarian dietary patterns were associated with improved levels of PAF and Lp-PLA2. Conversely Western dietary patterns were less favourable. A range of well-established healthier dietary patterns may lower inflammation and the risk of atherosclerosis. Further well-designed studies are needed to confirm these findings and identify other dietary patterns that improve inflammation.

OP5: The contribution of haematopoiesis in the spleen to myeloid-biased HSC development

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Background

Hematopoietic stem cells (HSC) can produce all blood cell types in the body. Amongst immune cells, this includes lymphoid-lineage T cells and B cells, and myeloid-lineage neutrophils and monocytes. Blood disorders can be characterised by the overproduction of myeloid cell lineages, and this can be attributed to a shift in "myeloid-biased" HSCs in the bone marrow, identified through high expression of the marker CD150. The development of myeloid-biased CD150^{hi} HSC can be attributed to multiple factors either intrinsic to the stem cell (Beerman et al., 2010) or controlled by extrinsic bone marrow microenvironmental signals (Vas, Senger, Dörr, Niebel, and Geiger, 2012). In addition to bone marrow, the spleen can act as an extramedullary HSC niche. Here, it is assumed that the splenic microenvironment specifically drives myelopoiesis from HSC localised in the tissue (Tan and O'Neill, 2012). We therefore hypothesise an additional mechanism for the generation of myeloid-biased HSC, where circulating HSC transiting through the spleen gain a myeloid-biased identity before accumulating in the bone marrow. To test this hypothesis, we are using an animal model for pregnancy, where elevated levels of estrogen stimulate heightened myelopoiesis and increased numbers of HSC entering spleen. Using this model, we will address whether circulation of HSC through the spleen following multiple rounds of pregnancy drive an increase in myeloid-biased CD150^{hi} HSC.

Method

Adult C57BL/6 female mice underwent six cycles of pregnancy and were sacrificed at 11 months of age (n = 10). To compare the effect of spleen on myelopoiesis, we analysed HSC from normal female exbreeders, splenectomised female exbreeders and age-matched female controls. HSC were isolated from bone marrow and $CD150^{hi}$ expression was analysed using flow cytometry.

Results

Median fluorescence intensity (MFI) of gated $CD150^{hi}$ HSC was compared between the three experimental groups. No significant differences in MFI were observed.

Conclusion

These data suggest the circulation of HSCs through spleen following multiple rounds of pregnancy may not have a role in the development of myeloid-biased $CD150^{hi}$ HSC.

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OP6: Potentiating effect of tadalafil on vasodilation of the porcine superior vesical artery

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Introduction

Impairment in blood flow to the bladder may play a role in the aetiology of bladder dysfunction. Recent evidence suggests that phosphodiesterase (PDE) 5 inhibitors may have beneficial effects in relieving impairment and improving symptoms, via vasodilation of the bladder vasculature. The aim of this study was to determine whether the clinically used phosphodiesterase-5 inhibitors tadalafil and sildenafil can potentiate nitric oxide-mediated vasodilation of the porcine superior vesical artery model.

Method

Porcine superior vesical arteries were obtained from a local abattoir. Circular sections, with endothelium intact, were mounted in organ baths containing oxygenated physiological solution (37˚C). Artery rings were vasoconstricted using noradrenaline, in the absence and presence of nitric oxide (NO) synthase inhibitor L-NNA. Vasodilation responses to endogenous endothelium-dependent (muscarinic-receptor agonist carbachol) and exogenous endothelium-independent NO release (SNAP, SIN-1 and sodium nitroprusside) were also obtained, in the absence and presence of PDE inhibitors tadalafil, sildenafil and papaverine. Statistical differences were determined using two-tailed paired Student's t-tests, with $P<0.05$ considered significant.

Results

Vasoconstriction responses of the superior vesical artery via noradrenaline were significantly ($P<0.05$, $n=6$) enhanced, by 45%, in the presence of NO-synthase inhibitor L-NNA, without change to potency of noradrenaline. All PDE inhibitors, papaverine, tadalafil and sildenafil, significantly ($P<0.001$, $P<0.01$ and $P<0.01$) depressed noradrenaline evoked vasoconstriction (58%, 26% and 35%). The potency of NO donors sodium nitroprusside, SIN-1 and SNAP in evoking vasodilation was significantly ($P<0.05$) potentiated by all inhibitors, with no change to maximal response.

Conclusion

Endothelium-independent vasodilation of the porcine superior vesical artery is potentiated by the clinically used phosphodiesterase-5 inhibitors tadalafil and sildenafil. This suggests that the isoenzyme phosphodiesterase-5 is present in this tissue, and that tadalafil and sildenafil acts on endothelium-independent NO-mediated

vasodilatory pathways which may contribute to their beneficial effects in improving bladder symptoms.

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LP6: Fingertip blood samples present innovative way to assess lymphocyte diurnal variation.

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Introduction

There has been increasing interest surrounding the 'biological clock's' influence on immunological responses. The 2017 Physiology Nobel Prize was awarded to the team that discovered mechanisms regulating circadian rhythms. Currently the effect of diurnal variation on circulating lymphocytes is largely unknown. Previous studies utilised venous blood with varying results (1-3). This study sought to determine whether fingertip blood volumes are viable compared to larger venous volumes with the aim that this modified technique would be used to determine the effect of diurnal variation on circulating lymphocytes using flow cytometry.

Method

Blood was collected from a female participant and processed with a BD Biosciences IMK Lymphocyte Simultest Kit, containing reagents identifying B-cells, T-cells, helper T-cells, cytotoxic T-cells, and natural killer (NK) cells using either the recommended 100µL of blood and 20µL of reagent, or 25µL of blood and 5µL of reagent.

Results

Lymphocyte counts analysed using a FACSVerse flow cytometer were consistent with both methodologies. T-cells accounted for 62.1% of the 100µL sample and 60.9% of the 25µL sample, while B-cells accounted for 8.59% and 10.6% and NK cells were 9.26% and 6.61% respectively. T-cell subset analysis demonstrated identical helper T-cell counts (35.1%) and cytotoxic T-cells of 29.7% and 23.8% for 100µL and 25µL respectively. All values are within the 95% reference range provided by the manufacturer's manual.

Conclusion

This study demonstrates that lower blood volumes are suitable for lymphocytic assessments using flow cytometry providing validation for methodologies using small fingerprick blood collections. When assessing diurnal variation, as multiple blood collections are required, this revised protocol provides a more reasonable request for participants, compared to the more onerous requirement of venepuncture. Preliminary data is being gathered using this method, analysing the effect of diurnal variation on lymphocytes with the data potentially impacting vaccinations, immunological blood studies and autoimmune disease treatment.

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LP7: The effects of dimethyl sulfoxide on bladder contractile responses and nerve activity in the bladder

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Introduction

Local bladder treatments of 50% dimethyl sulfoxide (DMSO) are instilled in the bladder to treat symptoms of interstitial cystitis/ painful bladder syndrome (IC/PBS) (1). Although many patients report improvements after treatment, initially, many experience a flare up of symptoms (2). The mechanism of action of DMSO remain poorly understood and as such, the aim of this study is to analyse the effects of DMSO on bladder contractility and afferent nerves.

Method

Bladders from 13-week-old C57BL/6 male mice were isolated and catheterised to allow for bladder filling with 50% DMSO for 15 minutes, mimicking clinical conditions. Contractile response to purinergic receptor agonist, α,β methylene ATP (ABMA) (10uM), and muscarinic receptor agonist, carbachol (1uM) were measured. Activity in pelvic nerve afferents during distension was also measured.

Results

Preliminary results (n=1) indicate that the volume required to reach a pressure of 35mmHg had increased from 139uL to 158uL one hour after DMSO instillation. After three hours, the volume capacity decreased to 114uL. Following the application of DMSO, both ABMA and carbachol contractile responses were depressed from 16mmHg to 3mmHg and 19mmHg to 7mmHg respectively. Finally, whilst DMSO was present in the bladder an initial increase in nerve activity was notable before an eventual suppression below baseline was recorded.

Conclusion

Preliminary findings indicate that DMSO may increase bladder capacity initially, however over time its effects on compliance are inhibitory. It can also be understood that a decrease in residual volume in the bladder occurs following treatment. Peak contractions elicited by purinergic receptor (ABMA) and muscarinic receptor (carbachol) agonists decrease in the presence of DMSO. Lastly, though the initial addition of DMSO had caused a large increase in nerve activity, overtime this decreased. The completed study can be used to understand the compliance and sensory changes that occur in patients with IC/PBS following intravesical DMSO treatment.

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LP8: Synthesis and Evaluation of Sialyltransferase Inhibitors

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Background

Sialyltransferases catalyse the transfer of sialic acids to the cell surface and hence participate in key biophysiological processes in human health and diseases, such as cancer. Enhanced tumour progression due to the overexpression of α2,3-sialyltransferases in cervical cancer underlines the importance of sialyltransferases as a potent therapeutic target in anticancer drug development. This project aimed to design and synthesis potent sialyltransferase inhibitors and evaluate the extent of sialylation caused by the proposed compounds.

Method

Lithocholic acids are known to inhibit α2,3-sialyltransferase activities non-competitively. Hence potent screening compounds were pharmacokinetically designed. HeLa cells were treated with synthesised compounds (150μm) for 48 hours. Maakia amurensis lectin was used to detect α2,3-sialyltransferase activities, and sambucus nigra lectin was used to detect α2,6-sialyltransferase activities. The lectins were

attached with respective fluorochromes that were quantified via a flow cytometer.

Results

A total of 18 lithocholic acid derivatives were designed and synthesised successfully. Preliminary results indicate that the proposed method can evaluate the extent of sialylation caused by the proposed compounds by measuring the median frequency intensity.

Conclusion

There is a need to search for a potent sialyltransferase inhibitor to understand the role of sialylation in cancer cells. The proposed method can be applied to evaluate the extent a novel compound could act as a potent sialyltransferase inhibitor in cancer cells. This research may provide a promising new strategy to treat cancer without disturbing physiologically important sialylation.

LP9: Quantifying of CD117+, and FcεRIα+ Mast Cells in CD45.2+ Populations in Peritoneal Tissue and Peritoneal Fluid

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Background

Mast cells are tissue-resident immune cells derived from $CD34^{+}$ progenitor cells in the bone marrow. Mast cells are thought to be present within most tissues of the body, although their overall distribution is still not fully understood. The aim of this project is to quantify mast cells in various regions of the body, such as the peritoneal tissue and peritoneal fluid.

Method

This study has animal ethics approval by the University of Queensland's Molecular Biosciences Animal Ethics Committee (BOND/ANRFA/162/20) under a shared tissue agreement. Flow cytometry was used to assess the prevalence of mast cells in the peritoneal tissue and peritoneal fluid of C57BL/6J mice. CD45.2, CD117, CD34, and FcεRIα antibodies were used to identify mast cells.

Results

Preliminary data suggests that CD117+FcεRIα+ mast cells constitute 0.0006547% of CD45.2+ haematopoietic cells in the peritoneal tissue (n=3) and 0.0001873% of CD45.2+ haematopoietic cells in peritoneal fluid (n=3).

Conclusion

These data suggest that mast cells constitute a greater proportion of haematopoietic cells within peritoneal tissue, and a lower proportion of haematopoietic cells in peritoneal fluid of C57BL/6J mice. These data will be used to further the current understanding towards the systemic distribution of mast cells within C57BL/6J mice. Further studies in this area may also facilitate an enhanced understanding of how the distribution and prevalence of mast cells changes during inflammatory diseases.

OP7: Mobile phones are potentially hazardous fomites warranting strong public health and biosecurity protocols

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Background

In 2021, billions of mobile phones are in circulation with roughly three-quarters of mobile handsets being smartphones. Whilst individuals wash their hands, mobile devices and smartphones are rarely cleaned. This enables continual re-contamination of hands via device interaction allowing pathogens to by-pass gold standard handwashing via these 'Trojan Horse' fomites. This research aimed to expose mobile

phones as breeding-ground platforms for pathogens.

Method

We conducted five studies. The first study was a systematic review evaluating 56 studies of phone contamination from both community and hospital environments. Our second study was a survey of 165 healthcare staff characterising the role of phones in the professional setting. Our third study was a hospital investigation exploring three wards and employing a mixed-methods protocol of culture and metagenomic sequencing. Our fourth study was a community investigation to determine contamination variance between hospital and community phones. Our fifth study explored the presence of SARS-CoV-2 contamination of phones used in an infection control ward.

Results

Our review demonstrated that 68% of mobile phones are contaminated with microorganisms and healthcare-derived phones have higher amounts of antimicrobial resistance. Our survey analysis revealed that 57% never cleaned their phones, and 52% use their devices in the toilet. Our hospital-based study demonstrated that the neonatal intensive care unit contained higher amounts of antimicrobial resistance compared to the other wards. Our community study uncovered 173 bacteria, eight fungi, eight protists, 53 bacteriophages, 317 virulence factor genes and 41 distinct antibiotic-resistant genes across five phones. Our fifth study confirmed the presence of SARS-CoV-2 on a healthcare worker's phone which was decontaminated with an alcohol-based wipe.

Conclusion

Mobile phones pose a major public health and biosecurity risk as these 'Trojan Horse' devices enable the spread of pathogens globally. Public health authorities must enforce policies regarding mobile phone use in the clinical setting and employ scientifically validated decontamination protocols.

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LP10: Dietary Strategies for Chemotherapy-Induced Nausea and Vomiting: A Systematic Review

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Background

Chemotherapy-induced nausea and vomiting (CINV) is among the most distressing cancer treatment side effects, affecting 20-70% of patients despite routine antiemetic prescription. Although routinely used in clinical practice, there is lack of data synthesis to determine which dietary strategies for CINV are supported by quality evidence. Therefore, this review aimed to examine

the effect of non-nutraceutical dietary strategies on CINV in adults compared with no intervention, usual care, or alternative strategies.

Method

Five databases were searched from inception to July 2021 for studies of interventional or observational design. The quality of evidence was appraised using the Academy of Nutrition and Dietetics Quality Criteria Checklist. Data were synthesized narratively and GRADE assessment of the certainty of evidence was applied.

Results

Twenty-one studies were included with 33% having low risk of bias. An association was found between improved CINV and alcohol intake; ginger tea; adequate energy, protein, fat, and carbohydrate; Mediterranean diet; and CINV-specific dietitian consultations or written information. A positive non-significant association was found between CINV and intake of grape juice and non-CINV specific dietitian consultations. No association was found for restricting oils, processed meats, fruits, vegetables, and dairy products; a colourless odorless diet; fasting with or without ketogenic diet; eating small frequent meals or avoiding food odours; and dietary education from an inpatient kitchen assistant or cancer nurse. The GRADE level of evidence was very low-to-low for most outcomes.

Conclusion

Improved CINV was associated with non-restrictive dietary strategies that promote adequate energy and macronutrient intakes, particularly protein, and include ginger, Mediterranean diet concepts, and moderate alcohol intake. Dietary strategies may best be implemented with ongoing education and support specific to CINV from health professionals with nutrition knowledge. However, future trials with adequate sample sizes, clearly defined dietary strategies, and valid outcome measures are warranted prior to being routinely prescribed alongside antiemetics.

STREAM 9: GLOBAL HEALTH PLANETARY HEALTH

PR46: Planetary Health: Addressing the impact of global environmental change on clean water and sanitation for homeless individuals in rural and regional Australia and providing a design-based system solution

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Background

Global Environmental Changes (GECs) are among a number of planetary-scale changes in the earth, spanning from large scale issues related to the global geosphere, to changes at community level related to human activities. In 2015, the UN developed a blueprint for peace and prosperity for the people and the planet known as the 17 Sustainable Development Goals (SDGs). SDGs address how vulnerable groups are more likely to experience negative impacts from global environmental change. People experiencing homelessness are among Australia's most socially and economically disadvantaged. They may not have access clean water and sanitation potentially leading to poorer health outcomes.

Methods

To explore potential solutions to achieve universal and equitable access to safe and affordable drinking water for homeless individuals in regional and rural Australia using a design thinking framework. The method consists of the five following stages - Empathise, Define, Ideate, Prototype and Test.

Results

The project outcomes were to design a range of solutions to tackle a Sustainable Development Goal 6 - Clean Water and Sanitation, in a vulnerable group of homeless individuals in Rural and Regional Australia. Using Target 6.1: "by 2030, achieve universal and equitable access to safe and affordable drinking for all". The indicator was: the proportion of population using safety managed drinking water services potential solutions, which were identified. These included Personal Filter Straws and Bicycle Water Purifiers.

Conclusion

Personal filter straws and bicycle water purifiers are potential solutions to address the goal of clean drinking water and sanitation in homeless individuals in regional and rural Australia. With all solutions come barriers including cost, distribution

and maintenance. Ultimately, benefits may outweigh potential setbacks to reduce the negative consequences of global environmental change on vulnerable individuals.

PR47: Alleviating the effects of climate change on the food security in Yemen

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Introduction

Mother nature has turned the rockets that are our advancements in health into boomerangs. They are now spinning back on us faster than ever before. Already facing war and socioeconomic collapse, climate change could be the force that takes Yemen down. Home to the biggest food security emergency in the world, it fails to meet the goals of the world. The Sustainable Development Goals endeavour to protect the planet and ensure peace and prosperity for all by 2030. As the climate crisis accelerates food insecurity, the pathway to achieving these goals becomes precarious. This project reveals how the failure to achieve the second global goal of "Zero Hunger" affects those in Yemen. It also explores meaningful solutions aimed to absorbing the sudden climate shocks that continue to impact this country.

Methods

Design-thinking was used to explore the core challenges of food security in Yemen and generate sustainable solutions.

Results

The global and local effects of climate change are deteriorating the lives of Yemeni people. Driven by the climbing prices in the world market to the extreme weather events locally, the prevalence of food security grows every year. This has forced families into starvation, migration, or sacrificing their child's education. This leads to rampant malnutrition, childhood stunting, and maternal mortality.

Conclusion

In war-torn Yemen, the effects of climate change reverberate across the food system. The withering progress towards the global goals should galvanise international organisations and leaders to creating sustainable measures.

PR48: The Efficacy of Oral Phenylephrine as a Decongestant: A Systematic Review Update

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Background

Phenylephrine (PE) is a non-prescription decongestant registered on the Australian Register of Therapeutic Goods (ARTG). However, there are no published systematic reviews supporting the efficacy and safety of this product for this use.

Objective

To examine the efficacy of oral PE as a nasal decongestant for patients aged over 12 years with symptoms of nasal congestion (i.e., allergic rhinitis, influenza-like illness).

Method

PubMed, EMBASE and the Cochrane Central Registry of Controlled Trials were searched for English and non-English studies published through December 2020 that measured the efficacy of phenylephrine in patients with nasal congestion. Studies included in the analysis were randomised, placebo-controlled trials measuring the effects of phenylephrine. Combination products with phenylephrine and other active decongestants were excluded. Two investigators independently extracted data on nasal airway resistance (NAR), self-reported decongestant scores and adverse reactions from each of the included studies. Continuous outcomes including nasal airway resistance and symptom reduction were analysed using weighted mean differences; or standardised mean differences if different measurement scales were used.

Results

Three randomised placebo trials evaluating the efficacy and safety of phenylephrine were included for analysis. All three studies demonstrated no statistically significant improvement with PE compared with a placebo in their self-reported symptom scores and rhinomanometry results. There was significant heterogeneity among the studies included in this analysis, which was

attributed due to different methodologies and scoring systems used. Because of this summarising primary endpoint results was not possible.

Conclusion

There is no evidence that phenylephrine is effective for non-prescription use as a nasal decongestant. This is in congruence with previous reviews like *Hatton et al*. Based on this review, we recommend that the TGA review the efficacy and safety of this common ingredient in decongestant products.

PR49: Climate change and zero hunger in Bangladesh: Design and systems-based solutions

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Introduction

Human development has come at a significant cost to the planet, resulting in global environmental changes (GEC). Climate change is one of detrimental consequences and is significantly impacting the livelihood and health of the people. The country frequently experiences extreme climate events such as cyclones and floods along with rising sea levels and temperatures, heavy rainfall, landslides, erosion and salinity. These further exacerbate poverty, food insecurity and poor health outcomes, whilst threatening the agricultural industry, which is one of the primary economic drivers of the country. Consequently, the country battles extreme hunger, food insecurity and malnutrition. At the current rate, the situation will worsen and present a challenge for achieving the United Nation's Sustainable Development Goal (SDG) 2, which aims to end hunger, achieve food security and improved nutrition and promote sustainable agriculture.

Methods

Undertake a search of the literature to identify potential solutions to address food insecurity and malnutrition and identify possible strategies to build sustainable agriculture. The feasibility and applicability of design and systems-based solutions will be explored in this context.

Results

Research of existing and novel strategies in Bangladesh and other countries, found that both design and system-based solutions may be beneficial when applied in the right context. Furthermore, existing solutions need to be modified, adapted and disseminated equally across the country. Maternal education has shown to be beneficial for reducing malnutrition and strategies should aim to scale-up education programs across the country. A combination of adaptation, mitigation and resilience when developing solutions is key to sustainable agriculture.

Conclusion

Achievement of SDG 2-Zero Hunger requires implementation of a combination of strategies aimed at mitigating, adapting and building resilience to the harms of climate change in agriculture. Design and systems-based solutions are both feasible, given the right context.

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PR50: Understanding the role of socioeconomic risk factors in predicting COVID-19 diagnoses: a machine learning approach

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Introduction

The COVID-19 pandemic has had a significant impact worldwide. In current literature,

socioeconomic risk factors associated with greater COVID-19 diagnoses were: increased age, male sex, ethnic minorities, low household income, overcrowding and poor health literacy. This project aimed to understand the role of socioeconomic risk factors in predicting COVID-19 diagnoses by employing the random forests algorithm to analyse the 2021 UK Household Survey.

Method

The raw dataset was cleaned, explored, feature engineered and split into a train and test set. Five models, one decision tree and four random forests, were trained and optimized, and their performances were evaluated on the test set. Performance metrics used were: F1, ROAUC, precision, sensitivity and specificity.

Results

The best random forests model displayed an F1 of 0.72, ROAUC of 0.82, precision of 0.76, sensitivity of 0.67 and specificity of 0.97, suggesting a reliable model. Variables considered important were consistent with the literature findings, which included: middle-aged people, male sex and low-income status and over-crowding. New important predictors identified were: dysfunctional family relationships, poor mental health and wellbeing, smoking, alcohol consumption and lack of exercise. Importantly, the model demonstrated that, compared with clinical variables, socioeconomic variables were less important predictors of a positive diagnosis, and need to be used with clinical variables for reliable predictions.

Conclusion

Socioeconomic risk factors play an important role in predicting COVID-19 diagnoses when used together with clinical variables. Machine learning tools that incorporate both these variables have a promising potential to improve diagnostic ability in resource-limited settings.

PR51: Foundations of teaching: Development of renal pathology and pharmacology revision tool for second year medical students

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Introduction

The skill of teaching in medicine is an essential, yet an overlooked part of the job. Having attended nearly two years of clinical placement, I realised that interns and residents have been assuming the role of a medical educator without any formal training. As medicine is a field that heavily relies on education from superiors, there is a greater need to incorporate teaching skills in medical education. Hence, in order to become better prepared for the future, I chose this MD project to gain theoretical knowledge of medical education, understand different roles of a teacher and apply these in the development of an educational resource.

Methods

This project was completed in two parts: 1) completion of AMEE Student Essential Skills in Medicine Education (ESME) course, and 2) Development of renal pathology and pharmacology revision tool.

Project Outputs

By successfully completing the online Student ESME course, I have gained an insight into the foundations of medical education, acquired basic teaching skills, and understood several roles of a teacher. I have also developed an interactive 140 slide PowerPoint for renal pathology and pharmacology revision, specifically aimed at second year medical students. Additionally, I have also enhanced my skills in the use of digital technology, learnt to receive and apply feedback and strengthen critical thinking skills.

Conclusion

As someone who is interested in teaching, I have gained innumerable skills by completing this MD project that I will continue to develop in the future, both in clinical practise and in an academic facility.

PR52: Are PARP inhibitors and chemotherapy effective in treating germline *BRCA* positive pancreatic cancer? A systematic review protocol

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Background

Pancreatic cancer is the 7th highest cause of cancer mortality in the world associated with a poor five-year survival rate. A strong risk factor identified in the development of pancreatic cancer is the presence of underlying germline *BRCA* 1

and *BRCA* 2 mutations. Current treatment options for advanced pancreatic cancer are limited and associated with significant adverse effects and minimally prolongs survival. New evidence from clinical trials has demonstrated the efficacy of Poly-ADP ribose polymerase inhibitors (PARPi) in conjunction with chemotherapy in treating *BRCA* mutated pancreatic cancer.

Methods

A systematic review of randomised controlled trials (RCTs) will be conducted. PubMED, EMBASE, CINAHL, CENTRAL, Clinical trials will be searched as well as Government databases from 2019 -2029. We will include studies that use our patient demographic, utilise PARPi with chemotherapy and reports median progression free survival as the primary outcome. Study selection will follow the Preferred Reporting Items for Systematic Reviews and Meta Analyses and methodological appraisal of the studies will be assessed using the Cochrane Risk-of-Bias tool for RCTs. We will undertake a meta-analysis using a random effects model to synthesize the data by pooling the results of the studies included. The effect size will be expressed as hazard ratios, and statistics will be used to assess heterogeneity and identify possible sources.

Conclusion

The results of this systematic review will be useful in establishing the effectiveness of a PARPi and chemotherapy regimens in treating *BRCA* mutated pancreatic cancer and thus its potential implementation in future practice.

PR53: The use of CT-chest imaging as a predictive factor of mortality in COVID-19 patients: A protocol for systematic review and meta- analysis.

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Background

Patients infected with COVID-19 commonly present with symptoms resembling influenza, contributing to the difficulty in detecting and treating the disease. Currently, chest computed tomographic (CT) scans are not recommended as a prognostic tool, howeverit may aid in rapidly triaging patients. This protocol aims to analyse the prognostic ability of CT findings in COVID-19 patients.

Method

A retrospective cohort study will be conducted on all published and unpublished studies from Cochrane Central Register of Controlled Trials, MEDLINE, Embase, ClinicalTrials.gov, WHO ICTRP and ANZCTR during December 2019 to April 2021; on all paediatric and adult patients with a confirmed COVID-19 RT-PCR with those who received chest CT. The search strategy will be based on the PRESS standard, data extraction and management will be based on CHARMS-Prognostic checklist.[1] The protocol will adhere to the PRISMA-P Statement19. ROBINS-I tool will be utilised for risk of bias.[2] Our primary outcome will be mortality. If sufficient data is available, a meta-analysis will be conduced. We will present the outcome in a risk ratio (RR) with a 95% CI and grade the quality of evidence based on the GRADE criteria.

Conclusion

This review aims to shed light on whether CT-scans, based on Yang et al. CT-SS criteria,[3] can be utilised in predicting mortality in COVID-19 patients. Thus, if CT severity scores can be incorporated into local guidelines, it can potentially save a patient's life as clinicians will be able to successfully triage those individuals.

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STREAM 10: MEDICAL EDUCATION (TECHNOLOGY AND SIMULATION)

PR54: Simulation-based education: a student perspective

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Introduction

This is a report on Simulation-Based Education (SBE) in healthcare, conducted over a seven-week period with Gold Coast Health and Bond University Faculty of Health Sciences and Medicine. The learning objectives of this project include learning the components of an effective simulation, working with different simulation modalities, and understanding the role SBE plays in a 21st century medical school curriculum.

Project Outputs

The project encompassed activities in various components of SBE, taking on roles in delivering and planning healthcare simulations, the Bond Virtual Hospital (BVH), and a moulage project. This was followed by discussions pertaining to equity, diversity and inclusivity, relevant literature on SBE, expectations of the simulated patient and self-evaluation of personal performance.

Results

Facilitating BVH sessions allowed us to understand that there was a stark contrast between learning content and teaching content. Behavioural skills such as communication and debriefing with good judgement[1] became more pertinent that ever before. The moulage project and simulation workshops further explored methods in which higher levels of fidelity can be achieved. Components of simulation such as pre-brief and de-brief utilising the PEARLS framework[2] further developed the process in which gaps in knowledge and skills could be identified and closed.

Conclusion

Through its many forms and modalities, SBE in medical education has the ultimate end goal of increasing the quality of patient-centred care. However, just as healthcare is constantly developing, the methods of SBE will continue to evolve as it nurtures and shapes future generations of healthcare professionals.

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OP9: Application of Gamified Virtual Laboratory to Aid in Multi-Modal Learning

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Background

With a growing demand for distance learning and open universities, combined with recent advances in technology, interest has turned to developing virtual alternatives to the traditional “hands-on” chemistry laboratories. With a larger proportion of tertiary students studying off-campus, these laboratory experiences need to be interactive, engaging, and informative to adequately substitute the laboratory experience. Here we describe the generation and investigation of a gamified, interactive virtual laboratory tool as both a replacement and as an additional resource to the traditional aspirin synthesis laboratory experiment.

Method

The virtual laboratory was designed using Camtasia and integrated into a 360-degree virtual tour using Lapentor. Student feedback was collected

anonymously using Qualtrix. Ethics approval was achieved Number: AT00333.

Results

Preliminary feedback from these two delivery formats indicates that off-campus students enjoyed, and were engaged with the interactive format, praising the one-on-one style experience and the ability to revisit areas of concern. Students utilising the virtual laboratory as a supplementary tool for their traditional laboratory experience also appreciated the opportunity to revisit areas of uncertainty. However, they perceived that they did not require the interactive tools as these skills had already been acquired in the physical laboratory.

Conclusion

Overall, this investigation shows promise for the interactive virtual laboratory as a beneficial resource for both complimenting the laboratories and acting as a substitution for the traditional laboratories.

PB7: Simulation Based Education

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Introduction

Simulation is now a critical part of healthcare training and quality improvement. It is a great way for individuals to learn new skills, for students to prepare for practice, and more recently, for hospital teams to get better at what they do. Simulation is practically broken up into three main components: a) he pre-brief, whereby the facilitator aims to establish rapport and psychological safety amongst members of the team prior to the simulation; b) the simulation, the actual clinical scenario where teams perform a combination of history, physical examinations and management of patients; c)the debrief, a contemplative component of simulation where each member is encouraged to reflect on their performance and the team dynamic, to identify take home key messages. The purpose of this project was to design, deliver and debrief simulation-based education.

Results

Over the course of our seven-week simulation-based education rotation, we had the opportunity to partake in various simulation-based activities through the Gold Coast University Hospital and Bond University. These simulations spanned multiple disciplines of medicine including, but not limited to, Emergency Medicine, Intensive Care, and Obstetrics and Gynaecology. This involved observing and participating in simulations, designing case scenarios for the Bond Virtual Hospital, making moulage and debriefing.

Conclusion

Through our participation in these various activities, we have been able to develop our skills in writing scenarios, moulage, running simulations and debriefing.

PR55: Enhancing dementia education through the use of augmented reality

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Introduction

Dementia education, including the anatomy and physiology of the brain, is an essential aspect of medical education. This study evaluated how augmented reality (AR), compared with 2D text-based learning, can improve knowledge in this area.

Method

A pilot randomised controlled trial was conducted with 24 medical students. The control group received a double-sided educational pamphlet, and the intervention group received an AR app where participants held a

cube in front of a tablet to visualise a 3D brain model, with the ability to freely rotate and dissect the model, along with a narrated verbatim lesson as per the pamphlet. Knowledge was assessed with a pre- and post-test with 15 developed multiple-choice questions with additional evaluation questions on both resources.

Results

Significant overall improvements from pre- to post-test scores ($p<.001$), with no significant difference between groups ($p=.667$) were found. Prior education was a significant covariate for pre-post change ($p=.016$), but this did not have a significant effect on group allocation ($p=0.126$). However, greater improvement was observed in the intervention group. Students found both the pamphlet and AR resources informative, easy to use, enjoyable, and helped develop their knowledge of dementia.

Conclusion

The use of AR, while effective, did not significantly improve knowledge of neuroanatomy in Alzheimer's Disease in medical students when compared to text-based learning. This may have been due to lack of time standardisation, unfamiliarity with the AR app, small sample size, or influence of prior education. Larger scale and more rigorous research are needed.

PB8: Development of assessment literacy through creation and analysis of a formative examination for medical students

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Kemmerling, Kristel, Assistant Professor, Health Sciences and Medicine, Bond University

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Munasinghe, Wisura, 5th year medical student, Health Sciences and Medicine, Bond University

Introduction

This project aimed to facilitate our development of assessment literacy skills by constructing a formative online open-book examination for fourth-year medical students. A group of six fifth-year students worked through workshops, online meetings, and an online Essential Skills in Medical Education (ESME) course to accomplish the intended learning outcomes.

Method

The exam consisted of 140 questions, including multiple-choice (MCQ) and key feature problems (KFP) questions. An exam blueprint was created to ensure that the exam represented a wide range of medical topics. Quality assurance was conducted throughout different stages of the project to improve medical accuracy and overall exam consistency.

Results

The task force completed a formative assessment with 92% of students offered the paper attempting it. The test was deemed reliable via a KR-20 score of 0.94. However, the exam was considered difficult, with only 1.83% of questions easy. The point biserial discrimination was satisfactory with only 12% of questions low discrimination and 0% negative. According to anecdotal evidence, the medical students found the formative exam harder than their summative paper.

Conclusion

The purpose of this project was to improve the team's level of assessment literacy. This project provided insight into the skills required to create a useful and fair assessment tool. As a group, we developed skills in appraising and editing assessment material and collating exam data to determine a fair and accurate cut score. This task, along with the ESME course, has been beneficial in enhancing the group's knowledge of assessment as a core component of medical education.

PR56: Simulation based education in healthcare

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Introduction

Simulation Based Education (SBE) is an integral educational tool in healthcare settings. Simulation provides medical students and healthcare workers the opportunity to obtain experience prior to, or in addition to immersion in the clinical environment (Cleland et al. 2016). The opportunity to complete a rotation as part of the SBE team for this MD project allowed us to develop skills in simulation scenario design, simulation technology and simulation modalities, teaching, moulage, pre-briefing and debriefing skills.

Simulation

Simulation is an application of Experiential Learning Theory (ELT); learning through experience, reflection on that experience, and incorporation of the lessons learnt into everyday behaviours (Fanning and Gabba, 2007). ELT comprises of four parts: concrete experience, reflective observation, abstract conceptualisation, and active experimentation. Simulation demonstrates all four phases of ELT (ibid). In this project we propose a parallel phase model for SBE consisting of pre-brief, simulation, debrief and growth phase.

Post-Simulation

Debriefing allows for reflective observation, it is a facilitated reflection, its purpose is to identify and close gaps in knowledge and skills, and to provide feedback (ibid). A useful tool for debriefing is the Promoting Excellence and Reflective Learning in Simulation (PEARL's) framework (Eppich and Cheng, 2015). Feedback delivery and personal implementation are intertwined yet crucial aspects of the debrief which directly affect the growth phase.

Conclusions

Throughout this MD project, we were able to develop knowledge, experience and skills in SBE including; pre-briefing and debriefing, teaching, moulage, and simulation design. This experience has highlighted the importance of medical education and simulation for all healthcare workers.

PR57: Simulation Based Healthcare Education

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Introduction

Simulation-based education (SBE) is being increasingly adopted amongst healthcare professionals. Rather than the traditional methods of information delivery, SBE provides an experience in which learners may practice and reflect in a safe, yet immersive clinical learning environment.

Aim

This project aimed to explore the theoretical frameworks of experiential learning theory, which underpin SBE, in addition to engaging with SBE through a seven-week placement with the Gold Coast University and Robina Hospital simulation teams.

Outputs

The placement provided an opportunity to engage with practical elements of simulation delivery including familiarisation with simulation planning, simulation technology (including iSimulate and SimMan3G), moulage and audio-visual technical systems set up. It also provided first-hand exposure to the models and functional implementation of simulation debriefing (PEARLS, Diamond and Advocacy-Inquiry) by master educators in Gold Coast Health. It also provided an opportunity to hone professional skills in education through debriefing students and developing cases for the Bond Virtual Hospital. Through this experience we were afforded many opportunities to develop professional skills in healthcare education and we extend a formal thank you to the Gold Coast Health and Bond Virtual Hospital teams for accommodating us throughout this project.

LP11: Using 3D holographic technology (HOLOLENS) for student learning and knowledge retention in disease education

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Introduction

Disease education is fundamental to the health science and medicine curricula, as it prepares students for their future careers. However, learning about disease can be challenging, as it requires an integration of many disciplines to fully comprehend the underlying mechanisms and treatments. By using technology-enhanced interventions, such as the HoloLens, the organ of interest can be presented in a three-dimensional (3D) space, with concepts further explained via audio means, to potentially increase learning and knowledge retention. Thus, this study assessed whether a textbook-style resource, or a 3D augmented reality HoloLens resource, would be more effective for student learning and knowledge retention in learning about asthma, as a model of disease.

Method

This randomised controlled study used a convenience sample of 65 first-year health science and medical students from Bond University. Participants were randomised into two groups to complete the same lesson on asthma, which was delivered through either the textbook-style resource (n=33) or the HoloLens (n=32). A pre-test prior to the lesson included multiple-choice questions for a baseline, with the post-test having additional multiple-choice questions and Likert-scale questions to assess learning. To assess knowledge retention, participants completed another test 2-weeks after the lesson, which included identical multiple-choice questions to the post-test.

Results

65 participants' test scores were included in the final analysis for learning, with 40 participants' scores further analysed for knowledge retention. Pre- and post-test scores revealed increased learning in both interventions ($P<0.001$), with slightly higher test results obtained by those using the textbook-style resource ($P=0.011$). The HoloLens was perceived as more enjoyable ($P<0.001$).

Conclusion

Although the textbook-style resource was more effective for increasing learning test results, participants perceived the HoloLens more favourably. This study presents both resources as reliable supplementary tools, while recommending the HoloLens as an option for integration in cases where educators wish to enhance student enjoyment of the learning experience.

POSTERS IGNITE: MORNING SESSION

IG1: A comparison of antiplatelets during the peri- and postoperative period following stent insertion for unruptured intracranial aneurysms: a systematic review

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Hattingh, Laetitia, Clinical researcher and senior pharmacist, Gold Coast University Hospital

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Hal Rice, Hal, Neuro-interventional radiologist, Gold Coast University Hospital

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Introduction

Intracranial aneurysms are relatively common, and when ruptured can lead to subarachnoid haemorrhage which is associated with high mortality. Flow diverter stents are a form of neuroendovascular intervention which have revolutionised treatment of intracranial aneurysms. However, the composition of these stents necessitates antiplatelet therapy in the perioperative period. The safety and efficacy of various antiplatelet regimens are not well established. The primary purpose of this systematic review was to determine the influence of various antiplatelets on peri- and postoperative outcomes following flow diversion for unruptured intracranial aneurysms.

Method

A systematic search was conducted of 4 electronic databases for studies published from January 2010 to November 2020, yielding 1049 articles. Inclusion criteria were English language primary research articles. Exclusion criteria were animal studies and a population of less than ten subjects. A meta-analysis was not conducted.

Results

22 studies were identified for inclusion with majority focusing on clopidogrel and aspirin. Overall, thromboembolic, and haemorrhagic complications were low. Studies comparing prasugrel and ticagrelor to clopidogrel supported their use as alternatives to clopidogrel.

Conclusion

The large proportion of studies investigating clopidogrel and aspirin therapy present a challenge in comparing antiplatelet regimens. Although prasugrel and ticagrelor were identified as suitable alternatives to clopidogrel, these studies had small cohort sizes. Findings also support the use of glycoprotein IIb/IIIa inhibitors as rescue therapy to treat acute thrombosis associated with flow diverter implantation. Further research is required to determine most suitable antiplatelet.

IG2: Effectiveness of Sacubitril plus Valsartan (Entresto) in preventing complications of reduced ejection fraction heart failure: Protocol for a Systematic Review

Shah, Anmol, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Introduction

According to the Heart Foundation, 110,000 (0.5%) Australians are currently living with heart failure. Whilst trends in prevalence have decreased over time, hospitalisation rates have remained steady at around 173 people per day or 1 person every 8 minutes. In addition, almost one in 50 deaths are attributed to heart failure, hence prompting an investigation into the efficacy of its management. Further investigation into the effectiveness of Entresto is warranted, given the significant burden of heart failure on the population and the potential benefits it may provide if trials show that it can be used as a first-line management option.

Objective

The aim of this systematic review is to assess the efficacy of sacubitril plus valsartan against ACE inhibitors in preventing re-hospitalisation and mortality in patients with reduced ejection fraction heart failure.

Methods

In order to ensure the highest quality of evidence is ascertained, only randomised control trials will be included in the systematic review. Participants included must have confirmed reduced ejection fraction heart failure on ECHO and be on maximal concurrent dose of a beta-blocker. PubMed, Embase, Trip and Cochrane Library databases will be searched to find eligible RCT's. Two reviewers will collate full text articles on EndNote and any disputes surrounding their inclusion in the study will be resolved by a third reviewer. Specific outcomes of mortality and hospitalisation will be analysed as well the occurrence of adverse effects in order to develop a safety profile. Outcomes will be presented as risk ratios in forest plots with sub-group analysis.

References

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IG3: Urate and other biochemical markers as prognostic indicators of adverse maternal and fetal outcomes in preeclamptic women: a retrospective cohort study

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Sivakumaran, Sivasaaini, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Math, Vanitha, Obstetrician and Gynaecologist, Gold Coast University Hospital

Objectives

To explore if elevated serum urate and other biochemical marker levels (Calcium, AST, ALT) in preeclamptic women in early pregnancy (20 weeks gestation) are useful prognostic indicators of adverse maternal and foetal outcomes. And to establish a predictive threshold value that indicates an increased risk of maternal complications.

Methods

A retrospective cohort study performed at Gold Coast University Hospital, involving 105 women who delivered at the hospital between January 2019 to December 2020. Preeclampsia was diagnosed based on local hospital guidelines. Serum levels of urate, calcium, AST and ALT were extracted from the initial blood tests performed at booking visit prior to 20 weeks gestation and were analysed against maternal and foetal outcomes.

Results

Serum uric acid at cut off 0.255 mmol/L was found to be a statistically significant predictor of general maternal complications (AUC 0.625, P=0.032) with a 52.3% sensitivity and 72.5% specificity. Women with high urate levels at booking visit are 2.9 times more likely to experience an adverse outcome (OR 2.89, 95% CI 1.24,6.75; P = 0.014). Serum urate at a cut-off of 0.255 mmol/L was found to be a statistically significant predictor of general foetal complications (AUC 0.621) with 50.7% sensitivity and 76.7% specificity. However, when compared individually with the adverse foetal outcomes, did not prove to be statistically significant. High serum calcium, AST and ALT at booking did not reveal a significant association with adverse maternal and foetal outcomes in women with preeclampsia (*P* > 0.05).

Conclusions

Maternal serum urate at booking is not a reliable predictor of maternal and foetal outcomes in women who develop pre-eclampsia/eclampsia, but it may play a role in establishing a global increase in risk. A larger cohort study is required to validate the reliability of these biomarkers.

IG4: Treating Primary Open-Angle Glaucoma which has failed monotherapy: Fixed Brinzolamide-Brimonidine versus Fixed Timolol-Latanoprost

Claremont, Craig, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Background

Primary open-angle glaucoma (POAG) is the second most common cause of irreversible blindness. Its progression from ocular hypertension can be halted or delayed through tight intraocular pressure (IOP) control. Topical medications provide a cheap and non-invasive solution, but monotherapy fails in 33 percent of this population. Fixed Timolol-Latanoprost Therapy (FTLT) is the most effective step-up currently as it delivers two different and highly potent medications in a single applicator. However, this comes with the potential side-effects of hypotension, bradycardia, and bronchospasm. Fixed Brinzolamide-Brimonidine Therapy (FBBT) presents a potential alternative with a milder side-effect profile. The purpose of this study is to generate high-level evidence comparing FBBT against FTLT in treating POAG which has failed monotherapy.

Methods

A multicentre randomised control trial (RCT) will be used to compare the effectiveness of FBBT against FTLT. 56 individuals aged 18 years and above, who have failed initial 3-month monotherapy with latanoprost will be selected from hospitals around Australia. Individuals who have had previous intraocular surgery, using other ocular medication, have another ocular pathology, or have unstable systemic disease will be excluded. The primary outcomes of mean '9am to 5pm' and '24-hour' IOPs. Secondary outcomes include visual field loss, and medication tolerability and safety. All outcomes will be measured at baseline and finally at the 12-week endpoint. Independent t-tests and chi-squared tests will then be used when per protocol analysis is performed.

Conclusion

This multicentre RCT will provide high-level evidence evaluating if FBBT is comparable to FTLT in treating POAG which has failed monotherapy.

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IG5: Stature and weight estimation using morphometric measurements of the second and third metacarpal bones from AP hand radiographs of 9 and 13-year-old Pari Papuan males and females: a retrospective study and literature review

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Introduction

This project investigated whether height, weight and wrist breadth can be estimated from morphometric measurements of the second (2-MTC) and third metacarpal (3-MTC) length, width, medullary cavity width, or cortical thickness from hand radiographs of 9-year-old and 13-year-old males from Pari, Papua New Guinea.

Method

The retrospective studies retrieved 68 and 31 anteroposterior (AP) radiographs of the hand of 9-year-old and 13-year-old males respectively, collected as a part of the International Biological Program conducted between 1968 to 1983. The physical radiographs were digitised, and ImageJ software was used to take morphometric measurements of the 2-MTC and 3-MTC. Pearson's correlation coefficient was used to analyse strength of relationship between morphometric measurements and physiological parameters. Significance ($P<0.05$) was determined using a table of critical values for Pearson's correlation coefficients.

Results

Amongst 9-year-old Pari Papuan males, although there was a small correlation between both subjects' height and weight, and the length, width, medullary cavity width, and cortical thickness of the 2-MTC and 3-MTC bones, this was not significant. In 13-year-old Pari Papuan males, there was significant moderate to strong correlation between both subjects' height and wrist breadth, and the length, width and cortical thickness of the 2-MTC and 3-MTC bones.

Conclusion

2-MTC and 3-MTC length, width, medullary cavity width and cortical thickness may not be effective in estimating stature and weight in 9-year-old Pari Papuan males. Furthermore, 2-MTC and 3-MTC length, width, and cortical thickness may be effective in estimating stature and wrist breadth in 13-year-old Pari Papuan males.

IG6: Learning Plan for Medical Students on a 7-Week Paediatric Placement

Sun, Melinda, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Background

This learning plan has been designed specifically for Bond University medical students who will be attending a 7-week paediatric placement at a hospital during their first clinical year. These medical students may have had little-to-no clinical prior experience with children (and their parents/caregivers), which can cause feelings of anxiousness and apprehension approaching this placement. This learning plan aimed to help students build self-confidence in assessing children and communicating with their parents/ caregivers in the healthcare setting through multi-modal learning activities that allows them to achieve expected competency requirements for this placement.

Learning Engagement and Activities

The activities that form this learning plan consists of weekly student-led education sessions, formal supervision sessions with a designated Paediatrician, simulation sessions and peer mentoring sessions. These activities will provide medical students with substantial opportunities to fulfil their workplace-based assessments required by the Bond Medical Program.

Justification of Learning Plan

For medical students to achieve an optimal level of learning through this placement, this learning plan has been designed following multiple theories and practices of learning in healthcare. These include Knowle's principles of adult learning (Kaufman, 2003), Kolb's experiential learning theory (2014), Billett's workplace learning theory (2015), and utilisation of mentoring and supervision relationships.

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IG7: The Efficacy of Oral Phenylephrine as a Decongestant: A Systematic Review Update

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Stehlik, Paulina, Senior Research Fellow, Institute for Evidence-based Medicine, Faculty of Health Sciences and Medicine, Bond University

Background

Phenylephrine (PE) is a non-prescription decongestant registered on the Australian Register of Therapeutic Goods (ARTG). However, there are no published systematic reviews supporting the efficacy and safety of this product for this use.

Objective

To examine the efficacy of oral PE as a nasal decongestant for patients aged over 12 years with symptoms of nasal congestion (i.e., allergic rhinitis, influenza-like illness).

Method

PubMed, EMBASE and the Cochrane Central Registry of Controlled Trials were searched for English and non-English studies published through December 2020 that measured the efficacy of phenylephrine in patients with nasal congestion. Studies included in the analysis were randomised, placebo-controlled trials measuring the effects of phenylephrine. Combination products with phenylephrine and other active decongestants were excluded. Two investigators independently extracted data on nasal airway resistance (NAR), self-reported decongestant scores and adverse reactions from each of the included studies. Continuous outcomes including nasal airway resistance and symptom reduction were analysed using weighted mean differences; or standardised mean differences if different measurement scales were used.

Results

Three randomised placebo trials evaluating the efficacy and safety of phenylephrine were included for analysis. All three studies demonstrated no statistically significant improvement with PE compared with a placebo in their self-reported symptom scores and rhinomanometry results. There was significant heterogeneity among the studies included in this analysis, which were attributed due to different methodologies and scoring systems used. Because of this summarising primary endpoint results was not possible.

Conclusion

There is no evidence that phenylephrine is effective for non-prescription use as a nasal decongestant. This is in congruence with previous reviews like *Hatton et al*. Based on this review, we recommend that the TGA review the efficacy and safety of this common ingredient in decongestant products.

IG8: The Impact of Climate Change on Achieving the Sustainable Development Goal of "Zero Hunger" for Children of the Solomon Islands and Proposing Systemic Design Thinking Solutions

Dwyer, Rose, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Introduction:

The health of humanity and the planet are remarkably interconnected. Anthropogenic changes, including climate change, are threatening human health and well-being. This project explored the converging crisis of climate change and vulnerable communities and the impact on human health outcomes. Specifically, the ongoing impact of climate change on achieving the Sustainable Development Goal (SDG) of *"Zero Hunger"* for children of the Solomon Islands and potential systemic design thinking solutions was investigated.

Method

A literature search was performed using electronic databases and core journals. The literature search also covered papers, reports, guidelines and communications published by Government and non-Government organisations. This method allowed for the development of a comprehensive analysis of the literature.

Results

The findings of this project highlighted the complexity of the interconnection between the impacts of climate change and SDG outcomes in the Solomon Islands. Children of the Solomons are experiencing a disproportionate prevalence of food insecurity, undernourishment, stunting and malnutrition. Five key climate change phenomena, including increasing temperatures, altered rainfall, tropical cyclones, sea-level rise and ocean acidification, are predicted to worsen this. Climate change is currently and will continue to undermine

the potential of the SDG of *"Zero Hunger"* for children of the Solomon Islands to be met. As determined through the literature, sustainable systemic design thinking and pragmatic optimism thinking solutions are required. Suitable evidence-based solutions were established in terms of climate change mitigation, adaptation and resilience.

Conclusion

Children of the Solomon Islands will not be able to achieve the targets and indicators associated with the goal of "*Zero Hunger*" unless systemic design thinking solutions incorporating mitigation, adaptation and resilience are actioned.

POSTERS IGNITE: AFTERNOON SESSION

IG9: Does chronic exposure to low levels of ionizing radiation in radiologists result in higher cancer rates: a prospective cohort study

Nowshadi, Daniel, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Introduction/Background

Ionizing radiation is a double-edged sword. It is indispensable in medical practice having diagnostic and therapeutic utility. However, it can also induce fibrosis, mutagenesis, carcinogenesis, and teratogenesis under certain circumstances. An increased incidence of neoplasms may occur in any organ after exposure to ionizing radiation, though closer associations have been found with leukemias and solid tumours of the thyroid, breast, lungs, and brain. The primary objective of this study is to investigate whether radiologists develop more cancers earlier on as compared to doctors without occupational exposure to ionizing radiation. A literature review has identified a deficiency of recent rigorous studies answering this important question.

Methods

A prospective cohort study will be used to follow a cohort of radiologists and general practitioners from the time they graduate from their training programs and become fellows, till death or loss to follow-up. Key outcomes in this study are 'time to first formal cancer diagnoses, and 'cancer-related mortality'. Data will be acquired at baseline and yearly thereafter via self-reported online forms sent to participant email addresses. We will calculate the adjusted relative risk of cancer-related death and 95% confidence interval by using Cox proportional hazards regression. Survival analysis (time to cancer diagnosis) will be conducted on both groups separately and compared.

Conclusion

Up-to-date and reliable evidence characterizing the cancer risk of radiologists is important in informing safety measures that should evolve with radiological practice. This prospective cohort study will provide high-level evidence comparing the cancer burden in radiologists to that of GPs.

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IG10: Investigating the Impact of Climate Change on Mental Health in the Context of Sustainable Development Goal Three: Good Health and Wellbeing, in The Torres Strait Island Population, and future solutions

O'Reilly, Gabrielle, 5th Year Medical Student, Health Sciences and Medicine, Bond University

Introduction/ Background

The health of the environment and its ecosystems is interconnected to the health and wellbeing of humans. Climate change is the largest threat to human civilisation at present. Research has linked poor mental health outcomes and suicide mortality with changing climate and extreme weather events. The Torres Strait is among one of the most vulnerable regions to climate change, due to a combination of geographic location and pre-existing social and economic disadvantage. This project explored the impact of climate change on the mental health of Torres Strait Islanders in the context of Sustainable Development Goal (SDG) Three "Good Health and Wellbeing" and investigated potential solutions using design and systems thinking.

Method

A literature search was conducted using electronic databases and core journals. The literature search also included organisational reports, government reports and guidelines, and Torres Strait Island Regional Council research reports. This allowed a comprehensive analysis of the literature.

Results

The findings from this project highlighted how the mental health and wellbeing of Torres Strait Islander Peoples will be significantly impacted by the effects of climate change, particularly cultural identity and connection to Country. Climate change will hamper the ability to achieve SDG 3 - mental health and suicide. Strength-based solutions that build on the resilience and adaptative capacity of Torres Strait Island Peoples is required. Evidence based solutions have been proposed using a design and systems thinking approach.

Conclusion

The Torres Strait Islander population will not be able to achieve the target and indictor associated with mental health and suicidality, in the context of SDG 3 "Good Health and Wellbeing" unless appropriate solutions that focus on building resilience and adaptive capacity to climate change are further implemented.

IG11: Audit of caesarean sections prior to 39 weeks' gestation at The Tweed Hospital

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Green, Patricia, Assistant Professor, Clinical Skills, Health Sciences and Medicine, Bond University

Rathbone, Evelyne, Senior Teaching Fellow, Biostatistics, Faculty of Health Sciences and Medicine, Bond University

Introduction

According to RANZCOG guidelines, caesarean sections without an appropriate indication should be performed at approximately 39 weeks' gestation. This timing is thought to balance neonatal complications associated with early gestation to the risks associated with early labour. Research has suggested the rates of nonindicated caesarean sections performed at <39 weeks' gestation is high within Australia. This audit aims to determine the indications for caesarean sections occurring prior to 39 weeks' gestation within the Tweed Hospital Birth Service and analyse relevant foetal outcomes.

Method

This audit retrospectively collected data from years 2017 to 2020 using the eMaternity database, with 261 caesarean sections births occurring at <39 weeks' gestation. Indications for delivery were determined, and foetal outcomes were collated. These data were analysed via Microsoft Excel and SPSS.

Results

36 of the 261 (13.2%) births occurring at <39 weeks' gestation had no clear medical indication. There were no significant findings in APGAR score at 5 minutes, respiratory complications and nursery admission between nonindicated caesarean sections <39 weeks' gestation and caesarean sections >39 weeks' gestation.

Conclusions

This audit documented a lower rate of nonindicated caesarean sections <39 weeks' gestation than the results of a 2015 national audit, with no association between early gestational delivery and adverse neonatal outcomes. Several strategies can be implemented to further reduce this rate and improve hospital documentation. Further studies should be conducted on a larger scale to determine if there is a relationship between nonindicated CS<39 weeks' gestation and neonatal complications.

IG12: Essential ECG's

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McLean, Michelle, Professor of Medical Education, Health Sciences and Medicine, Bond University

Kennedy, Sacha, Assistant Professor, Health Sciences and Medicine Bond University,

Introduction

This MD professional project enabled me to explore medical education and develop a deep understanding of effective medical teaching and learning in an area of my own personal interest. Medical professionals are constantly teaching, whether it be to patients, junior staff, or peers.

Literature has shown that learning about medical education makes professionals more effective educators and learners. The learning outcomes for this project are: (1) to learn and apply the fundamentals of medical teaching to be an effective learner and educator throughout my medical career; (2) to apply this knowledge to develop a resource that will effectively further students understanding of a key medical topic, ECGs; (3) use case-based learning to increase the practicality of the resource; and (4) foster students enjoyment about ECGs and encourage further exploration of the topic by making the content accessible and easy to comprehend.

Outputs and methods

The outputs for this project are: (1) completion of the Association of Medical Education in Europe's (AMEE) Student Essential Skills in Medical Education (ESME) online course; and (2) creation of an educational resource for clinical year students, providing 10 clinical ECG cases with worked answers.

Conclusion

Through completing these tasks, the learning outcomes were achieved, and I feel confident that the skills that I have learnt will be invaluable in my future practice. I also hope to use this newfound knowledge to encourage other students to pursue further

IG13: Assessment of Knowledge Regarding Modifiable Risk Factors Among Patients with Atrial Fibrillation

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Background

Atrial fibrillation (AF) is the most common arrhythmia and presents a significant burden to patients and the Australian healthcare system. The majority of risk factors for AF development and AF burden are modifiable. However, the clinical management of this condition currently focuses on rhythm and rate control medication, cardioversion, and ablation therapies. This cross-sectional study aimed to determine the baseline level of knowledge regarding AF risk factors among patients with a diagnosis of AF.

Method

The survey was conducted at the Gold Coast University Hospital and the inclusion criteria included patients of age 18 years and above, a diagnosis of AF and ability to give consent. The study assessed knowledge with a multiple-choice question survey with seven questions. A total of sixty surveys were collected for data analysis.

Results

Participants demonstrated a moderate level of knowledge with a mean score of 71.82%. Ischaemic heart disease and the total number of risk factors were significant predictors of AF knowledge. Statistical analyses showed that survey scores were not influenced by age, gender, or the other comorbidities investigated.

Conclusion

This study is the first to assess patient knowledge regarding the modifiable risk factors of AF. With further research, the baseline level of knowledge among AF patients can be established and utilised as the foundation for educational interventions in the future. A more focussed approach based upon educating patients and optimising their risk factor profile is fundamental in reducing the increasing AF epidemic in Australia.

IG14: Dabigatran versus warfarin for stroke prevention in mechanical heart valve patients with underlying atrial fibrillation: A Protocol for Systematic Review and Meta-Analysis

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Background

This Master of Healthcare Innovations subject outlined the process of creating a systematic review with meta-analysis, the highest level of evidence for a proposed treatment research question. This involved critically appraising an existing systematic review, attaining data analysis techniques, and developing a protocol using the PRISMA-P checklist.

Introduction

Cardioembolic stroke is an important complication of atrial fibrillation, especially in mechanical heart valve patients. Although warfarin is the current gold

standard anticoagulant for these patients, NOACs such as dabigatran are beginning to show favourable efficacy and safety. This proposed systematic review with meta-analysis will investigate the efficacy of dabigatran in preventing stroke and systemic embolism in these patients. Safety will also be assessed by evaluating intracranial bleeding and mortality as secondary outcomes.

Methods

A pre-specified search strategy will be used to search PubMed, EMBASE and Cochrane Library for relevant randomised controlled trials that will be included based on strict eligibility criteria. The Cochrane risk-of-bias tool will be used to assess these studies and pertinent data items will be extracted and investigated through meta-analysis. Unit of analysis issues, missing data, reporting bias, methodological and statistical and heterogeneity will be evaluated and handled appropriately. Subgroup analysis may be utilised if significant heterogeneity arises. Conclusions will be drawn from confidence intervals and risk ratios to provide informative and clinically relevant recommendations.

Conclusion

Given the benefits of non-vitamin K oral anticoagulation, this developing field of research has the potential to change current guidelines.

IG15: Applying the Knowledge-to-Action Framework to implement evidence-informed interventions to increase the uptake of Ottawa Ankle Foot Clinical Decision Rule in two Emergency Departments.

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Background

Acute ankle and foot injuries are common presentations in Emergency Departments (ED). Radiography is not always necessary for ruling out ankle or foot fractures. The Ottawa Ankle Foot Rule (OAFR) is a high-quality evidence-based clinical decision rule which is used to select patients with ankle and foot injury for X-rays. However, its application is sub-optimal in ED.

Objective

This report proposes evidence-based strategies and a clinical implementation plan guided by the Knowledge-to-Action (KTA) framework, to increase the uptake of OAFR within ED.

Method

A baseline audit will be conducted to assess current use of OAFR and X-rays for acute ankle and foot trauma at two ED intervention sites. Barrier analysis will be undertaken through key informant interviews and focus group interviews with ED and radiology staff. Proposed strategies for change include education, reminders, leadership support, team conference reporting of progress, audit, and feedback. Key improvement outcomes will be monitored during the implementation and postimplementation period through audits and surveys. Results will be presented in descriptive and quantitative statistics.

Results

Numerous barriers and facilitators of the use of OAFR in ED were identified. Key improvement outcomes included frequency of use of OAFR in ED, percentage of radiographic imaging, ED length of stay of patients, reduction in healthcare cost, and patient satisfaction.

Conclusion

The level of adherence to the proposed strategies reflects the success of this implementation plan. The plan moving forward is to assess the OAFR adherences rate of healthcare professionals following the implementation of KT strategies and ensuring the sustainability of the proposed project.

IG16: Efficacy of Garcinia Cambogia (HCA) in reducing body weight in overweight and obese adults: A Scoping Review

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Background

Consumers expect that medicine available for purchase over-the-counter have had their quality, safety and efficacy assured by the Therapeutic Goods Administration (TGA). Whilst this is the case for registered products (labelled AUST-R), it is not the case for listed complementary medicines

(labelled AUST-L). The TGA regulates listed products by a light-touch system that trusts medicine sponsors to obey the rules.

Objective:

This scoping review investigates the weight loss claims made by listed products containing Garcinia Cambogia (from which hydroxycitric acid (HCA) is thought to be the active component). Examples include Garcinia Max (AUST L 266921)(1) and Thinco Garcinia Supreme (AUST L 213557)(2).

Method

Only studies which compared Garcinia Cambogia to placebo were included and the variables of weight change and BMI change were analysed. Double-blinded RCT's and systematic reviews of RCT's were included in the analysis.

Results

Of the 14 included studies, all failed to demonstrate a clinically significant decrease in weight or BMI. Thus, none of the included studies provides sufficient evidence to support the claims made by listed weight-loss products containing Garcinia Cambogia (HCA).

Conclusion

There is a significant problem regarding the standardisation of herbal products in general. Future trials, if done, need to have parameters matching those set out in the TGA evidence guidelines and the CONSORT guidelines for reporting randomized, controlled trials of herbal interventions (3).

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Thank you
for your
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