Delphi assessment of audit and research priorities in an emergency department.

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Abstract

Objective

Audit and research projects in the emergency department (ED) are important to improve patient care but can be time and resource consuming. We identified and prioritised audit and research topics among multidisciplinary ED staff to fill perceived knowledge gaps, encourage engagement, reduce duplication, and facilitate translation of evidence into clinical practice.

Methods

A two-stage electronic Delphi survey process was undertaken by senior medical, nursing, education and social work staff at the Royal Children's Hospital, Victoria. Survey one collected demographic data and audit and research ideas following a series of open-ended questions. Priority themes were defined as **those that had ≥ 4 responses**. Survey two used a 7-point Likert ranking of these themes to generate a departmental audit and research prioritisation list.

Results

72/89 (82%) available senior staff responded to survey one and 63/83 (76%) responded to survey two. Survey one yielded 208 audit and 130 research topics.

Survey two established a prioritised list of 17 audit and 14 research topics. Top audit themes were mental health care, patient flow, management of sepsis and delays in ED specialist referrals. Top research priorities were the management of sepsis, mental health care, management of patients with autism and the management of severe asthma.

Conclusions

This Delphi study has provided departmental audit and research priorities **that** are perceived to be of importance across the multidisciplinary ED team. This methodology allows strategic allocation of limited resources and may increase staff engagement.

Key words

Audit, Delphi, emergency department, research and survey.

Introduction

Audit and research processes are critical to improving care and furthering the knowledge base of the physicians and other multidisciplinary staff who practice in emergency medicine and paediatric emergency medicine (PEM). Audit has been defined¹ as ***“systematic review of elements of clinical care against predetermined criteria, with the aim of identifying areas for improvement and then developing, implementing and evaluating strategies intended to achieve that improvement.”***

The National Health and Medical Research Council (NHMRC) defines research as a body of work which ***“includes at least investigation undertaken to gain knowledge and understanding or to train researchers.”***²

Both processes are important and can lead to improvements in patient safety and clinical care. They also can produce hypothesis generating insights, contributing to increased knowledge, improved patient care and further research. The terms audit and research may overlap to a degree. There are key similarities between them including methodologies, design, answering important or relevant questions and systematic data collection. Furthermore they may work as a continuum of each other; what may begin as an audit evaluation may evolve into research. However many differences exist also. The primary focus of an audit is quality assurance, benchmarking a current practice against an ideal standard and safe guarding high

standards of clinical care.³ The primary focus of a research project is the generation of new knowledge and/or testing of hypotheses. This type of work is particularly relevant when there is unclear evidence on a topic or the evidence is limited.

In some jurisdictions students, doctors and doctors-in-training are expected or required to complete audits to maintain their professional competence and training requirements.^{3,4} Furthermore completing an audit is now considered one of the pillars of clinical governance⁵ and a 2012 Cochrane systematic review indicated an overall positive effect of completing audits on daily clinical practice.⁶

Inclusion of health care staff in the development of audit and research questions and priorities is important. A study in 2009 estimated that 85% of medical research was inefficient or wasteful with one of the main areas of deficiency being whether the research question was relevant for patients or clinicians.⁷ A national list of research priorities in PEM in Australia and New Zealand has been developed previously⁸ but nursing and allied health members of staff **were not consulted**. Developing a list of audit and research priorities within an emergency department (ED) would create priorities important to the local treating clinicians and better guide departmental efficiencies in designing and completing projects.

Undertaking audit and research in the emergency department (ED) has challenges. Within PEM specifically, these include low rates of serious emergency presentations resulting in difficult attainment of necessary study numbers, additional obstacles with ethics approval and consent in emergency cases, difficult procurement of samples in children and variability in departmental practices and experience across different types of EDs who see children.

Audit and research in EDs is often conducted with limited resources and funding and frequently by time-poor clinicians or other ED staff. This can be managed by developing a strong interested team of individuals, structuring audit and research designs, identifying realistic goals and ensuring the work meets the local departmental needs and goals. Australian paediatricians and paediatric emergency physicians are interested in research and developing research priorities nationally.^{8,9}

The primary aim of this study was to identify and prioritise the departmental audit and research questions of a multidisciplinary team at a large urban ED.

Methods

The study was conducted in The Royal Children's Hospital (RCH) in Melbourne, Australia, a large tertiary PED with an annual census of 90,000 children. RCH is the sole statewide-designated paediatric trauma centre in Victoria. It has approximately

80 medical staff at all levels, 150 nurses and 6 social workers. We conducted a two stage modified Delphi survey of audit and **priorities that are perceived by** all senior medical, nursing and education staff and social workers in the ED. The audit was approved by the ethics committee at Royal Children's Hospital (approval number HREC/18/RCHM/116). Our methodology was modelled on similar surveys conducted by national and international research networks including Paediatric Research in Emergency Departments International Collaborative (PREDICT)⁸, Paediatric Emergency Research in the UK and Ireland (PERUKI)¹⁰ and the Australian Paediatric Research Network (APRN)⁹. A Delphi study is a multistage process, which mediates and collates group consensus on chosen topics.¹¹ It has been widely used as an accepted research methodology in other clinical prioritisation studies. Senior departmental staff was defined as the following staff groups regardless of part-time or full-time status: fellows and consultants, nurse unit manager, associate unit managers, clinical nurse specialists, clinical nurse educators, nurse practitioners (candidates and endorsed) and social work team. An initial pilot survey was developed and piloted across all craft groups and amended accordingly. This formed the basis for the first survey of audit and research ideas.

Stage 1: The first, paper based, survey was anonymous and extracted demographic data including craft group, years of experience as a clinician, years of experience in RCH ED and current academic appointment. In survey one participants were invited

to list up to 5 audit topics and 5 research questions of any format and topic and not strictly in the PICO format. The survey had open-ended questions to allow suggestion of ideas. The following question was posed to all participants: *'Thinking about your practice, what are the most important audit topics we should audit in the department? (List up to 5 topics; ideally try to be as specific as possible)'*. The same question was posed to participants about potential research topics. These ideas were then collated and grouped into broad categories. **Those that had ≥ 4 responses** were put forward for review by senior staff in survey two. Where necessary, the research group reworded the questions into more applicable audit and research terms prior to survey two being distributed.

Stage 2: Survey two was web-based (SurveyMonkey Inc. San Mateo, California, USA. www.surveymonkey.com). Participants were asked to prioritise in order of importance the list of audit and research priorities identified from survey one. The following question was asked: *'Thinking about your clinical practice, how important are the following questions to you in terms of need for future audit or future research?'*. A 7-point Likert scale of prioritisation was used with points of reference including: not a priority, low priority, somewhat priority, neutral, moderate priority, high priority and essential priority used. Likert scores were merged for analysis with a mean score calculated for each question. Based on the mean scores we then prioritised the topics for audit and research.

In both surveys staff were excluded if on leave during the study period and an option was given to identify themselves if interested in conducting specific audit/research once the study was completed. Two weekly reminders were sent via email and staffs were verbally reminded at senior staff meetings. Consent was implied when the participant responded to the survey.

Results

Survey one opened on March 28th 2018 and closed on April 18th 2018. Survey two opened on June 5th 2018 and closed on July 31st 2018. There was an 82% response rate to survey 1 and 76% response rate to survey 2 (Figure 1). All craft groups within the department were represented in the responses to survey one including consultants (20), fellows/senior registrars (10), associate nurse unit managers (10), education team members (5), clinical nurse specialists (10), nurse practitioners (6) and social workers (5). Six respondents did not identify their craft group. The participants had a mean of 15.6 years experience as a clinician (Table 1). Eighteen participants (20%) currently held an academic role.

Survey one.

A total of 208 audit topics and 130 research topics were generated from survey one. This was a mean of 2.8 and 1.8 audit and research questions respectively per person. All participants submitted at least one question. Forty-five audit topics **and 23**

research topics were duplicated in responses. **Therefore 17 audit questions and 14 research questions that had received ≥ 4 responses were identified.**

Survey two.

Mean scores for the 17 audit questions ranged from 4.1 to 5.9 (rated 1-7) and mean scores for the 14 research questions ranged from 4.4 to 5.5 (rated 1-7). See table 2. The top ranked audit questions from survey two included the current management issues and flow processes in the care of mental health patients, the effect a front of house team is having on ED management and flow, management of sepsis in the ED and factors affecting specialist review in the department. The top ranked research questions included care of patients with autism spectrum disorder, intravenous treatments for patients with severe asthma, fluid resuscitation in patients with sepsis, training of staff in the management of mental health patients and **factors that contribute to patients/carers seeking ED treatment .**

Discussion

We undertook a systematic process to assess audit and research priorities in a large urban ED. The audit and research priorities **thathave emergedare** indicative of the issues affecting ED staff, the diseases presenting to a paediatric ED, or where evidence is perceived to be missing or limited. To avoid the bias of an audit and

research agenda driven by departmental leadership or academics we invited all multidisciplinary senior staff – including senior nurses, educators, nurse practitioners, social workers, consultants and fellows – and aimed to determine both an audit and research agenda most relevant for local ED staff.

There were a number of topics identified that were viewed as equally important amongst respondents. Top audit topics were mental health care (delays, management), improvements in patient flow, management of sepsis and delays in ED specialist referrals. Top research priorities were the management of sepsis, mental health care, management of patients with autism and management of severe asthma. There are some similarities in the research topic findings between this study and that from the PREDICT and PERUKI networks.^{8, 10} Topics which appeared in both lists included resuscitation, severe asthma and sepsis management, diagnostic ultrasound use in the ED and factors driving attendance for care at an ED. Most notably no mental health topics featured on the PREDICT or PERUKI lists and yet they feature prominently in the top 5 for both audit and research priorities in our study. The PREDICT and PERUKI studies surveyed senior medical staff only. Our study included all senior medical and nursing staff and allied health team members. ED mental health presentations are increasing in frequency, acuity and resource utilisation year on year¹² and are obviously perceived as an important issue locally to all members of the team. There is no similar data to compare our audit findings to.

The top five audit priorities from this study are now targets of quality assurance processes within the department and the top 5 research priorities have had relevant research projects initiated.

A national study in Australia and New Zealand to determine research priorities across the PREDICT research network was recently undertaken.⁸ While useful to set a national research agenda, it was limited to senior medical staff and exclusively focused on new evidence generation. The PREDICT study deliberately excluded topics where the authors thought evidence already existed (48% of all research topics suggested in the initial survey). In this Delphi study we deliberately did not exclude any topics from prioritisation; if evidence exists, it will need to be promulgated to ED staff through staff education and guideline updates. If no evidence exists, or existing evidence is perceived as not applicable in the local setting, then this evidence should be generated. The findings of our study are broader than previous studies due to both the inclusion of the MDT and the incorporation of audit as well as research topics. Our study found there was not much variability in terms of the mean importance of each audit and research question. The ED staff collectively viewed a wide range of topics as equally important and perceived knowledge gaps in multiple areas relevant to clinical care.

This methodology could be repeated in other departments. It was relatively easy and quick to undertake. Additional free text comments were generated within each survey. These comments will be beneficial in providing context for priority topics, identify interested staff, determine if initial work has already been done or is considered by ED staff, inform about existing evidence or giving recommendations for future work. Our response rate for both surveys was much higher than previous similar Delphi studies^{8, 9, 10} indicating departmental staff buy-in and enthusiasm for inclusion in such a project.

The broad topics prioritised in our study represent the varied backgrounds of the participants. This study allows the setting of a deliberate audit and research agenda for the department, **maximising** the use of limited resources and funding, **helping** to minimise duplication of work and **providing** a list of topics for junior staff to participate in and be supported. To our knowledge a departmental survey such as this has not been described in the ED literature.

Limitations

This study took place in one regional tertiary PED only. However we believe that the findings of this study may be relevant for other paediatric EDs in Australia and New Zealand. We did not include patients and carers. One UK based study included clinicians, patients and caregivers in their prioritisation study.¹³ Their wide list of

prioritised research ideas is not that different to our findings. Another Delphi study by Furyk et al¹⁴, examining consensus research priorities for patients with status epilepticus (SE), also included health consumers in their participant cohort. They also identified 9 research questions, which were shared between the health experts and the health consumers in the treatment of SE perhaps suggesting that there may be considerable similarities between clinician and health consumer priorities. We deliberately kept the initial and follow up survey enquiries broad and not disease specific.

Conclusions

This Delphi study has provided audit and research priorities which are of departmental importance across the multidisciplinary ED team. This methodology has the potential to identify longer-term departmental audit and research priorities, increase staff buy-in by focusing on topics perceived as important, and provide a prioritised list of audit and research topics for ED staff which in turn has the potential to improve the quality and quantity of audit and research produced by our department.

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Tables

Table 1. Participant's clinical and emergency experience

	Total (years)	Range (years)	Mean (years)
Years as a clinician	1042	4-45	15.6
Years in emergency	766	1.5-29	11.1
Years in RCH	552	0-23	7.9

Table 2. Audit and research questions in order of priority.

	Audit Questions	Mean scores	Standard Deviation
1	What is the average length of stay in ED ⁺ for patients with mental health issues? What are the identified reasons for delayed review / discharge?	5.97	1.07
2	What is the current management of patients presenting with mental health issues? (Patient flow, referral, disposition, follow up)	5.81	1.18
3	What is the impact of RAPID (front of house team) on ED ⁺ flow, investigation and management?	5.60	1.04
4	What is the current management of sepsis in ED ⁺ ? (Frequency of patients with sepsis, number of patients with sepsis who receive a sepsis workup / antibiotics / fluids / inotropes, time from presentation to sepsis treatment)	5.43	1.07
5	ED ⁺ Specialist referrals - what is the length of time between referral and review? What are the reasons behind delays in review?	5.13	1.29
6	Flow of admitted patients - what is the length of time from bed request to patient discharged from ED ⁺ ? What are the factors that determine length of stay of admitted patients in ED ⁺ ?	5.00	1.37
7	What are the current pain management practices in ED ⁺ ? (Type and dose of analgesia prescribed for different presenting complaints, time from presentation to administration of analgesia)	4.95	1.35
8	What is the success rate for gaining intravenous access in ED ⁺ ? What is the time to gaining intravenous access in ED ⁺ ?	4.74	1.13
9	What is the incidence of adverse outcomes in patients with fractures who are referred to fracture clinic?	4.73	1.37
10	ED ⁺ short stay unit - what is the rate of failed admissions? How many patients have an appropriate criteria led discharge completed?	4.71	1.13
11	What is the re-presentation rate following use of low-dose dexamethasone to treat mild-moderate severity croup (not requiring adrenaline)?	4.68	1.31
12	What is the frequency and type of adverse events in children undergoing procedural sedation in ED ⁺ ?	4.66	1.29
13	Dexamethasone dose in children presenting to ED ⁺ with croup symptoms - what is the variance in dosing? What factors contribute to this variance?	4.62	1.42

14	What is the current pre-arrival trauma team management? (Role allocation, team preparation, pre-ordering of investigations and imaging)	4.43	1.20
15	POCUS [‡] use in ED [†] - what is the current frequency of POCUS [‡] use? What is POCUS [‡] currently used for?	4.43	1.20
16	CRP [§] use in ED [†] - what is the frequency of ordering a CRP [§] in ED [†] ? Is there a correlation with certain clinical presentations?	4.22	1.40
17	CT [¶] brain in head injured patients in ED [†] - CT [¶] brain rate for these patients - time from presentation to CT [¶] brain.	4.19	1.30
Research Questions			
1	What volume of fluid resuscitation prior to initiating inotropes is associated with the best patient outcome?	5.54	1.06
2	Does training in the management of mental health emergencies translate to better patient care?	5.43	1.13
3	What is the best way to care for, support and treat patients with autism spectrum disorder in the ED [†] ? What are the challenges?	5.41	1.17
4	What intravenous therapies for severe asthma are associated with improved patient outcomes?	5.33	1.45
5	What factors contribute to patient's / carer's decision to seek medical attention in an ED [†] ?	5.32	1.19
6	How can staff wellbeing be measured / improved?	5.13	1.33
7	Is simulation associated with improvement in patient-centred outcomes?	5.05	1.22
8	Does the use of ultrasound for peripheral intravenous access increase success rates?	5.03	1.08
9	Does the use of ultrasound in shocked patients result in changes to clinical management?	4.70	1.24
10	Is the use of ultrasound during fracture reduction associated with reduced rates of re-manipulation?	4.67	1.19
11	Is the use of ultrasound to guide femoral nerve blocks associated with reduced complications / better analgesia?	4.66	1.21
12	Is the use of a back slab to treat toddler's fractures associated with pain reduction?	4.63	1.37
13	What dose of dexamethasone (oral or intramuscular) is associated with better patient outcomes in the management of croup in ED [†] ?	4.60	1.14
14	What measures can be put in place to increase parental / carer confidence and satisfaction with care in the ED [†] ?	4.44	1.30

[†]ED = emergency department; [‡]POCUS = point of care ultrasound; [§]CRP = c-reactive protein; [¶]CT = computed tomography

Figures

Figure 1. Delphi survey response rates.

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