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Our cover photo this issue features National Ambulance Service personnel at the 1916 centenary celebrations. Photo courtesy Kieran Minihane, IJP Photographer.

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We deposit a copy of all Irish healthcare related articles with Lenus, and eDeposit Ireland. The IJP is also indexed and listed with WorldCat, Google Scholar, Directory of Open Access Journals, and ScienceOpen.

EDITORIAL

INTRODUCTION TO U.S. EMS AGENDA 2050

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Introduction

Upon reflection over my past few years, thinking about the future is truly a unique experience. It allows for one to wander within the limits of your own creativity. It also potentially allows the stresses and fear of uncertainty to fester and experience the uncomfortable feelings of leaving what is known today. Ironically, the issues and conflicts we are experiencing today are somewhat comforting. Within the potentials of thinking about the future, is a real opportunity for a dialogue to envision a future and forming the guide to get there. This is essentially what a U.S. EMS Technical Expert Panel (TEP) of ten have done over the past two years. This letter is to introduce an overview of EMS Agenda 2050 as a spark for a global audience to reflect, think about their future of EMS, and engage in their own dialogue.

In short, EMS Agenda 2050 is a guiding document for U. S. EMS, which was federally funded and supported. It follows the original 1996 federal document Emergency Medical Services for the Future, which was tasked with crafting a vision for U.S. EMS. Generally speaking, the Agenda 2050 process had two goals beyond articulating a vision. It was to be heavily influenced by the EMS profession and was to be a unifying document. Two strawman documents were used to spark thought, reaction, and feedback. Four in-person regional meetings were held utilizing a world café format with probing questions to facilitate dialogue and capture input. Smaller sessions were held at national and state conferences. Digital initiatives were launched with the assistance from national EMS organizations to submit feedback. National EMS organizations also designated liaisons to engage in the Agenda 2050 process. Captured feedback was continuously reviewed by the TEP throughout the process.

EMS Agenda 2050 formed around a central value of being people centered. The word people was intentionally used with a broad and inclusive context in mind. This allowed for the document to be formed around a vision that was not limited to being patient, provider, or community centered. The value helped to form six guiding principles: Inherently Safe and Effective, Integrated and Seamless, Reliable and Prepared, Socially Equitable, Sustained and Efficient, and Adaptive and Innovative. The principles were not presented in a particular order of importance. All of the guiding principles formed with a people centered mindset and were rooted in feedback and professional passion.

Inherently safe and effective focused on all systems of EMS embracing a culture of safety with practices that reduce harm and yield good outcomes. All of which support meaningful technology and policies that reduce safety risks in EMS. Integrated and seamless described strengthening the bridge between EMS and healthcare services and systems beyond just the local ER. Included, a more collaborative system of medical oversight and network of resources, professionals, and partners in public safety to deliver care and preparedness. Reliable and prepared in EMS set a vision for adequately staffed by a compensated workforce that is holistically well cared for. Another component articulated a need to reduce variability amongst EMS systems, shifts, and communities in order to provide more consistent evidenced based care.

The socially equitable principle advocated how the setting where an individual receives care ought to have a minimal impact on the quality of care provided and their outcomes. All demographics and patient profiles ought to receive consistent high-quality care. Sustainable and efficient defined EMS as an essential service with allocated resources based on needs, system design, and improving patient outcomes. Adaptable

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and innovative embraced fostering environments for innovation, creativity, and sharing successes. This could include delivery of EMS, patient outcomes, and research. Throughout the principles are statements supporting the importance of academics, leadership, and culture.

As I begin to conclude this letter, I concede how some of the EMS Agenda 2050 did not seem farfetched and may even read as common sense. With that concession comes a challenge for all of us. Why is it that something that seems to just make sense going to be such a challenge? The original 96 EMS Agenda set fourth goals that seemed easily obtainable and still do. However, not all were achieved to date just as not all of EMS Agenda 2050 will likely come to fruition. Achieving the value and principles within EMS Agenda 2050 is going to take hard work, collaboration, and true visionary leadership to steward past the status quo and beyond the adversarial positions of today.

More information about EMS Agenda 2050 can be found at emsagenda2050.org.

COMMENTARY

HELICOPTER EMS IN CORK: A PARAMEDICINE PERSPECTIVE

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Disclosures: SK is also an Assistant Chief Ambulance Officer with the National Ambulance Service, a member of PHECC and Chair of the Education and Standards Committee within PHECC. Views do not represent any of these or any other organisation. The opinions shared are that of the author representing the Executive of the ICoP. The author's opinion is not in any way related to his employment, employer or any associated membership of committees or any organisation other than the Irish College of Paramedics.

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None

Abstract

Introduction

The intent of this commentary is to provide a paramedicine perspective on the new helicopter EMS service in the Southern region of Ireland, covering mainly Cork and Kerry. The recent discussions regarding the crew composition of the proposed Helicopter Emergency Medical Services (HEMS) in Cork require comment from paramedicine. Whilst we respect the opinion of other professions we feel it is important to provide an Irish perspective on behalf of members of the Irish College of Paramedics - Emergency Medical Technicians (EMTs) Paramedics, and Advanced Paramedics (APs).

Keywords: paramedicine, HEMS, helicopter, flight paramedic

The recent discussions regarding the crew composition of the proposed Helicopter Emergency Medical Services (HEMS) in Cork require comment from paramedicine. Whilst we respect the opinion of other professions we feel it is important to provide an Irish perspective on behalf of members of the Irish College of Paramedics - Emergency Medical Technicians (EMTs) Paramedics, and Advanced Paramedics (APs).

Regulation and Education

In Ireland, as with most other developed countries, the provision of pre-hospital care has improved significantly, particularly over the last two decades. The establishment of regulatory bodies (1-3) to provide governance and oversight for pre-hospital providers has been an important step in improving the level of pre-hospital care. Our regulator, the Pre-Hospital Emergency Care Council (PHECC) has introduced national standards for education for pre-hospital practitioners – EMTs, Paramedics and APs comparable to, or exceeding, the standards of paramedicine in other developed countries. New clinical practice guidelines, education and training standards and multiple drugs/medications have all added to the increasing scope of practice. Paramedic education has been provided in conjunction with universities since 1997, well ahead of other jurisdictions and programmes continue to be provided in collaboration with Schools of Medicine at University College Cork, University of Limerick, Royal College of Surgeons Ireland, and University College Dublin. These standards are governed by PHECC and the graduate is then registered and licensed to practice in Ireland, unlike many other healthcare professions and unlike many other jurisdictions where no national registration or regulation occurs.

Crewing Models

There are varying models of pre-hospital care ranging from paramedic provision of care through the mix of First Aid (4) Basic Life Support (BLS), immediate care, Advanced Life Support (ALS) and the many associated specialist paramedicine grades. This model of paramedic care is typically associated with established systems of pre-hospital care in countries with recognised professional bodies, with or without an associated regulator including Canada, USA, New Zealand, South Africa, Australia, United Kingdom, and Ireland. Depending where you are in the world an ambulance is staffed by varying numbers and differing practitioner qualifications. Discussions on the various types of paramedic/EMS practitioners continues to try to determine which combination of grade provides the most appropriate level of care: ALS (5-7), BLS (8), or a mixed model of crewing?

Countries such as France, Germany, Austria and Malta have physicians who respond to calls in ambulances and response vehicles. In Sweden and the Netherlands, ambulances are staffed by nurses and paramedics. Yet, in Ireland we have not selected this ‘Franco-German’ model of ambulance response and we have moved away significantly from the nurse deployment model.

Comparison

Similarly comparison to Australia where helicopters (HEMS) are staffed by doctors is an ‘oranges and apples’ comparison. Ambulance Victoria have Mobile Intensive Care Paramedics (MICA) and Air Ambulance Paramedics who work on aircraft. There are over 6 million people living in an area of more than 227,000 square kilometres. In 2015-2016, paramedics in Victoria responded to 589,847 emergency calls: that’s one every 55 seconds, and there were an additional 245,944 non-emergency calls. In 2016-2017 Ambulance Victoria responded to 2,128 Helicopter emergency calls.(9) Ambulance Victoria has 4 HEMS and one HEMS Retrieval helicopter. Most Victorian trauma occurs in metropolitan Melbourne but there is a higher per capita incidence of trauma in rural areas. This is related to increased travel distances, greater exposure to roads of lower standard and longer journeys at high speed. The incidence of trauma is most prevalent in rural areas due to increased travel distances and poor road conditions.(10) Victoria is the second largest state in Australia with a population of 6.3 million. Cork, however, has a population of 542,00 and Kerry a population of 147,000.

Flight paramedics are also used internationally - the USA, Canada, South Africa and Australia all utilise paramedics with additional training to allow them to function in

either helicopters or fixed-wing aircraft as part of a HEMS team, generally without physicians.

Ireland

Ireland currently has an aeromedical unit based in Athlone. It was established in 2012, is operated by the Air Corps and is staffed by a Defence Forces Emergency Medical Technician and an Advanced Paramedic from the National Ambulance Service. This unit has responded to over 2,500 calls since it was established, with the majority of its calls related to medical emergencies, not trauma. In addition we also have access to four strategically situated Irish Coastguard helicopters staffed by PHECC Registered Paramedics. In total, we have access to six helicopters and an additional HEMS resource in Northern Ireland.

Evidence

We appreciate the discussions and comments from our colleagues in Emergency Medicine, the medical specialty which has assisted us most in developing into the profession we are today, but we would ask you to consider the context and evidence to support a particular HEMS crewing model. Most emergency calls in Ireland are not related to trauma where indeed a physician could make the greater impact

We have been served well over the last 6 years with the EMT/AP model of HEMS provided by the Air Corps and the National Ambulance Service and there has been no identified need to change this model or evidence to suggest it is not working. We cannot compare HEMS in an Australian state with a population approximately ten times the size of the Cork/Kerry region and an area about the same size as Britain. Paramedics, Emergency Medical Technicians and Advanced Paramedics are all registered by the Pre-Hospital Emergency Care Council and work collaboratively on-the-road and are accustomed to providing care in the pre-hospital environment. Additional skills, relevant to working in a helicopter will be added to the skill set of the selected EMTs/APs

Crew composition

We believe that the current proposed crew composition of a PHECC Registered, National Ambulance Service Emergency Medical Technician and Advanced Paramedic should be utilised for the new HEMS asset in Cork/Kerry. All data relating to calls (type, management, interventions, receiving facility etc.) should be reviewed at a timely juncture to inform any future potential adjustments to crew composition. We are also of the opinion that PHECC should consider a specific 'Flight Paramedic' programme based on international best-practice and certified by the Regulator to provide a national standard for HEMS paramedicine practitioner – paramedic, EMT and AP.

The discipline of paramedicine is growing and evolving. In years to come paramedics should be involved in more areas of care and not limited to emergency pre-hospital care. International models of paramedicine include paramedics working in emergency departments, General Practitioner surgeries, in the communities, oil rigs, mining facilities, aircrafts, inter-hospital critical transfers etc.

I personally work with EMTs, paramedics and APs on a regular basis from all services and I have had the opportunity to work with colleagues in other countries. Ireland has a high standard of practitioner comparable to any 'best-practice' international model. I have worked with the staff of HEMS 112 on many occasions and I am always impressed with the level of care all practitioners provide. If practitioners are tasked to different assets and require additional skills, then those additional skills, equipment and medications should be provided to allow them to perform optimally in the HEMS environment.

Finally, we believe the crew of EMT and AP on the HEMS unit in Cork will meet the requirements of patients we serve in the Southern area and that all evidence on this should be reviewed after a period of operation to determine if a different model is required. I personally would be very content to see an experienced Advanced Paramedic and Emergency Medical Technician from HEMS coming towards me at a scene, as either a colleague or indeed a patient. Whilst we may be considered by some as the 'Toyota' and not the 'Rolls Royce' I would like to think we are part of the Toyota family aspiring to be a Lexus, remembering too that Toyota is 'the best built car in the world'!

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COMMENTARY

ROTE LEARNING: THE UGLY DUCKLING OF STUDENT PARAMEDIC EDUCATION?

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Abstract

Introduction

The intent of this commentary is to ask questions and stimulate discussion amongst academics and paramedic educators as to whether the inherent value of rote learning has simply been lost in the shadow of more recent learning and teaching practices.

Keywords: paramedicine, higher education, rote learning

The vocational training of paramedics prior to the mid-1990s in Australia can possibly be characterised as draconian. Stories of preceptors wielding baseball bats in the middle of the night demanding that hapless paramedic students recite treatment protocols verbatim are hopefully apocryphal. Paramedics were required to learn protocols and pharmacology by rote under pressure with the pedagogical view that they could call on this information quickly in a life and death crisis. Thus, rote learning may have been associated with intimidation and trepidation. Nevertheless, the learning philosophy underpinning rote learning for the student paramedic, whereby the student completes a task repetitiously or memorises textual information, receives little attention in the education literature. With the advent of transformative changes in higher education towards the delivery of flexible, innovative and engaging learning experiences (1), rote learning barely raises a whisper. Has rote learning become the ugly duckling of student paramedic education?

The literary discourse surrounding rote learning is infused with negative undertones. Rote learning is often assumed as superficial learning (2,3), and a transitional way-point towards critical thinking and meaningful learning (4). Arguably, paramedicine has adopted a similar learning trajectory to cognate disciplines. For instance, the seminal works of Benner guided by the Dreyfus model of skill acquisition (5) argue that the novice nursing student operates within a closed framework of rules and guidelines accentuated by rote learning. Borrowing from Aristotle, Benner in later works argued that clinical practice is an amalgam of *techné* (standardisation of practice) and *phronesis* (situated actions based on skill, judgement, wisdom and character)(5). For example, while some clinical skills are relatively simple to execute, such as the taking of vital signs, good clinical judgement relies on deeper, experiential learning to interpret trends in the vital signs that may signal significant changes in a patient's condition. Similarly, learning ECGs may begin with memorising basic patterns of various rhythms from which the more complex skills of interpretation are built. It is generally accepted that the underpinning pedagogy of the higher education approach is better suited to paramedic education than the post-employment (vocational) model in developing students with critical appraisal, problem-solving and life-long learning skills (6). However, in our inexorable march towards professionalism, has the singular value of rote learning been lost to the annals of history?

Similar to nursing, paramedicine is a practical, skills-based profession requiring technical expertise in the day-to-day work of a paramedic. The scope of practice of a paramedic may include dozens of clinical procedures, some of which are relatively common, e.g., pulse oximetry and blood glucose analysis, whereas other critical procedures such as defibrillation are utilised infrequently (7). Developing automaticity through rote learning has notable advantages for student paramedics. Rote learning may ensure a solid grounding for the foundational skills of paramedic practice before the scaffolding of more complex higher reasoning skills are added. Additionally, while it is well accepted that clinical practice guidelines (CPGs) should not be applied mechanistically, rote learning may act as a clinical safety net because it provides an algorithm of clinical management in response to certain patient presentations, such as cardiac arrest. Memorisation of compression and ventilation rates, drug doses and defibrillator settings may improve skill reliability in stressful situations, particularly with infrequently used skills or when the clinician is fatigued.

Rote learning through repetition and memorisation needs not be seen as anathema to contemporary higher education pedagogies. Certainly, this commentary is not arguing for the reinstatement of rote learning as the primary learning tool for student paramedics. Rather, the intent is to ask questions and stimulate discussion amongst academics and paramedic educators as to whether the inherent value of rote learning has simply been lost in the shadow of more recent learning and teaching practices. Continuing the Hans Christian Andersen's ugly duckling analogy, perhaps it is time for rote learning to re-emerge as a valued subsidiary of paramedic education.

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LETTER TO THE EDITOR

RE: HELICOPTER EMS IN CORK: A PARAMEDICINE PERSPECTIVE

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Dear Editor,

I read Dr. Shane Knox's commentary "Helicopter EMS in Cork" (1) in the current edition of the Journal with interest.

Firstly, to be clear, I have the utmost respect for paramedics. The commencement of an EMS helicopter in Cork is a landmark step forward in prehospital care. The 'Toyota' reference made in the Knox article is in relation to a misquote published in the Irish Times from a recent RTE Radio interview I gave around the staffing model of a Helicopter EMS (HEMS). The reference I made to Toyota was in fact with respect to the physician-paramedic HEMS model that is the norm in Australia, Northern Ireland, Scotland, England, Wales and mainland Europe. I don't view a physician-paramedic team as a Rolls-Royce, platinum or gold standard model, but rather more like a Toyota; attainable and highly durable. In August 2015, the College of Paramedics (UK) stated "*The College of Paramedics support proposals for a HEMS service in Northern Ireland, with a view that this service should be integrated within a trauma network in Northern Ireland and consist of a specialist pre-hospital Doctor and Paramedic team.*" (2) The HEMS in Northern Ireland is now staffed with this model by the Northern Ireland Ambulance Service (NIAS).

The Irish government recently endorsed the development of a Trauma System for Ireland. Inherent to any trauma system is enhanced prehospital trauma care capability. Albeit the air ambulance will certainly bring speed, it will not bring enhanced skills without a doctor-paramedic team that will save additional lives, nor will it meet the PHECC dispatch standards for emergency calls by road (dual paramedic). The doctor-paramedic model can provide advanced prehospital critical interventions such as balanced emergency anaesthesia, mechanical ventilation, finger thoracostomy, blood transfusion and eye, life and limb-saving procedures (e.g. lateral canthotomy, resuscitative thoracotomy) as well as enhanced system activation such as prehospital massive transfusion activation and bringing a patient direct to theatre from helipad (code crimson).

Recently, Mark Winter, an operations manager of Wales Air Ambulance (doctor-paramedic EMRTS team) said: "*One of the things we talk about in our world is 'unexpected survivors'-those patients who have had emergency front line treatment at the roadside or at the home who otherwise would have to be taken to the hospital, where it might have been too late.*" (3) The similar EMRS in Scotland is increasing coverage as I write this to meet the demands of the newly developed Scottish Trauma Network. I'm sure the patient needs are the same in Ireland as they are in Northern Ireland or Great Britain.

A doctor-paramedic team extends critical care to life-threatening prehospital and medical emergencies such as STEMI with cardiogenic shock requiring safe intubation

and ventilation, central inotropic support or controlled mechanical ventilation and targeted BP control in neurological emergencies (e.g. subarachnoid haemorrhage, stroke with coma). This team responds rapidly to prehospital or hospital tasking and can provide intensive care level stabilisation and support anywhere.

Certainly as Knox points out many of the interventions/skills that can be brought to the scene can also be performed by critical care paramedics (e.g. MICA in Victoria). This expertise does not occur overnight and takes years to develop. In my opinion, in Ireland a critical care paramedic model can only develop in the environment of a physician-paramedic team in terms of training, curriculum development and governance. There are excellent Irish advanced paramedics and prehospital specialist doctors in Ireland and abroad who together would make an excellent team that would serve the community and patient needs to the highest level. Now is the time.

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RESEARCH ARTICLE

INTERNATIONAL EXAMINATION AND SYNTHESIS OF THE PRIMARY AND SECONDARY SURVEYS IN PARAMEDICINE

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Abstract
Introduction

Paramedics routinely rely upon two assessment and treatment algorithms, known as the primary survey and the secondary survey to guide their care. Despite their ubiquity, there is no international consensus for the assessments and interventions that are included in, or omitted from, these algorithms.

Methods

A Delphi process evaluated Australasian paramedic clinical practice guidelines alongside six other international paramedic CPGs from the United States of America, Ireland, United Kingdom, South Africa, Qatar, and the United Arab Emirates in order to identify current assessments and interventions, described in best-practice recommendations for paramedics. The panellists also contributed concepts that they felt were important additions based on their experience as experienced paramedics and paramedic educators.

Results

The resulting amalgamation of concepts identified in each term was then formed into two mnemonics, which sequentially list approximately 100 specific clinical concepts that paramedics routinely consider in their care of patients. We describe these as the “International Paramedic Primary and Secondary Surveys”.

Conclusion

The primary and secondary surveys presented in this paper represent an evidence-based guide to best practice in conducting a primary and secondary survey in the context of paramedicine. Findings will be of use to paramedics, paramedic students, and other clinicians working within this diverse clinical field.

Keywords: Paramedic, International, Primary Survey, Secondary Survey, Clinical Practice Guideline

Introduction

Internationally, paramedics confront the challenge of rapidly identifying, approaching, assessing, treating and transporting or referring patients in a variety of clinical situations. Patient conditions range from low acuity to the imminently life threatening, in circumstances that can range from unremarkable to extremely challenging and dangerous. In order to practice in a consistently organised and comprehensive manner, paramedics rely upon performance algorithms, often documented in clinical practice guidelines (CPGs). Frequently these CPGs recommend that paramedics conduct two algorithmically sequential approaches respectively entitled the 'primary survey' and the 'secondary survey'. Whilst paramedicine adopted these terms from the practice of medicine, their application in CPGs is inconsistent.

The 2013 iteration of the St John Ambulance, Northern Territories (Australia) CPGs (1) contains a concise and comprehensive description of what a primary and secondary survey should be. They state "The primary survey is a rapid procedure designed to identify life-threatening conditions that require immediate intervention" (1, p.238) and "the secondary survey is a comprehensive compilation of clinical signs and symptoms, measured in combination with pertinent medical history, which is the foundation of a detailed patient examination" (1, p.238). They also offer an important general principle to consider with any patient encounter: "patient assessment is not a singular event, but a continuous process that constantly considers and re-evaluates clinical presentations" (1, p.238).

The structure most commonly used by Australasian state ambulance services to format the primary survey is adopted from the Australian and New Zealand Committee on Resuscitation and uses the initialism DRS ABCD to guide the practitioner to sequentially take the following steps (Text box 1)

D	Dangers?
R	Responsive?
S	Send for help
A	Open Airway
B	Normal Breathing?
C	Start CPR
D	Attach Defibrillator (AED)
	Continue CPR until responsiveness or normal breathing returns.

Text box 1 – DRS ABCD. Adapted from the ANZCOR Basic Life Support Flowchart, Jan 2016. (2)

The DRS ABCD initialism aims to guide basic life support providers through an unfamiliar situation. We question whether it is sufficiently comprehensive to cover the full scope of practice of professional paramedics in the delivery of out-of-hospital advanced medical care. For example, there is no mention of assessing the integrity of the cervical spine, or consideration of how to change the approach in a mass casualty incident.

The contents of the secondary survey are more ambiguous and, depending on the author, may include any combination of the following factors:

- A determination of the patients' identity
- An inquiry into the patients past medical history, allergies and current medications
- An interview focused on the current chief complaint or condition,
- A description of the events leading up to the incident
- A full set a vital of signs,
- A head-to-toe assessment

The purpose of this paper is to critically review paramedic service CPGs currently in use in public service ambulance providers in each jurisdiction of Australia and New Zealand,

as well as nationally developed CPGs from the United Kingdom (UK), Republic of Ireland, the USA, South Africa, Qatar, and the United Arab Emirates (UAE). This review was used as a basis for the development of a consensus of meaning of the terms 'primary survey' and 'secondary survey' in the context of out-of-hospital advanced paramedical care.

Methods

This was a review of publicly accessible documents, and thus no ethics approval was required. Where possible, the authors identified the most up to date versions of clinical practice guidelines and skills manuals directly from the internet. Alternatively, where current documents were not accessible, we requested these directly from the organisation via email communication. Only the full versions of the CPGs were used; the panelists did not refer to pocketbooks or other summaries of the CPGs. The CPGs examined were current as of the date indicated for each reference.

For the first phase of the research, the principal investigator (PI) (MAC), identified and sourced the initial list of nationally representative CPGs and developed a draft data tool. The selected CPGs were reviewed against the tool to capture any missed reference points on the primary or secondary survey. After completing the first iteration of the data tool, the PI recruited the first cohort of three panelists for the Delphi process. Additional panelists were recruited through snowballing with the final Delphi panel having five members. The PI included all the panelists in the author group for this paper. For selection, a panelist required specialist knowledge, experience or qualifications with paramedic education and CPG development. The panelists' represented a broad international group, including practicing as clinicians and academic paramedics in: the UK (GE), Republic of Ireland (AB), Australia, South Africa (CC), Canada (MAC, AB), the USA (MRC), and New Zealand (SM). Additionally, CC was the editor of the Qatar CPGs and worked clinically in that context, and AB was involved in the development of the UAE CPGs and treatment protocols.

Panelists were asked to identify additional relevant national CPGs for review. Each panelist independently reviewed their allocated clinical practice guidelines. Allocations related to their country of practice/expertise. CPGs were reviewed for any content that outlined assessment or interventions defined within the terms 'primary survey' or 'secondary survey'. Any concept that was considered part of either the primary or secondary survey was recorded using the quantitative tick-box data tool developed by the PI. Panelists could suggest additions to the tool, based on review of their allocated CPGs. Once all of the CPGs were evaluated and additional concepts had been included, they were ordered and summarised.

Text-box 2 and Text-box 3 list the CPGs and further explanatory documents, such as skills manuals or clinical work instruction manuals which were assessed. We included data from these resources that mentioned initial and subsequent concepts (defined as either assessments or interventions) in the results section of this paper. Notably, Health Professions Council of South Africa (HPCSA) guidelines for Emergency Care Technician, published on the HPCSA website, did not include any specific mention of the primary and secondary survey.

The second phase of the research project involved the facilitation of the Delphi process by the PI to reach consensus on the final inclusions for the International Paramedic Primary and Secondary Surveys (IPPSS). The information from the first phase formed the final list the panel used to develop the IPPSS. The PI facilitated thirteen Delphi iterations, where panelists reviewed the inclusions and ordering of the assessment and interventions relevant to the primary and secondary survey of the IPPSS. During the consultation round, panelists could make recommendations for additional items to be included in the primary and secondary survey based on their professional experience.

Results

The primary and secondary surveys reported in this paper present a combination of over 100 unique assessments and interventions present in the CPGs examined that could be included in a primary and secondary survey. Due to the volume and complexity of this information, the panelists agreed upon a simplified format for remembering and presenting the concepts. Two mnemonics were included to help clinicians remember the

order and contents of each survey, based on previous unpublished work by the PI, which are presented in this paper.

Australian Capital Territory Ambulance Service Guidelines (3)
New South Wales Ambulance 2016 Protocol and Pharmacology (4)
Ambulance Victoria CPG 2016. Edition Version 1.1 (5)
Queensland Ambulance Service Clinical Practice Guidelines (6)
South Australia Ambulance Service Paramedic CPGs, May 2015*
St. John Ambulance Northern Territories CPGs Version 2.3, June 2013 (1)
St John New Zealand CPGs. Comprehensive edition, 2016-2018 (7)
St John Ambulance Western Australia CPGs, Version 24*
Wellington Free CPGs. Comprehensive edition, 2016-2018 (8)
UK Ambulance Services Clinical Practice Guidelines 2016 (9)
PHECC Clinical Practice Guidelines 2017 Edition – Paramedic (10)
USA – National Model EMS Clinical Guidelines, V.2. September 2017 (11)
South Africa – HPCSA Capabilities of Emergency Care Providers CPGs (12)
Qatar – Hamad Medical Corporation Ambulance Service, CPGs 2016*
UAE - Clinical Practice Guidelines and Treatment Protocols (13)

Text box 2 – CPGs evaluated for the development of the International Paramedic Primary and Secondary Surveys. *=direct communication

Australian Capital Territory (3)
Ambulance Service New South Wales Skills Manual*
Ambulance Victoria (5)
Queensland Ambulance Service (6)
St. John Ambulance Northern Territories (1)
St John New Zealand (7)
St John Ambulance Western Australia*
Wellington Free (8)
NREMT Medical, Trauma and Cardiac Arrest Skill Sheets (14)
Qatar – Hamad Medical Corporation Ambulance Service, Skills Manual, 2016*
PHECC Level 5 Paramedic – Primary Skills OSCE Manual Version 4 (15)
PHECC Level 5 Paramedic – Secondary Skills OSCE Manual Version 4 (16)

Text box 3 – Skills Manuals evaluated for the development of the International Paramedic Primary and Secondary Surveys. *=direct communication

The Primary Survey

The primary survey summarises the assessments and interventions used to guide the professional paramedic or other health care professional through the first few minutes of patient contact in any setting. Included are concepts important in: establishing scene safety; developing an overview of the incident and the context in which it occurred; determining whether there are immediate life threats to the patient, which need to be addressed; highlighting early, important decisions which need to be made; and, guiding the paramedic with extrication and transport considerations.

There are three points in the first few moments of contact that refer specifically to ensuring safety. We differentiate between appropriate precautions to prevent infections (the first point of the mnemonic under the title ‘Safety’) and general scene safety (the second point of the mnemonic under the title ‘Fear’) as both are essential and sufficiently different to merit their own mention. The second ‘T’ (for ‘Threats’), point nine of the primary survey mnemonic, occurs after first contact with the patient and stresses the importance of re-ensuring global scene safety before focusing attention on the assessment of the ABCDEs. Although the mnemonic has no further reminder of repeated

Safety	Take universal/standard precautions prn* (gloves, eye protection, helmet, safety gear)
F - Fear	Does anything make you fear that the scene may be unsafe? (obvious or subtle dangers)
I - Incident	Determine the nature of the incident while entering
R - numberR	Determine the number of patients involved while entering
S - Send for help	Send for appropriate help (as required)
T - Trauma or Triage	Consider T rauma to the patient's c-spine prn <OR> Perform T riage in MCI
G - General Impression	Develop an impression of the situation (report to dispatch, prn)
	Patient's approximate age, gender, location/position found, and apparent level of distress/acuity
E - Estimate level of awareness	Determine AVPU (Alert, responding to Verbal, responding to Pain, or Unresponsive)
	Include motor score of the GCS if responding to painful stimulus only
	Determine if oriented to person, place and time (if appropriate)
T - Threats	Assess: for any immediate threats to self, team, patient and bystanders before beginning the ABCDE's
	Consider: 'POPE' (People, Objects, Places, Environment) and control of catastrophic/life-threatening haemorrhage prn
ABCDEs	Use a 'find-it, fix-it, move-forward' approach
A - Airway	Assess:
	Is the airway patent?
	Does it need clearing?
	Are there current, or impending, obstructive difficulties?
	Consider:
	Positioning
	Suctioning
	Foreign Body Airway Obstruction (FBAO) removal (Magill forceps/laryngoscope/back blows/chest thrusts)
	Basic airway adjuncts (oro/nasopharyngeal airways, supraglottic airway device)
	Advanced airway adjuncts (endotracheal intubation +/- pharmacological assistance)
Surgical airway (for the "can't intubate-can't ventilate" patient)	
B - Breathing	Assess:
	Look, listen, feel for breathing and assess respiratory effort
	Consider rapid 4 point auscultation (if appropriate)
	Consider oxygen saturation (SpO2) & end tidal carbon dioxide (EtCO2) measurement (prn)
	Consider:
	Establishing breathing using a bag valve mask
	Oxygen administration (mask, nasal cannula, bag valve mask) for hypoxemia
Chest needle decompression or finger thoracotomy (prn for life threatening tension pneumothorax, or haemo-pneumothorax)	
C - Circulation	Assess:
	If there is a pulse or not
	Pulse rate, strength, and regularity
	Perfusion estimation - adequate vs inadequate
	For uncontrolled external haemorrhaging
	Skin condition (colour, temperature, diaphoresis)
	Consider:
	Direct pressure/tourniquet for uncontrolled haemorrhage
	Cardiopulmonary resuscitation if vital signs absent
	Intravenous initiation
Electrocardiogram determination prn	

continued overleaf...

D - Disability	Assess:
	<i>Medical: "BANG ZAP PUSH"</i>
	Benzodiazepine treatment for prolonged seizures
	Adrenaline (epinephrine) for life threatening bronchospasm (e.g. anaphylaxis, asthma)
	Naloxone for narcotic overdose with inadequate ventilation
	Glucose for hypoglycaemia
	ZAP: Defibrillation or Cardioversion prn
	Push (fluids): IV fluids in suspected hypovolemic hypotension
	<i>Trauma: "badly broken or bleeding"</i>
	Broken bones causing complications (especially the cranium, spine, ribs, pelvis or femurs)
	Internal bleeding or pneumothorax
	Patient acuity - Not sick, Sick, Very sick, or Dead
	Consider:
	Any other treatment required immediately based on presentation so far
E - Extrication	Assess:
	Current environmental conditions (e.g. heat, cold, wind, rain, direct sun, impending danger)
	Egress route to transportation (manual handling considerations, obstacles, dangers)
	Consider:
	Immediate/emergent extrication (e.g. if unsafe scene)
	Expedited extrication (e.g. 'load and go' for time critical patients)
	Protection from potentially adverse environmental conditions if staying on scene
	Requesting additional assistance (e.g. higher level medical assistance, rescue services in cases of entrapment or complex egress, law enforcement, animal control, etc.)
Appropriate transport method (e.g. bariatrics, air transport)	
Appropriate transport destination (e.g. cardiac or trauma bypass, paediatric centre, neuro centre, etc.)	
Note: the ABCDE order of presentation in this part of the primary survey is meant to aid in initial memorization. The experienced clinician will recognize that different cases will require different approaches based on the patient's presentation (e.g. conscious v unconscious, acute v non-acute, trauma v medical, etc.)	
*prn = "pro re nata", or 'as required'. MCI = Multi Casualty Incident.	

Table 1 – The International Paramedic Primary Survey

safety checks, the expectation is this will remain an ongoing, dynamic, and primary consideration. The primary survey we present can be remembered using the mnemonic "*Safety first. Get ABCDEs*". The mnemonic is outlined in Table 1.

The Secondary Survey

The secondary survey outlines assessments and interventions to guide the professional paramedic or other health care professional, through the remaining entirety of the patient encounter, including patient handover to other healthcare professionals when required. Individual items in the physical examination of the patient were not included as these were felt to be context-specific. Determining a 'mandatory' set of physical examinations to be performed (beyond vital signs) was considered to be overly prescriptive and likely too complex. However, this is an area for future review. If individual items of the physical exam are included the list of concepts in the secondary survey would be well over 50, bringing the total combined number of concepts in the primary and secondary survey to well over 100. As aide memoire for the secondary survey we present we chose the mnemonic "*I See I HAD Vitals Assessed and Treated*". The mnemonic is explained in Table 2

This format of the secondary survey has the advantage of that it serves as an outline for a patient handover to another health professional. The first three items ("*ICT*") establishes: patient identity; their presenting complaint or condition; and information about the incident and their current condition. This would be an appropriate handover to deliver, for example, to a triage nurse in an emergency department. The remaining six items ("*H A D Vitals Assessed and Treated*") give a concise overview of the patient's

Identify the patient	Name
	Age/Date of Birth
	Address
	Health Identification number (if applicable)
C (See): Chief Complaint (or Condition)	Open question (e.g. 'what seems to be wrong, or, 'how can I help you?')
	Focused questions (to clarify the presenting complaint or condition)
	Prioritize the assessment of Ischaemic Chest Pain (ICP), Shortness of Breath (SOB), and/or Altered Mental Status (AMS)
	Ask "Anything else"? – be sure to exhaust all aspects of the presenting complaint or condition, e.g. "is there any other pain or discomfort in your head, neck, chest, belly, back, arms or legs"?
Incident History	<i>N:</i> When did the patient last feel 'Normal' (for them)?
	<i>O:</i> Describe the Onset of this situation (time and rate of onset, activity at onset, possible causes)
	<i>P:</i> Which actions are now <i>Provocative</i> or <i>Palliative</i> ?
	<i>Q:</i> What is the <i>Quality</i> of the pain or sensation the patient is feeling?
	<i>R:</i> Is there any <i>Radiation</i> of discomfort? If so, where, and under which conditions?
	<i>S:</i> What is the <i>Severity</i> of the complaint? (0-10, or mild/mod/severe, or visual analogue scale prn)
	<i>T:</i> Is this <i>Typical</i> for the patient? <AND> was there any precipitating Trauma?
	<i>U:</i> Undigested food? When did the patient last eat or drink? What did they eat or drink?
History: Medical and Social	Any existing medical conditions? (Cardiac, Respiratory, Neuro, etc. Any disabilities?)
	Ask "Anything else"? – be sure to exhaust all aspects of the patient's medical history
	Who is their regular medical provider? Alternative health-care providers?
	Problem focused history (e.g. respiratory focused system history/interview for the SOB patient)
	Family history: Adopted? Parents alive/dead – what cause? Any diseases in blood relatives?
	Social history: Gender-at-birth, Education, Occupation, Socioeconomic status, Sexual history, Marital/partner status, Alcohol, Cigarettes, Caffeine, Other drug use, Recent travel (where and when), Previous hospital experiences and preferences.
Allergies	Environmental?
	Chemical?
	Food?
	Ask "Anything else"? – be sure to exhaust all aspects of the patient's allergies
Drugs	Alternative/Complimentary "Remedies"?
	Over the counter medications? (e.g. acetylsalicylic acid, acetaminophen, vitamins)
	Prescription? (be sure to inquire about compliance)
	Illicit drugs?
	Ask "Anything else"? – be sure to exhaust all aspects of the patient's drug usage
Vitals (as appropriate)	Levels of Responsiveness (e.g. Glasgow Coma Scale, AVPU, etc.)
	Level of Pain
	Skin condition (colour, temperature, diaphoresis, turgor)
	Pupil shape, size, equality, response to light and accommodation
	End tidal carbon dioxide (EtCO ₂)
	Temperature (peripheral, and core prn)
	Respiratory rate, depth, effort, and pattern
	Electrocardiogram (ECG)
	Blood pressure
	Pulse rate, rhythm and strength (noting any absent pulses)
	Blood sugar levels (if appropriate)
Oxygen/Haemoglobin saturation (SpO ₂)	

continued overleaf...

Assessed: Physical Assessment	In general trauma a comprehensive head to toe examination
	In isolated trauma a focused examination of the injury
	In medical cases a focused, systems-based examination based on the presenting complaint or condition
(and) Treated: Treatment & Response	What treatment was performed prior to your arrival? Results?
	Development of a treatment plan
	Results of your interventions (with ongoing reassessments of the patient)
	Recommendations for further referral, assessments or treatments that may be appropriate as part of a comprehensive care pathway

Table 2 – The International Paramedic Secondary Survey

status as well as their response to any treatment administered and considerations for future assessment and treatment. This would be appropriate to report to a receiving team in the emergency department, or to another health care professional in a non-urgent setting, as well as to include in the appropriate patient care documentation.

Discussion

Although the primary and secondary surveys presented in this paper are detailed, we do not intend these to be rigidly prescriptive. We recognise that paramedics may, and must, adapt any aide memoir to the requirements of their particular patient presentation and clinical context. The intent of these surveys is to assist paramedics and paramedic students in their clinical approach, not to prescribe a mandatory checklist for every patient encounter.

The surveys presented are likely to be most useful to students learning to become paramedics, as opposed to existing, veteran paramedics. Working paramedics are likely to be already be utilising the concepts in these surveys in their existing practice. For paramedic students however, memorising over 100 unique concepts to practice in order and without omission, under novel and stressful conditions, is a daunting proposition. It is the author groups' hope that this work will assist them in that effort.

While the complexity of the presented surveys may initially appear daunting, the PI (MAC) has taught a variant of this algorithm with anecdotal student success as measured through assessments.

These surveys present a global perspective, but are weighted in favour of the Australasian (Australia and New Zealand) paramedic context. When looking for CPGs from outside of Australasia the panelists selected CPGs that were national in scope. Many paramedic based CPGs exist internationally, however we did not evaluate these for this work, as the author group were unfamiliar with the context in which they were applied. Therefore, there could well be important concepts that are missing from these primary and secondary surveys. At present, there are no national Canadian CPGs to include in this review, however, the presented work draws on the experiences of two of the authors who are familiar with Canadian paramedic practice and education (AB and MAC).

Although we intended this work primarily for paramedics, any clinician may use these surveys in an out-of-hospital clinical environment. The mnemonic works as an aide-memoire to assist in recollection of the primary or secondary survey. The title "International Paramedic Primary and Secondary Surveys" indicates that these guidelines were drawn from paramedic practice, not that their use should in any way be exclusive to paramedics. The author group welcome and encourage discussion around and adoption of these guidelines by any clinician who would consider them useful.

Conclusion

This paper presents a comprehensive, focused, and memorable pair of mnemonics to guide paramedics and other clinicians through the primary and secondary survey of patient care. It utilises the current best practice of paramedics internationally, and the collective clinical, educational and academic experiences of the panel members. These mnemonics can be used by practicing paramedics to ensure that their care is complete and by paramedic students as they learn to handle the complexity of paramedic practice. The secondary survey also presents a useful structure for formulating patient handover

continued overleaf...

reports. Future research may focus on the usability and uptake of such international guidelines.

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RESEARCH ARTICLE

FIT FOR DUTY: THE HEALTH STATUS OF NEW SOUTH WALES PARAMEDICS

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Abstract

Introduction

Paramedics are health care workers who respond to medical emergencies. Paramedics exhibit high rates of injury and illness with markers of poor health. The aims of this study were to explore the self-reported health status of paramedics in New South Wales, Australia, and to compare it with that of the Australian general population and to examine paramedics' attitudes towards exercise.

Methods

In 2015, paramedics employed by NSW Ambulance were invited to complete a web-based survey composed of the Medical Outcomes Survey Short Form 36 (SF-36), measures of attitudes towards exercise and demographic information. Normative comparator data for the Australian general population (BMI and SF-36 scores) were sourced from the Household Income Labour Dynamics in Australia 2015 survey.

Results

Of the approximately 3,300 paramedics invited to participate, 747 completed the survey (507 male, 240 female). Mean age and mean years of service were 41.5 ± 9.5 (SD) and 13.6 ± 9.0 respectively. Male paramedics scored higher than females ($p < 0.001$) in the Vitality domain of the SF-36, and regional paramedics had a higher General Health domain score than metropolitan paramedics ($p < 0.05$). Regional male paramedics had higher BMIs than their metropolitan counterparts ($28.04 \text{ kg/m}^2 \pm 3.99$ vs. $26.81 \text{ kg/m}^2 \pm 4.67$, $p = 0.001$). Compared to the Australian population, paramedics scored higher in the Physical Function domain ($p < 0.001$) but lower in summary scores for mental and physical health ($p < 0.001$). Paramedics' BMIs were slightly higher than the general population ($27.10 \pm 4.30 \text{ kg/m}^2$ vs. 26.47 ± 5.42 , $p < 0.001$). Paramedics reported lack of time, family commitments, and lack of motivation and in regional postings: distance to fitness facilities and shift patterns as barriers to exercise.

Conclusions

Paramedics scored lower on the SF-36 than the general population, which can indicate a lower health-related quality of life. High BMI and low SF-36 scores may be related to a perceived inability to engage in regular exercise. Increasing BMI can be associated with the development of markers of poor health. Attention is needed to ensure that paramedics are "fit for duty". Ambulance management should foster innovative health promotion programs and paramedics need to recognise and value good health.

Keywords: illness; fitness; wellness; injury; ambulance; exercise

Introduction

Paramedicine is recognized as a physically demanding profession. Examples of demanding manual tasks that paramedics routinely perform range from lifting and carrying patients (1-3), loading and unloading stretchers (4), to performing cardiopulmonary resuscitation (5-7) for extended periods of time. This is coupled with the requirement to undertake clinical decision-making in complex, often uncontrolled social environments on a rotating shiftwork schedule.(8, 9) Yet working paramedics have reported poorer health-related quality of life (HRQoL) and are more likely to be overweight or obese, as estimated by BMI (10-12), than comparator populations.(13) HRQoL is a valuable predictor of other indicators of health status, such as number of physician visits and hospitalisations, and mortality among adults(14) Specifically, rates of hypertension (15), obesity (16) and musculoskeletal injury (17-20) are higher in emergency responders (fire, police and paramedics) than other occupations. In addition, another contributing factor for working paramedics could potentially be linked to where they live and work. For instance, people living in rural and remote areas, where access to goods and services can be restricted, have been reported to experience poorer health than urban dwellers.(21) Approximately 50% of paramedics employed by NSW Ambulance are reported to work in regional areas (as defined by NSW Ambulance) therefore potentially resulting in compromised health due to a lack of access to services and activities.

Over the long term, fatigue, lack of fitness, location and high rates of injury may contribute to poorer health outcomes in paramedics.(8, 22-25). This may be compounded by the likelihood of a higher BMI and therefore, an increased risk for metabolic diseases such as Type II diabetes and cardiovascular disease and with earlier mortality.(26, 27) Despite the well-known benefits of regular physical activity for optimum physical and mental health (28-31) the potential benefits of these for paramedics has not been widely examined. As well, there is a paucity of research on health status and gender in ambulance services.

Aim

The primary aim of this study was to explore the self-reported health status of paramedics employed by a large ambulance service in New South Wales, Australia (NSW Ambulance) by gender and geographic rostering pattern (metropolitan and regional) and to compare these results with that of the Australian general population. A secondary aim was to examine paramedics' attitudes towards exercise and to determine whether paramedics thought that they exercised enough including barriers (if any) that may prevent them from exercising enough.

Methods

Study design and procedures

A web-based survey was conducted using a cross-sectional methodology. An email containing a link to the survey instrument was sent to paramedics' corporate email accounts. The survey was open for 30 days from 11 May 2015 and a reminder email was sent on day 15. Potential participants were informed that no explicitly identifying information would be collected. The survey took approximately 10 minutes to complete.

Participants

All paramedics and trainee paramedics employed by NSW Ambulance as of May 2015 (n = 3,302) were invited to participate in the study regardless of age, gender, years of service, training pathway, level of certification (trainee; intern; qualified; intensive care; extended care; or specialist group: such as, special operations and special casualty access), primary role or geographic rostering (metropolitan or regional). Completing the survey signified consent to participate in the research. Once the survey was completed, there was no opportunity for participants to withdraw their data. Ethical approval was obtained from the South Eastern Sydney Local Health District Human Research Ethics Committee (HREC Reference number: 15/031, LNR/15/POWH/68) and Charles Sturt University Human Research Ethics Committee (HREC Protocol number 2015/011).

Instrumentation

The survey consisted of three parts: Demographic information (age, gender, height, weight, level of certification, rostering, primary role), the Medical Outcomes Survey Short Form 36 (SF-36) (32), widely used in monitoring population health and reporting health related quality of life (HRQoL) (26, 27) and questions examining attitudes towards exercise.

Medical Outcomes Survey Short Form 36

The SF-36 consists of 36 questions that, when scored, measure eight health domains: Physical Functioning (PF); Role Limitations due to Physical Health Problems (RLP); Role Limitations due to Personal or Emotional Problems (RLEP); Bodily Pain (BP); Vitality (V), Social Functioning (SF); Mental Health (MH); and General Health Perceptions (GH). The possible scores for each domain range from zero to 100, with 100 representing the best possible health state. These scores contribute to the construction of two summary measures: Physical Health Summary (PHS) and Mental Health Summary (MHS).(33) Each of these has possible scores from zero to 100, with 100 representing the best possible health state.

Attitudes towards exercise

Two questions examined attitudes towards exercise:

1. Are you currently exercising as much as you would like?
2. "What are the barriers to you not exercising as much as you would like?"

This question could be answered in free text or the paramedics could choose one or more of the following items:

- a. Lack of time
- b. Family/other commitments
- c. Lack of motivation
- d. Lack of energy
- e. Cost of gym
- f. Injury
- g. Lack of, or distance to, facilities.

Comparative normative data

SF-36 data for the Australian population has been collected in national health surveys (34, 35) including most recently in the Household, Income and Labor Dynamics in Australia (HILDA) survey.(36) Age matched HILDA data for 2015 (n = 12,373) was used as Australian population normative data to compare SF-36 results and BMI (n = 8,600).(37) The age range for the Australian data was set at 20-70 years old as this reflects the youngest to the oldest currently employed NSW Ambulance paramedic.(R. High, personal communication, October 15, 2015).

Data analysis

Body Mass Index (BMI) was calculated for both NSW Ambulance respondents and HILDA comparator data using the formula $BMI = \text{body weight (kg)} / \text{height (m}^2\text{)}$. The eight SF-36 domains and the PHS and MHS were scored in accordance with Ware.(38) The question on barriers to exercise yielded qualitative responses that were themed into categories by the primary author.

Prior to statistical analysis data were inspected visually and statistically for normality and are presented as mean \pm standard deviation. A Pearson Chi-square test of independence was performed to establish the representativeness of the survey respondents compared to the NSW Ambulance population based on gender and posting. Differences between paramedics' SF-36 responses and the Australian population, and the responses of male vs female paramedics and regional vs metropolitan paramedics were calculated and descriptive statistics and one way ANOVA employed where the requirements for parametric tests were met. A Pearson Population Correlation Hypothesis Test was computed to assess the relationship between SF-36 scores and BMI. All analyses were performed using SPSS Version 17.0 (Statistical Package for the Social Sciences Version 17.0, SPSS Inc., Chicago, Illinois, U.S.A.) with the threshold for statistical significance set at $p < 0.05$. XLStat (Addinsoft SARL, New York, NY, USA)

was used to impute missing data in the NSW Ambulance SF-36 results using the NIPALS method (39) to allow principal component analysis with missing values. The NIPALS algorithm was applied to the NSW Ambulance dataset and the obtained PCA model is used to predict the missing values.(40) Of the total number of items on the SF-36 survey (26,982) a total of 538 (1.9%) were not answered and therefore imputed.

Results

Response rate and demographics

Of 3,302 paramedics employed by NSW Ambulance in May 2015, 22% (747 total, 507 males) completed the survey yielding an overall response rate of 22% (Table 1).

	Regional	Metropolitan	All
Males	n=268	n=239	n=507
Age (years)	44.27 (9.48)	42.66 (9.3)	43.51 (9.42)
Years of Service	15.37 (9.7)	14.45 (9.09)	14.93 (9.98)
Females	n=111	n= 129	n=240
Age (years)	36.97 (8.18)	37.39 (8.49)	37.20 (8.33)
Years of Service	10.36 (6.56)	9.53 (5.55)	9.98 (6.12)

Table 1. Demographic information NSW Ambulance Paramedics (mean \pm SD)

The results of the Pearson Chi-square test of Independence showed the overall proportion of survey respondents were not significantly different than the NSW Ambulance population by gender (χ^2 3.6554, df 1, $p=0.05589$, CI -0.0490, 0.0002) but were significantly different by posting (χ^2 10.06, df 1, $p=0.001515$, CI 0.8331, 0.0629).

Sixty-three per cent of respondents were qualified paramedics (n= 471); 21% were intensive care paramedics (n= 154); 7% were specialist group (e.g. special operations team, special casualty access team) (n= 53); 6% were intern paramedics (n= 41); 2% were extended care paramedics (n= 17); and 2% were trainee paramedics (n= 11). Participants' primary roles included: clinically practicing (89%) (n= 667), management (6%) (n= 45), education (2.9%) (n= 22) control centre (1.5%) (n= 11), other, i.e., information technology (0.01%) (n< 5).

SF-36: NSW Ambulance paramedics

There were no significant differences by gender except for the Vitality domain where males scored higher (57.61 ± 16.29 versus 53.17 ± 18.37 , $p= 0.001$, CI 1.716, 7.7178). By posting there were no significant differences except for General Health domain where regional paramedics scored higher than metropolitan paramedics (66.50 ± 18.95 versus 63.85 ± 17.89 , $p= 0.05$).

SF-36: NSW Ambulance vs Australian population

There were significant differences in 6 of the 8 domains ($p<0.001$) as well as in the Physical Health Summary score ($p < 0.001$ CI 1.680, 3.958) and Mental Health Summary score ($p < 0.001$, CI 6.994, 9.363), with paramedics reporting lower scores (more disability) in both domains than the Australian population. In the Physical Function domain, paramedics scored significantly higher (less disability) ($p<0.001$ CI -4.323, -2.952) than the Australian population (Table 2).

Body Mass Index (BMI): NSW Ambulance paramedics

There were differences in overall mean BMI scores by gender: male's BMI (n=507) 27.53 ± 4.05 kg/m² was higher than female's BMI (n=240) 26.61 ± 4.38 kg/m² ($p= 0.001$ CI 0.499, 2.059). By posting, there were differences between regional paramedics (n= 379) with higher BMI than metropolitan paramedics (n= 368) (27.49 ± 4.30 kg/m² vs 26.60 ± 5.12 kg/m², $p=0.01$, CI -1.57, -0.218). With regard to location and gender, regional males (n= 268) had higher BMI than metropolitan males (n= 239) (28 ± 3.99 kg/m² vs 26.8 ± 4.67 kg/m², $p = 0.001$, CI -1.99, -0.468) whilst there were no significant differences in mean BMI between regional (n=129) and metropolitan (n=111) females (26.17 ± 4.75 kg/m² vs 26.19 ± 5.85 kg/m², $p= 0.977$, CI -1.343, 1.383).

NSW Ambulance and Australian population

There was a difference between the Australian population's mean BMI score ($26.47 \pm 5.42 \text{ kg/m}^2$) and paramedics' ($27.10 \pm 4.30 \text{ kg/m}^2$) ($p < 0.01$, CI -0.850, -0.126).

Exercise

Responses to the question: "Are you currently exercising as much as you would like?" found that 72% (n=548) of all respondents reported 'No'. Those answering 'No' had significantly higher BMI scores than those answering "Yes" ($27.5 \pm 4.91 \text{ kg/m}^2$ vs $25.9 \pm 4.02 \text{ kg/m}^2$, $p=0.001$, CI -2.29, -0.90).

	NSWA Survey (n=747) Mean (SD)	Australian Population (n=12,393) Mean (SD)	Significance level (1 tailed)
Physical Function	91.58 (8.27)	88.09 (19.04)	<.001
Role Physical	80.58 (30.06)	86.67 (29.98)	<.001 *
Body Pain	75.82 (18.88)	76.40 (21.0)	> .05
General Health	65.21 (18.40)	70.37 (18.91)	<.001 *
Vitality	56.20 (17.04)	61.69 (18.26)	<.001 *
Social Function	70.18 (17.70)	86.22 (19.43)	<.001 *
Role Emotional	74.08 (37.31)	87.62(27.93)	<.001 *
Mental Health	74.54 (16.40)	75.24 (16.0)	>.05
Physical Health Summary	73.55 (14.54)	76.65 (14.96)	<.001
Mental Health Summary	68.02 (16.08)	76.23 (15.06)	<.001 *

Table 2. SF36 Scores NSW Ambulance and Australian Population. Note an (*) denotes a clinically meaningful difference according to Ware (1994).

Barriers to Exercise

Lack of Time was the most frequently selected barrier followed by Family/Other, Lack of Motivation and Cost of Gym. Barriers to exercise were not different by posting except for Lack of, or Distance to Facilities (Figure 1 overleaf).

Free text responses describing barriers to not exercising as much as you would like (n=117) were examined and themed into six categories: (1) on call (n=62, 53%), (2) roster (n=19, 16.2%), (3) other (e.g. injury) (n=16, 13.3%), (4) lack of energy/fatigue (n=9, 7.7%), (5) study (n=7, 6%), and (6) gym access (n=4, 3.4%). 'On call' is a specific type of rostering where a paramedic may spend a portion of time not at station but responsible for responding to emergency calls before, during or after regularly scheduled shifts at station. On call rostering is predominantly utilised in regional postings.

Discussion

The primary aim of this study was to explore the self-reported health status of paramedics employed by New South Wales Ambulance, by gender and geographic rostering pattern (metropolitan and regional) and to compare those to the Australian general population. A secondary aim was to examine paramedics' attitudes towards exercise and to determine whether paramedics thought that they exercised enough, including barriers (if any) that may prevent them from exercising enough.

SF-36

In regard to SF-36 results by gender and posting, there were significant differences only in Vitality and General Health domains suggesting little difference in these paramedics report overall HRQoL. There is little in the literature to utilise as occupational comparators for paramedics, however recent research by Pek et al. (41) on the health of paramedics working in Hungary reported SF-36 scores similar in respect to NSW Ambulance paramedics. Both groups reported lower scores on the Vitality domain which

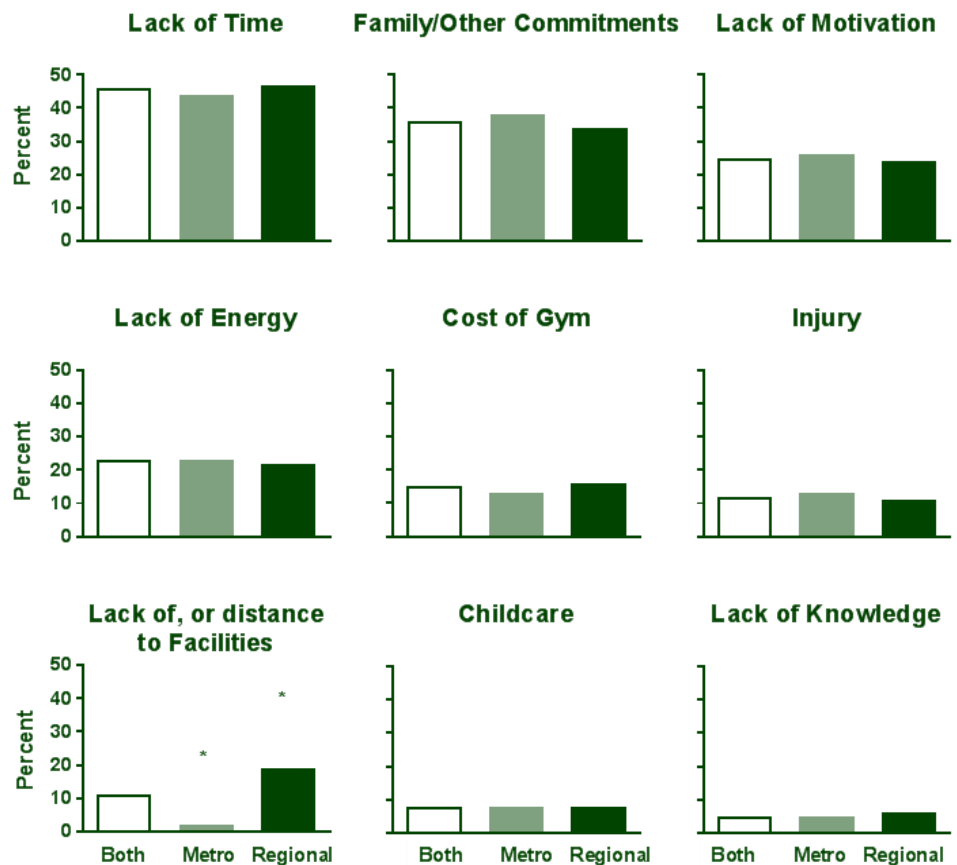


Figure 1. Barriers to Exercise by posting illustrates the frequency of paramedic responses to perceived barriers. Note the significant difference (* p<0.001) in response rate (regional versus metropolitan) for lack of or distance to facilities.

can indicate feeling tired and worn out. The lack of disparity in scores in gender and posting has been reported in one other study of paramedics using the SF-36 where they found no difference by emergency unit.(42) It could indicate that the work of a paramedic influences the respondent regardless of these variables.

The importance of monitoring the health status of paramedics is illustrated when examining their scores compared to the general population. Paramedics did score higher in Physical Function, but reported lower scores in six of the eight domains and both summary scores. There is a paucity of literature on the HRQoL in paramedics, so must be examined indirectly. The work by Courtney et al. (8) reported high levels of fatigue and poor health in paramedics in Victoria, Australia, due to shiftwork and occupational demands, which could contribute to the understanding of paramedics' lower SF-36 scores. The Victorian paramedics also reported lower levels of physical activity than the population and this was linked to shiftwork patterns.

Body Mass Index

Published literature suggests that a BMI of 18.5-24.9 kg/m² is a normal weight. Above that cutoff, there is an increased association with higher all-cause mortality.(26, 27) The average BMI of NSW Ambulance paramedics was 27.1 ±4.31 kg/m². These findings are consistent with a study of US paramedics (n=19,960) of 27.7 ±4.96 kg/m² (43) but were lower than a study of Canadian paramedics (n=295) of 29.8 ±4.9 kg/m². By gender and posting, regional rostered male paramedics had significantly higher BMI than their metropolitan counterparts. There appears to be no substantive literature about BMI in paramedics with regard to rostering or geographic area, therefore, it is hard to comment if this is a clinically significant finding in this paramedic service. Regional paramedics appear to follow the trend of rural Australians in having a higher BMI than their urban counterparts.(44) However, noting that call volumes are generally lower in regional compared to metropolitan areas in NSW Ambulance this could contribute to reduced

physical activity during work hours as the paramedic awaits the next call. This would be consistent with a U.S. study that found urban nurses had higher levels of physical activity and lower BMIs than rural nurses.(45) Certainly, regular physical activity, even if job-related incidental, or more structured exercise can positively influence BMI.(46) Furthermore, this could contribute to the high rates of illness and injury as has been reported in other studies.(47) Prehypertension and hypertension have already been reported in up to 75% of emergency responders (15) and a Canadian study of paramedics reported similar rates of overweight and obesity (79% of respondents), the majority also reported at least one cardiovascular risk factor.(48) Given the relatively young workforce as reported in this study (mean age 41.5 ± 9.5 years old) an increasing BMI might contribute to diminished health outcomes as their careers progress.

Paramedics had a higher BMI than the Australian population although the mean for both populations falls in the BMI category of overweight. This difference is small (0.6 kg/m^2) so results should be interpreted with caution. Both populations could have a higher chance of early mortality (7% higher compared to healthy BMI) as reported by to Di Angelantonio et al. (2015).(27) It must be noted that BMI defines height/weight characteristics. It is not a useful indicator of percent body fat.(12)

Barriers to Exercise

Paramedics overwhelmingly stated they are not exercising as much as they would like to. They also identified a series of barriers to not exercising as much as they would like. Both metropolitan and regional paramedics identified 'lack of time' and 'family or other commitments' as preventing adequate exercise. This could be expected given the nature of shift work and the age group of the participants, which would include many young parents. Interestingly, compared to metropolitan paramedics, regional paramedics were more likely to select 'lack of, or distance to facilities' as a barrier to exercise. This draws attention to the need for paramedics to have access to exercise facilities, for instance in the workplace. Many of the respondents (53%) indicated that being 'on call' is a barrier to exercise, therefore, this type of rostering should be examined with regard to allowing time to exercise. The implication is that access to facilities and/or time to engage in regular physical activity could contribute to a healthier paramedic with more functional capacity for the physical demands of job performance.

In examining solutions for paramedics' low health status, Merrill (49) presented recommendations for health improvement. These included service-specific exercise education and functional movement training, and general physical ability assessment with lifestyle advice (e.g. healthy eating). Further, they advocate the use of peer fitness trainers as well as support by management. It has been reported that NSW Ambulance has introduced the 'Fitness Passport' program across all stations and this is seen as a positive move. This is a corporate health and fitness program that allows its members to access a wide range of their local health and fitness suppliers.(50) Uptake may be limited in regional areas based on the lower levels of participation of gyms and health clubs. A number of regional stations have recently taken part in a research project examining the effect of an on station physical fitness program.

Limitations

The use of corporate email to inform and solicit potential study paramedics may have limited participation (for example if the paramedic did not check his/her email account during the study period or if they were concerned about confidentiality). Similarly, the reminder email sent through to corporate email accounts may have limited participation for the same reason. NSW Ambulance survey data was collected using an online survey while the HILDA data was collected through telephone survey. It is worth noting that there may be a selection bias in this study as only those paramedics who wanted to complete the survey did so.

BMI is not accurate in estimating percent body fat and is used in the context of this study for its associations with other measures of health status. It is worth noting that self-reported height and weight is known to underestimate BMI though the magnitude of bias is small.(51) Use of the question regarding barriers to exercise may have been leading, however 117 paramedics validated the question by responding with their own open text responses.

Conclusion

Health status based on SF-36 and BMI results differed among NSW Ambulance paramedics. Relatively uniform SF-36 scores within the population of paramedics suggest that, as an occupation, their HRQoL may be adversely affected by their job. In terms of BMI, regional-rostered paramedics had significantly higher BMIs than those posted to metropolitan areas and this may be due to shift pattern, lower call volume and therefore more sedentary time and a lack of suitable exercise facilities. The NSW Ambulance paramedics reported generally lower health status scores than the Australian population, which is noteworthy. This would indicate a need to measure and compare the two groups longitudinally. Both the paramedics and the Australian population have BMI's that are higher than that termed normal and could indicate an elevated risk for metabolic disease.

Paramedics have a responsibility to maintain their own health as they look after the health issues of their patients. Paramedic services have an opportunity to be an active partner with the paramedic to ensure that the workforce is as healthy and productive as possible. For both, there must be an attention to the potential risks to the health of paramedics in this very challenging and demanding occupation, and identifying strategies to mitigate those risks.

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CONFERENCE ABSTRACTS

**ABSTRACTS FROM THE EMS GATHERING 2018, SEPT
11TH -13TH 2018 & IRISH COLLEGE OF PARAMEDICS
SCIENTIFIC SYMPOSIUM SEPT 15TH, CORK, IRELAND,**

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 **OPEN ACCESS ARTICLE**

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Author affiliations: outlined per individual abstract.

Introduction

The editorial board of the Irish Journal of Paramedicine (IJP) is honoured to present these abstracts accepted for presentation at the EMS Gathering, 11th to 13th of September 2018 in Cork, Ireland, and the Irish College of Paramedics Scientific Symposium, 15th September 2018 in Cork, Ireland. As part of our commitment to furthering the profession of paramedicine, and encouraging future development of professional standing, we publish this special supplement containing the selected abstracts.

These abstracts represent academic dedication, intellectual discovery, enthusiasm and for some, a foray into a new territory of research and academia. We are grateful for each and every one of these authors' commitment to the advancement of our profession. We are privileged to publish these brief summaries of some of the novel and exciting research our colleagues are undertaking. Abstracts were received from several countries around the world, including Ireland, England, Scotland, and Canada.

This year the EMS Gathering and the ICoP Scientific Symposium combined received 30 abstracts for consideration. 28 were deemed appropriate for review consideration. 28 of the submissions (100%) were accepted: 14 for oral presentation, and 14 for poster presentation. Four authors subsequently withdrew their abstracts from presentation after acceptance. Each abstract was independently reviewed by reviewers who were blinded to the identities of the authors. Final determinations for scientific presentation were made by the Abstract Review Committees. The decisions of the committees were based on the final review scores, with consideration to the time and space available at the meeting for oral and poster presentations.

We present these abstracts as they were received, with minimal copyediting and proofreading. Any questions related to the content of the abstracts should be directed to the authors. Please note that the abstract numbers presented here do not match the presentation numbers at the meetings. Some abstracts have not been published in this supplement at the request of the authors to avoid potential publication conflicts.

On behalf of the editorial board of the Irish Journal of Paramedicine, the Irish College of Paramedics and the organising committee of the EMS Gathering 2018, we sincerely thank our colleagues for these valuable contributions, and their continued efforts to expand the knowledge base of paramedicine and prehospital care, ensuring we constantly strive to deliver the best care to our patients, and the best education to our prehospital care professionals.

Review process

In choosing abstracts for the meeting, our goals are logic, fairness, and transparency. We do not believe one form of research is inherently better than another. In the interests of transparency and fairness, we are pleased to share our abstract scoring criteria (Figure 1). Remember, scoring is a judgment call. As an author, one is welcome to use the criteria to score one's own abstract, but this won't change how the reviewers score the abstract on review.

All abstracts were reviewed in a blinded manner. Reviewers indicated if they had any potential conflict of interest during the review process (knowledge of the submitting authors or the work of specific abstracts etc.). No conflicts were declared by reviewers. Abstracts were scored on the content of the abstract, educational value, and quality of the written abstract.

- **Content of the abstract**—scientific accuracy and relevance of the abstract, as described in the outlined headings: Introduction/Background, Objectives, Methods, Results and Conclusion/Discussion.
- **Education value**—what interest and appeal would this abstract hold to the audience. Does it represent a contribution to practice, theory, research or knowledge, and how novel or innovative is this contribution? Is the topic relevant to conference?
- **Quality of the written abstract**—is the abstract self-contained, coherent and readable?

Scores from each reviewer were tallied, and the mean score was calculated for each abstract. Abstracts were then ranked according to mean score. Abstracts were selected for oral presentation based on highest mean scores. Other abstracts were ranked in order for poster presentation.

Quality of abstract content /25	Introduction
	Objectives
	Methods
	Results
	Conclusion
Educational value / 15	Interest and appeal to audience
	Contribution to practice, theory, research or knowledge
	Novel or innovative contribution, relevant to conference
Quality of written abstract / 10	Self-contained
	Coherent and readable

Figure 1. abstract scoring criteria

Abstract notes: EMSG = presented at EMS Gathering; ISS = presented at ICoP Scientific Symposium.

Abstract Reviewers

Associate Professor Alan Batt MSc PhD(c)*
 Associate Professor Conor Deasy MB BCh BAO PhD
 Dr. John Glasheen MB BCh BAO MSc
 Dr. Siobhan McCoy PhD PGCert RCN RGN
 Professor Shane Knox PhD MSc
 Ms. Shannon Delpert MTech PhD(c)
 (* excluded from peer-review)

A01.EMSG. Breakfast Education Sessions - a novel approach to learning.

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Introduction: The need for continuing professional development is well recognized and is supported by professional bodies in all healthcare disciplines. It can be difficult to access CPD for those who work shift. Aims: To create a multidisciplinary learning environment within a National Ambulance Service (NAS) station. To describe the participants responses to the education sessions by the participants of the sessions: on whether they thought they were helpful, they learned anything and if they thought it contributed towards team building. **Methods:** The National Transport Medicine Programme (NTMP) has recently become a service within the National Ambulance Service (NAS), under the new name of the NAS Critical Care & Retrieval Services (NASCCRS). This service is responsible for transporting critically ill neonates, children & adults with a multidisciplinary team. The Breakfast education sessions were planned a number of months in advance with the purpose of creating a multidisciplinary learning environment. The sessions lasted for no more than one hour from 7.30am-8.30am once a month. The sessions often focused on topics that the teams encountered during their clinical work. The sessions were also started to further enhance and build the multidisciplinary team consisting of NAS staff and the NASCCRS medical teams. The participants were sent a questionnaire to assess their attitudes towards the sessions. **Results:** Most participants believed that the sessions were very enjoyable and that they learnt from them. They also felt that the sessions created a sense of teamwork and they got to know the greater team more. They felt the way it was run was relaxed and was easy to attend as it was mostly during work hours. Almost all the results were positive towards the sessions. **Conclusion:** The breakfast education sessions created by the team at the National Ambulance Service Critical Care & Retrieval Services are a novel idea to learn, build teams and more importantly eat breakfast! We plan to extend the sessions with a view to streaming them in the future.

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A02.EMSG. Do RATs save lives? A retrospective analysis of out-of-hospital cardiac arrest in an English Ambulance Service.

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<https://doi.org/10.32378/ijp.v3i2.165>

Introduction: Out of hospital cardiac arrest (OHCA) is a major public health problem leading to a substantial number of deaths in the UK. Survival to discharge rates in the UK have remained below that of the best performing European countries. In response to this, Yorkshire Ambulance Service (YAS) has introduced several initiatives to improve outcome from OHCA including the introduction of Red Arrest Teams (RATs). This study aims to determine the impact of the RATs on survival to 30 days and return of spontaneous circulation (ROSC) at hospital. **Methods:** A retrospective cohort study analysing routinely collected data was undertaken. All adult (≥ 18 years) OHCA entered onto the YAS computer aided dispatch (CAD) system between the 1st October, 2015 and 30th September, 2017 were included if the patient was resuscitated, and the cause of the arrest was considered to be medical in origin. Multivariable logistic regression models were created to enable adjustment for common predictors of survival and ROSC. **Results:** During the 2-year data collection period, 15,151 cardiac arrests that were attended by Yorkshire Ambulance Service. After removing ineligible cases, 5,868 cardiac arrests remained. RATs attended 2,000/5,868 (34.1%) incidents, with each RAT attending a median of 13 cardiac arrests (IQR 7–23, minimum 1, maximum 78). The adjusted odds ratios suggest that a RAT on scene is associated with a slight increase in the odds of survival to 30 days (OR 1.01, 95%CI 0.74–1.38) and odds of ROSC on arrival at hospital (OR 1.13, 95%CI 0.99–1.29), compared to the odds of not having a RAT present, although neither results are statistically significant. **Conclusion:** The presence of a RAT paramedic was associated with a small increase in survival to 30 days and ROSC on arrival at hospital, although neither were statistically significant. Larger prospective studies are required to determine the effect of roles such as RAT on outcomes from OHCA.

A03.EMSG. Preparing The Critically Ill Adult Patient for Transfer

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Background: The reorganisation of hospital services in Ireland, the development of hospital groups, centralisation of specialties and reconfiguring of smaller hospitals necessitates inter hospital transfer of patients requiring specialist care to an appropriate hospital that meets their clinical needs. In Ireland, in excess of 1000 adult critical care inter hospital transfers occur per annum.(1) The ‘hub-and-spoke’ model is aligned with the hospital group structure and connectivity between hospitals is provided through agreed transport and retrieval services. These transfers are generally undertaken by local teams (usually an anaesthetic NCHD and a nurse) using an emergency ambulance and crew. Multidisciplinary team training is provided, by Critical Care Retrieval Services, using local resources in a framework enhancing safety and preparedness. **Aims:** A critical care transfer checklist with a systematic approach provides a framework to address the elements of critical care, transport physiology changes and reduce potential adverse events when transferring critically ill patients.(2) The use of transport specific adjuncts and packaging the patient systematically not only addresses transport issues e.g. temperature, but also facilitates emergency interventions en route. **Conclusion:** Patient safety is a fundamental principle in healthcare and is the responsibility of healthcare practitioners to apply quality improvement methods to effect process and system improvements. The use of a systematic approach to patient management when transporting critically ill patients establishes a higher level of performance reduces cognitive dissonance and provides a framework for clinical teams and reduces the potential for human error.(3)

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A04.EMSG. Thoughts, Ethics and Actions in Emergency Medical Services Photography.

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“Photography can only represent the present. Once photographed, the subject becomes part of the past.” - Berenice Abbott (July 17, 1898 – December 9, 1991).

A picture tells a thousand words...a bride, a storm, a child killed by a bomb; a photo of is a moment in time, a split second & then becomes history. So what of the role of photography in Emergency Medical Services (EMS)? It is about education, history, documenting, & recording & promotion. Important daily personal memories are imprinted when say, we have coffee with our colleagues and we talk about a call we did, maybe a bad call, someone breaks the tension; *“Time for a photo?”* A time will come when we look back & remember not only a bad call, but also who had our back that day. Old photographs of EMS show us how far we have come in terms of equipment, personnel, and training. Without photos we would have no reference point. It’s a sobering thought that the EMS photos we take today in good faith may in fact be the warnings of tomorrow. Of course there is a graphic side of EMS photography. Photographers are rightly held to account to portray individuals and scenes with the utmost respect to the patient and their families,1. Passersby can be opportunistic and sometimes thoughtless at crisis scenes. Is it OK to photograph a person in their dying minutes? Graphic photos taken by EMS personnel are used as visual aids when in the Emergency Department (ED) in our hospitals. But where is the line drawn...or is there a difference?

The National Press Photographers Association (NPPA) Code of Ethics Summary guide expresses this nicely as, 3; *“Photographic and video images can reveal great truths, expose wrongdoing and neglect, inspire hope and understanding and connect people around the globe through the language of visual understanding. Photographs can also cause great harm if they are callously intrusive or are manipulated”*.

“No, it’s personal” When we take photos of our colleagues and other emergency services, we have a responsibility to protect our other front line colleagues. Underneath the uniform is a person, who is taking on and then managing risks on behalf of others. We are proud of the people who protect us, who run to us in our hour of need, who face fire and fight to save the lives of loved ones. A ‘smiling selfie’ drinking coffee can cover up the previous callouts of an attack with a bloody syringe, the sudden quiet of people inside a burning building, or the distressed relatives at the loss of a child. Take out your cameras, with a photo a moment in history is saved. Along with the images, emotions are stored. But always with a caution and a nod to the ethical code of conduct above; The photographer’s intent is where the red, blue, green, and white line is drawn...

A05.EMSG. Why MICAS?

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Introduction: The Mobile Intensive Care Ambulance Service (MICAS) was initiated in 1996 to assess, stabilise and transfer critically ill patients from a referring hospital to a receiving hospital to meet their clinical needs. Critically ill patients are transferred throughout Ireland to an increased level of care, repatriation for continuity of care following specialist treatment, specialist critical care services or in some instances, are considered too unstable to be transported by local staff.(1,2) In 2015, it was estimated that approximately 1,000 ICU patients are transported per annum.(3) These numbers are likely to increase as a result of the reorganisation of health services, the development of hospital groups, the establishment of the hub and spoke critical care services and introduction of trauma centres. This increases the requirement of inter hospital transfers throughout the country. **Aims:** The aim of this audit was to establish the rationale for a critical care retrieval service and to evaluate the adverse events for inter hospital transport of critically ill patients in Ireland over a 3 year period. **Methods:** A retrospective chart review of all patients transported by MICAS between January 2015 and December 2017 was undertaken. Clinical records were reviewed for acuity and for adverse events. **Results:** 339 patients were transported in this timeframe with 7% experiencing an adverse event overall. **Conclusion:** The MICAS data shows an increasing number of critically ill patients transferred by MICAS within the timeframe. The rationale for MICAS includes the provision by a specialist team with transport specific equipment with reduced adverse events.

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A06.EMSG. Advanced Paramedic Delivered Finger Thoracostomy

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Introduction & Aims: Tension pneumothorax is a potentially fatal but reversible injury encountered in major trauma and traumatic cardiac arrest. Needle decompression has been the standard treatment approach pre hospital in Ireland and internationally. However, concerns exist regarding the effectiveness of this approach due to anatomy and body habitus. We aim to describe the training, introduction and experience of finger thoracostomy by advanced paramedics within a pre hospital service in Ireland. **Methods:** Finger thoracostomy has been advocated as an alternative pre hospital treatment which is both diagnostic and therapeutic. Paramedic delivered thoracostomy is commonplace in pre hospital critical care services internationally. The MCI Medical Team (as part of Motorsport Rescue Services) is a PHECC-registered multidisciplinary team which provides medical cover at motorcycle road racing events in Ireland. The MCI Medical Team has significant experience of major trauma and routinely performs pre hospital anaesthesia for trauma patients. We introduced a training module on finger thoracostomy, comprising: theory, practical instruction and assessment for advanced paramedic members of the team. **Results & Conclusions:** Advanced paramedic members of the team we trained to deliver finger thoracostomy in predefined circumstances when operating as part of the MCI medical team. To date, advanced paramedic delivered finger thoracostomy has been utilised on three occasions. Introduction of advanced paramedic delivered thoracostomy is a feasible and effective technique for the treatment of tension pneumothorax within a closely governed system.

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A07.EMSG. Are the current pain assessment tools used by paramedics in Ireland, suitable for use with cognitively impaired (dementia) patients?

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Background: Dementia is a disease affecting 55,000 Irish people.(1) It is characterised by progressive cognitive impairment, ranging from mild impairment, which may affect memory, to severe impairment where the ability to communicate may be absent. These people are at risk of having their pain under-assessed and undermanaged.(2) A survey exploring Irish Paramedics and Advanced Paramedics views on the current pain assessment tools available to them, and whether these tools are suitable for use with dementia patients is proposed. Existing observational pain assessment tools used with dementia patients are examined and their suitability for pre-hospital use discussed. **Introduction:** Adults with cognitive impairments, such as dementia, are at a much higher risk of not receiving adequate analgesia for their pain. (3) It is estimated between 40% and 80% of dementia patients regularly experience pain.(4) Current pain assessment tools used pre-hospital in Ireland are: Numerical Rating Scale for patients >8yrs, Wong Baker Scale for pediatric patients and the FLACC Scale for infants. There is no specific pain assessment tool for use with patients who are not capable of self-reporting their level of pain. **Objective:** This research aimed to identify observational pain assessment tools used in this cohort. The most consistently recommended tools were identified. The suitability of these tools for use in the pre-hospital setting assessed. **Findings:** Literature review identified 29 observational pain assessment tools. There is a lack of literature relating to the pre-hospital setting. The American Geriatric Society (AGS) identified six pain behaviors in dementia patients, changes in facial expression, activity patterns, interpersonal relationships and mental status, negative vocalisation, change in body language. These six criteria should be the foundation of any pain assessment tool. (5) The three most consistently recommended tools identified were as follows: Abbey Pain Scale: 6 items assessed, meets AGS criteria, quick and easy to implement, moderate to good reliability and validity (6); Doloplus 2: 15 items assessed, meets 5 of 6 AGS criteria, requires observation over time, prior knowledge of patient required, moderate to good reliability and validity (6); PAINAD: 5 items assessed, meets 3 of 6 AGS criteria, less than 5 minutes to implement, may be influenced by psychological distress, good reliability and validity. **Conclusion:** The ability to self report pain is deemed “gold standard”. Patients with mild to moderate disease, and indeed, some with severe disease, may retain the ability to self report. An observational tool is required when dementia has progressed to the point where the patient becomes unable to self report or becomes non-verbal. It is in these patients where undetected, misinterpreted or inaccurate assessment of pain becomes frequent. The aim of any tool is to gain a good assessment of pain, however, the pain scale used should be suitable to the clinical setting. The feasibility of an assessment tool is an important factor along with reliability

and validity. No one assessment tool could be recommended over another. Abbey and PAINAD have potential for use pre-hospital, however, further research, clinical evaluation and trial in an ambulance service is required.

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A08.EMSG. Pit Crew Approach to Pre Hospital Trauma Resuscitation

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Introduction: Pre hospital trauma care is often delivered by dual crewed ambulances supported by additional resources as necessary and available. Coordinating resuscitation of a critically injured patient may require multiple simultaneous actions. Equally, a large number of practitioners can hinder patient care if not coordinated. **Aims:** To describe a multi disciplinary, scalable approach to pre hospital trauma care suitable for small and large multi disciplinary teams. **Methods:** The MCI medical team (as part of Motorsport Rescue Services) is a PHECC-registered multidisciplinary team, which provides medical cover at Motorcycle road racing events in Ireland. The MCI medical team has significant experience of major trauma and routinely performs prehospital anaesthesia for trauma patients. We have evolved a pit crew approach to trauma care with pre defined roles and interventions assigned to a five person team, three clinical members, a scribe and a team lead. The approach is both scalable and collapsible, meaning that if multiple patients are present, roles can be merged; if additional clinical input is required, roles can also be supplemented. Each team member carries equipment and medications specific to their role, allowing efficiencies at the patients side. **Results:** The pit crew approach to pre hospital trauma care has evolved over a decade and is routinely implemented at motorcycle road races in Ireland. **Conclusions:** The pit crew trauma approach, although applicable to a pre defined five person team in unique circumstances, may also be applicable to ad hoc clinical teams that typically form in the pre hospital arena.

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A09.ISS. Empathy Levels in Canadian Paramedic Students: A Longitudinal Study

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Background: Empathy in healthcare delivery is an essential component to providing high-quality patient care. Empathy in paramedics and paramedic students has been subject to limited study to date. This study aimed to determine the empathy levels demonstrated by first year paramedic students over the course of their first year of study. **Methods:** This study employed a longitudinal design of a convenience sample of first year paramedic students in a community college program in Ontario, Canada. The Medical Condition Regard Scale (MCRS) was used to measure empathy levels across four medical conditions: intellectual disability, suicide attempt, substance abuse and mental health emergency. Surveys were conducted three times approximately 2-3 months apart; before first semester field placements (Nov/17), after first semester field placements (Jan/18) and near the end of second semester field placements (Mar/18). **Results:** A total of 20 students completed all three surveys. Females, respondents aged 22-24, and participants with previous post-secondary education demonstrated higher mean empathy scores than their counterparts. Substance abuse was associated with the lowest mean empathy score for every demographic. Mean scores for intellectual disability, attempted suicide and mental health emergency decreased from the first survey to the last. Mean scores for substance abuse increased from 43.3 (SD±8.2) to 46.45 (SD±7.04). **Conclusion:** Results from this study suggest that in general, empathy levels among paramedic students decline over the course of their education. Male paramedic students are less empathetic than their female counterparts, and those with previous post-secondary education displayed higher mean empathy scores. The findings in this research support previous findings, and suggest that paramedic education programs may benefit from the inclusion of additional empathy training and education.

A10.ISS. Barriers perceived by volunteer EMTs in Participating in Continuous Professional Development in Ireland.

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Introduction: Following the re-launch in 2016 of mandatory Continuous Professional Competency (CPC) for Emergency Medical Technicians (EMT) by the Pre-Hospital Emergency Care Council (PHECC) Ireland (1), it is the aim of this research to explore volunteer EMTs perceived attitudes, barriers and confidence in relation to participating in CPC. **Methods:** A questionnaire for EMTs was distributed to the four main pre-hospital volunteer organisations and via the PHECC CPC coordinator social media account (Facebook) to gather information on attitudes towards CPC, perceived barriers to participating in CPC, and finally comfort level in completing the didactic aspects of CPC. **Results:** In total 341 eligible responses accounting for 15% of EMT registrants were analysed. 65% believed CPC was necessary for professional development, with 61% reporting it an important part of their practice. 57% believed CPC should be linked with maintaining PHECC registration, showing a decline of 38% against recent Irish research. The unique profile of respondents as volunteers highlights barriers commonly cited in the literature as having a more significant impact on CPC participation, most noteworthy over 80% cited time and access to relevant material/courses as impacting on participation. A 40/60 split between 2nd and 3rd level educational qualifications among respondents highlighted a marked difference in perceived confidence for completing didactic CPC elements among graduates with 2nd level reporting confidence at a third that of the level of 3rd level graduates. Compounding this finding, 52% of respondents reported receiving little or no training in CPC. Additionally, respondents cited restricted or no access to online journal or materials due to poor links via PHECC Registered Training Institutions or representative bodies to academic library access impacting on their ability to complete the didactic element of CPC. **Recommendations:** It is recommended that the PHECC 2014 EMT Education and Training Standard (2) be updated to include standardised CPC education for newly qualified EMTs. To fulfil case studies, reflective practice and literature reviews, volunteer EMTs require access to online journals and treatment information beyond the pre-hospital arena, all of which require immediate and viable solutions for successful completion of CPC by EMTs.

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A11.ISS. It's good to talk! Reflective Discussion Forums to support and develop Reflective Practice among Pre-Hospital Emergency Care Practitioners in Ireland.

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Background: Since the mid 1980's, reflective practice has become formally acknowledged and adopted as a key strategy for learning and has become one of the cornerstones of medical education for doctors, nurses, and many of the allied healthcare professions. In the education of pre-hospital emergency care practitioners in Ireland, it is only in the last decade that the notion of reflective practice has been tentatively approached. Indeed until recently it has largely been ignored by practitioners and educators alike, who have been slow to engage with this new way of learning. This paper explores the attitudes of practitioners to the use of a reflective discussion forum to encourage and support reflection and reflective practice among pre-hospital emergency care practitioners in Ireland. It also examines the experiences of practitioners who participated in a collaborative reflective discussion forum. **Literature:** The research was informed by reviewing literature from a number of areas including: Adult Learning, Reflective Practice, Educational Research directly relating to Emergency Medical Services (EMS), and EMS & Nursing Journals and publications. **Methodologies:** This paper is part of a larger project which consisted of three cycles of action research. Data was collected via an online survey questionnaire, and by conducting a series of semi-structured interviews with participants in the reflective discussion forum. These included all three clinical levels of pre-hospital emergency care practitioners and the three hierarchical levels within the organisation. **Findings:** The collaborative reflective discussion forum was found to be beneficial. Among the benefits cited were, the opportunity to draw on the experience of more experienced colleagues, the development of critical thinking skills, and the potential for use as part of a mentoring process. It was also felt that the collaborative nature of the forum had the potential to improve workplace relationships through the empowerment of the staff. Concerns were raised regarding the potential for abuse and misuse, particularly in relation to the areas of patient confidentiality and a lack of trust within organisations. **Recommendations:** The establishment of a regular Reflective Discussion Forum within organisations as a key learning strategy. Any collaborative forum must be chaired by a trusted, experienced and highly skilled facilitator. A learning contract for all participants and faculty, including a confidentiality agreement, must be in place prior to the establishment of any collaborative forum.

A12.ISS. Strategies for incorporating patient safety education in paramedic education using the IHI Open School.

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Introduction: Every year, thousands of patients die and millions are harmed by medical care provision. Paramedics care for patients in dynamic, and challenging environments every day, which creates conditions that are ideal for mistakes to occur and for harm to be caused as a result. Knowledge of patient safety is recognised as a competency for paramedics in several jurisdictions, yet general awareness among paramedics of patient safety issues remains poor. The Institute for Healthcare Improvement (IHI) Open School courses were identified as a potential solution to this identified gap. These courses have been successfully integrated into various health professions education programs in other institutions; however, no literature was discovered which discussed the integration of these courses into paramedic education. **Methods:** Eight online courses from the 13-course IHI Basic Certificate in Quality and Safety were embedded into the curriculum of a professional issues class in a paramedic diploma program in Ontario, Canada. Courses were completed outside of classroom time over one semester, and a percentage of activity marks for the class were awarded to students on the completion of the eight courses. Students provided a copy of certificates to prove completion of training. **Results:** In this pilot program, 41 paramedic students in the class (98%) completed all 13 courses, and were awarded the IHI Basic Certificate in Quality and Safety. Students described the courses as “highly applicable to paramedicine and pre-hospital care”. In addition, students state that completing the certificate gave them knowledge of “the means by which change can be enacted”. The completion of the courses outside of class time was achievable, and feedback from students has been overwhelmingly positive. An additional 43 students are currently enrolled in the courses, with completion expected by December 2018. **Conclusion:** The IHI Open School courses are an easy to implement strategy for paramedics looking to gain a brief, concise education on quality and patient safety. It is our goal to integrate the IHI Open School Basic Certificate across all classes in the two-year diploma program. We hope this will lay a foundation for professional practice that is based on safe, high-quality care provision.

A13.ISS. Driving me crazy: the effects of stress on the driving abilities of paramedic students.

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Background: Previous research has demonstrated that stress has a negative impact on the performance of paramedics while performing medical related tasks. Acute stress has also been shown to negatively impact the driving abilities of the general population increasing the number of critical driving errors performed. No literature was discovered that discussed the effects of stress on the driving abilities of paramedics. **Methods:** Paramedic students underwent a driving ability assessment in a driving simulator. We then exposed them to a stress inducing medical scenario. Another driving assessment was then conducted. The numbers, and types of errors were documented before and after the scenario. **Results:** 36 students participated in the study. Paramedic students demonstrated no increase in overall error rate after a stressful scenario, but demonstrated an increase in three critical driving errors; failure to wear a seatbelt (3 baseline v 10 post stress, $p=0.0087$), failing to stop for red lights or stop signs (7 v 35, $p<0.0001$), and losing controlling of the vehicle (2 v 11, $p=0.0052$). **Conclusion:** Paramedic students demonstrated an increase in critical driving errors after a stressful simulated clinical scenario. Paramedics are routinely exposed to acute stress during the course of their working day. This stress could increase the number of critical driving errors that occur. These results reinforce the need for further research, and highlight the potential need for increased driver training and stress management education in order to mitigate the frequency and severity of driving errors made by paramedics.

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A14.ISS. Even better than the real thing? Using video assisted structured reflection in Simulated Clinical Scenarios and Real-Life Clinical Experiences in the Flipped Classroom.

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Background: This paper explores the attitudes of practitioners to the use of video assisted structured reflection in simulated clinical scenarios and real-life clinical experiences in the context of a Flipped Classroom to encourage and support reflection and reflective practice among pre-hospital emergency care practitioners in Ireland. It also examines the experiences of practitioners who participated in this process. **Methodologies:** This paper is part of a larger project which consisted of three cycles of action research. Data was collected via an online survey questionnaire, and by conducting a series of semi-structured interviews with various stake-holders. These included all three clinical levels of pre-hospital emergency care practitioners and educators from emergency service providers, private ambulance services, and voluntary organisations. **Findings:** When combined, a simulation experience with audio-visual recording and a structured model of reflection in the context of a Flipped Classroom has become a powerful learning experience. The process of a simulation experience with audio-visual recording, and a structured model of reflection appears to dovetail very nicely with the concept of the Flipped Classroom. The review of footage from audio-visual recording in the real-life clinical context provides a reliable and accurate means of evaluating clinical performance. Concerns were raised about the potential for abuse and misuse of audio-visual recordings. There are perceptions that audio-visual footage of real-life clinical experiences could potentially be used for unintended purposes such as, disciplinary procedures. **Recommendations:** Since the process of combining a simulation experience with audio-visual recording and a structured model of reflection in the context of a Flipped Classroom has shown great promise as a learning experience, a larger scale pilot study is proposed. Develop a pilot programme with student practitioners during their undergraduate internship, and evaluate its findings. Develop a policy which clearly defines the use of audio-visual recording footage prior to the commencement of the pilot programme. A learning contract for all participants and faculty, including a confidentiality agreement, must be in place prior to the establishment of the process.

A15.ISS. Refusal to travel in the National Ambulance Service: A retrospective examination of calls from 2017.

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Introduction: When a member of the public calls for an ambulance through the 999/112 system, the only permitted course of action for the responding National Ambulance Service (NAS) staff is to convey the patient to an emergency department. Regardless of the clinical level, NAS staff do not have the authority or scope of practice to discharge the patient from the scene or make any other arrangements for the treatment of that person. (1) The patient, meeting certain criteria, can refuse treatment or transport (RTT) of their own volition. (1) Mortality rates for non-conveyed patients vary from 0.2%-3.5% within 24 hours and are twice those of patients discharged from an emergency department. (2, 3) In 2017, the refusal to travel rate in Ireland jumped from 7-8% of calls (2012-2014) to a national average of 11.3% (24,735) of total AS1 calls. (4) Although this level of non-conveyance would still be below international norms the rate of increase was concerning. (3) **Aim:** A quality improvement initiative necessitated identification of baseline RTT information. **Methods:** Retrospective data collection was conducted on all calls closed with a 'refusal to travel' or 'refusal of treatment' occurring between 1st Jan 2017 and 9th Nov 2017 and was gathered from the National Emergency Operations Centre (NEOC). **Results:** The top three dispatch classification that resulted in RTT were falls, unconsciousness or near fainting, and generally unwell patients. This was followed by chest pain, seizures, traffic incidents and breathing problems. It was noted that the time at which RTT calls occurred peaked nationally between 2000 and 2059. In the Southern area, peak RTT occurred between 2000-2059h and 0000-0100. 33.6% of RTT calls in the Southern Area were designated as Delta calls. This designation requires an advanced life support and a blue light response and is the call level with the second highest acuity below an Echo call, the designation for cardiac or respiratory arrest. **Conclusions:** The NAS specifically utilises a risk adverse triage system. Examination of dispatch priorities may be warranted. The peak close of RTT calls between 2000-2059 may align with a shift changeover at 2000. Further study is required.

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A16.ISS. Thermal variations in the patient compartment of an emergency ambulance: A feasibility study in an Irish context.

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Background: The unpredictability of the nature of the next call is a basic feature of Emergency Services; the call could vary from a trauma victim, to a hypothermic patient or a prehospital birth. All patients (other than those who are pyrexia) have in common the need for a warm environment to prevent deterioration in their condition. Multiple observation studies found that patients suffering from various levels of trauma, arrived in the Emergency Department with hypothermia. Hypothermia, a core temperature <35°C, affects multiple organ systems, and is associated with poor outcomes including death. Also, cold has been reported as negatively impacting the comfort of an ill or injured patient. It is currently assumed that the ambulance patient compartment's heater (*Air Top Evo 40, Webasto™, Gilching, Germany*), produces enough heat to offer thermal comfort and to help prevent further decrease of body temperature in the hypothermic patient. However, what is not clear is for how long and to what ambient temperature the ambulance's patient compartment needs to be heated, to provide the ambulance's furniture with sufficient stored energy to maintain the patient at an appropriate temperature for the duration of their transport to hospital. We consider how current practices and behaviours may need to be adapted to improve patient comfort and outcomes. **Objectives:** This study is to determine the feasibility of measuring and monitoring temperatures in a new generation Emergency Ambulance. The overarching objective, is to optimise patient comfort, outcome and prevention of hypothermia. **Methods:** Using thermocouples, a data logger and a thermal camera to record temperatures at strategic locations in the patient compartment, we recorded the variation of temperature in a typical new generation Emergency Ambulance compliant with the CEN-EN 1789:2007 standard. Thermal imaging and temperature logging studies were conducted on in May/July 2018. Temperature was logged for 24 hours. The locations examined were the stretcher mattress surface, low and high blanket storage lockers and the outdoor ambient air. The vehicle was located outdoor, facing west-north-west. **Anticipated outcome:** This study will provide us with data that can be used to improve patients' thermal comfort through behaviour and practice change. **Results:** The thermal camera images show a significant variation of surface temperature throughout the patient compartment. Preliminary temperature logging experiments show a measurable difference in temperatures at the areas of interest relative to the outside temperature over 24 hours. Some variations in rates of cooling and warming in each area have been observed during the cool – heat period; the stretcher mattress is the slowest to rewarm. **Conclusion:** The proposed method of measuring temperature variation in targeted locations in the patient compartment of a new generation ambulance proves efficient and could be used in further studies.

A17.ISS. Refusal to Travel in the National Ambulance Service. A Patient Care Report examination.

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Introduction: Every patient has the right to refuse treatment and, or transport (RTT) to hospital (1). The National Ambulance Service (NAS) has operated under a clinical guidance document that requires an assessment of patient capacity and a baseline amount of data to be gathered on every patient to facilitate the patient making an informed decision (2,3). An increase in the rate of non-conveyance of patients and refusal to travel calls as well as an increasing number of complaints prompted a quality improvement initiative based on improving and facilitating a shared decision-making model. **Aim:** For patients who RTT, to establish a baseline quality of information collected and recorded on a Patient Care Report. **Methods:** All NAS incidents closed with a refusal of treatment or transport, from 1st January 2017 to 9th November 2017 were identified from National Emergency Operation Centre (NEOC). A random selection of 75 patient care reports (52 paper and 23 electronic) were identified and reviewed. Compliance with the refusal to travel guidance document was measured. **Results:** 31% of paper PCR's reviewed were missing a complete set of vital signs. An average of 48.4 % (median 48.4%, range 36.5% to 61.5%) were missing a complete second set of vital signs. 17.3% of combined forms were missing the patient's chief complaint and 38.7% had no practitioner clinical impression entered. 24% had no capacity assessment completed. **Conclusion:** Clinical information recorded by NAS staff did not meet the clinical guidance document requirements. It is impossible to assess what information was given to a patient to facilitate a shared decision-making model. The quality of NAS documentation can be improved for patients who refuse to travel.

A18.ISS. Reflections on Reflective Practice among Pre-Hospital Emergency Care Practitioners in Ireland.

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Background: This paper examines the level of engagement of Irish pre-hospital emergency care practitioners with reflection and reflective practice. It also explores the attitudes of practitioners to reflection and to methodologies designed to support reflective practice such as reflective discussion and video-assisted structured reflection. Finally it outlines the main barriers to reflection, both individually and collaboratively, and reflective practice gaining widespread acceptance as key learning strategies among pre-hospital emergency care practitioners and educators in Ireland. **Methodologies:** This paper is part of a larger project which consisted of three cycles of action research. Data was collected via an online survey questionnaire, and by conducting a series of semi-structured interviews with various stakeholders. These included all three clinical levels of pre-hospital emergency care practitioners and educators from emergency service providers, private ambulance services, and voluntary organisations. **Findings:** Many practitioners consider themselves to be reflective practitioners. However, very few of them use a structured model of reflection. Reflection, and reflective practice are not part of the education standards for practitioners in Ireland, and consequently receive very little attention in most education programmes. Practitioners within voluntary organisations perceived that reflective practice was encouraged by their organisation in greater numbers than those from other organisations. Collaborative forums were perceived to be beneficial, although concerns were raised about their potential for abuse and misuse. These concerns appear to emanate from a lack of trust within certain organisations. **Recommendations:** Reflective practice to be included in the education standards for all levels of practitioners in Ireland. Develop and roll-out an education programme for existing practitioners regarding reflection, reflective learning, reflective practice, and structured models of reflection, as part of their CPC requirements. Provide education for all EMS course faculty regarding reflection, reflective learning, reflective practice, and structured models of reflection. A learning contract for all participants and faculty, including a confidentiality agreement, must be in place prior to the establishment of any collaborative forums. Further research to explore the reasons for lack of trust within organisations should be undertaken. Further research is recommended to explore the reasons for the disparity of opinion between volunteer and professional organisations regarding the encouragement of reflective practice.

A19.ISS. Is There A Role For Paramedics In Primary Care In Ireland: An Exploratory Study.

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Background: Paramedics are reported to be the most underutilised profession working within rural areas, due to the paucity of service requirements.(1) Infrequent opportunities to practice particular skills can lead to reduction in levels of confidence and competence that can have significant risk and safety ramifications for practitioners and patients.(2). Traditionally paramedic practice provides emergency care and transport within the community, but current ambulance service models within rural Ireland may be inefficient and contributing to hospital overcrowding and increased healthcare costs.(3) Alternative models of healthcare are implemented within alternative rural jurisdictions such as Australia and Canada that aims to address issues of practitioner underutilisation, skill retention and healthcare personnel shortages.(4) **Rationale:** Ireland's population is ageing, with increased co-morbidities and reports of current and predicted workforce shortages in general practice.(5) With rising demands on general practitioners (GPs), measures to increase their supply and retention has become a challenging problem. Potential solutions to this will require immediate change to established work practices, to cater for current and predicted healthcare needs. Paramedics with advanced skills (APs) could alleviate some of the shortages identified and enhance paramedic profile by transferring some tasks deemed appropriate from GPs to APs within both urban and rural communities. This process is globally known as task shifting where some competencies are transferred to alternative healthcare practitioners with less training. **Aim:** To ascertain the attitudes and opinions of paramedics and GPs associated with GEMS - UL, towards a new concept of joint collaboration in primary care that should be of mutual benefit to both groups, and also to identify potential barriers. **Methodology:** Questionnaire survey of graduate Paramedics and General Practitioners associated with University of Limerick Graduate Entry Medical School and Paramedic Studies to identify competencies that GPs would deem appropriate to reassign to APs and ascertain both groups' opinions towards this new concept of joint collaboration and practice. **Conclusion:** Studies report successful outcomes in similar models of joint collaboration to support shortages of GPs in rural healthcare. Collaboration on this scale has been shown to be beneficial for enhancing the paramedic profession within the wider healthcare system while providing essential support within primary care and general practice. Potential benefits have been reported with reduced emergency department admissions and early intervention in the management of chronic disease.

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A20.ISS. General Practitioners, Paramedics and the Primary Care Team; the Potential for Mutual Benefit.

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Background: General practice is entering a challenging phase. Increased workload and complexity with an increasing consultation rate is coming about as a result of an ageing population, extension of care that is free at the point of delivery to more people, and the trend to move routine care of chronic illness from secondary care to primary care.(1) This is all coming about at a time when the GP population is ageing and doctors graduating from GP training are choosing to emigrate or work part time.(2) It will be difficult to continue this work without changes to current practice. In the past nurses have been employed by GPs to help deliver care (3), however there is a shortage of nurses that challenges this model. It has been suggested that the unique skillset of Paramedics would complement those of GPs.(4) Various models of paramedics working primarily in primary care have been described. This practice of paramedics working with and under the guidance of GPs would be expected to have the benefit of keeping patients out of hospital and managed in the community . The skillsets of paramedics would be kept up by appropriate deployment in the community, especially in quieter country areas where their presence is necessary geographically for emergencies, but they do not get to practice their skills at an optimum rate. Barriers exist to such deployment but can be overcome resulting in a well-functioning PCT with good levels of interprofessional collaboration and generally positive effects.(5) Paramedics have shown a willingness to be engaged in such work.

Proposed methodology: Questionnaire survey of GPs associated with the UL GEMS (ULEARN) based on what skills they would use that would be shared by paramedics. Attitudinal study of GPs and paramedics on their attitudes towards this novel way of practice. **Anticipated outcomes:** GPs and paramedics have shown flexibility in the past. Literature review indicates that this is ongoing. It is anticipated that this would mean that respondents would attitudinally favour this move to make paramedic practitioners an integral part of the primary care team.

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**A21.EMSG.ISS Defining Mentorship in Prehospital Care:
A Qualitative Analysis of the Characteristics of
Prehospital Mentors**

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Introduction: This study sought to begin to define the current understanding of the term mentor within the prehospital environment (emergency medical services or EMS) as described by nomination letters written by mentees for a newly launched prehospital mentor award. *Methods:* The John Ross Paramedic Mentor Award was created in the fall of 2015 to recognize outstanding mentors in prehospital care. In the spring of 2016, nineteen nomination letters were received from registered prehospital professionals in Alberta detailing why their mentor should receive the mentor award. Written text from the nominations for this peer nominated award were analyzed using thematic and content analysis (n=19) to identify the current understanding of mentorship in EMS, desirable qualities of prehospital mentors, and what a successful mentoring relationship looks like in the prehospital environment from the perspective of mentees. Demographic data of the mentees and mentors were obtained. *Results:* Mentees and nominated mentors had varying years of experience, worked in diverse practice areas within prehospital care and represented varying scopes of practice (PCPs and ACPs). Three themes were identified from thematic analysis of the nomination letters 1) nominators seek to emulate their mentors, 2) mentors create a safe and nurturing environment, and 3) mentors act as advocates. In addition, content analysis was used to identify a number of desirable professional and personal traits of prehospital mentors. *Conclusion:* This study describes the qualities of prehospital mentors and identifies a number of common elements in a successful mentoring relationship (from the perspective of the mentee). These results highlight exceptional mentoring that is already occurring within the prehospital care environment. This research has the potential to provide guidance to those who aim to support both formal and informal mentoring within the prehospital care environment.