

SANGUINE



The Duty to Act in South African Law

An Approach to Spinal Immobilisation Decisions

Eight Rules for Creating Sound Assessments

Brief Extracts of Research Relevant to Pre-hospital Emergency Care



In this issue of *Sanguine* we cover a range of material, from an approach to spinal immobilisation, to medico-legal issues and, in the educational domain, eight “golden rules” for assessments. The review on duty to act, and how this is to be considered in the South African context is a great resource for all qualification levels; I hope it will be the first in a number of articles with a medico-legal focus as this is a fairly neglected area of our knowledge and practice. As usual, we also have brief reports of research by students and some interesting articles published in the international literature.

Please have a look under Society News too, as there is important information about the 2014 ECSSA conference. Save the date – we hope to see you at Maropeng in September next year.

Online CPD will be linked to the clinical article on spinal cord clearance and on the abovementioned review on duty to act. Make sure that you access this last questionnaire at www.ecssa.org.za to earn your CPD points.

I hope you find this issue interesting and, as always, we welcome any comments that you

may have on *Sanguine's* content or appearance. As we head into the final stretch of 2013, the *Sanguine* steering committee members would like to wish you a very happy festive season and a safe and prosperous new year. We will be back in the middle of 2014 with the first issue of *Sanguine's* fourth volume.

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Sanguine publishes newsworthy and professionally relevant articles of interest to all healthcare professionals working in the field of pre-hospital emergency care. The views expressed in *Sanguine* are not necessarily those of the Editor or ECSSA. Information related to the clinical assessment, diagnosis or treatment published in *Sanguine* should not be regarded as any form of guideline unless explicitly identified as such.

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Chris Stein
Editor



SANGUINE

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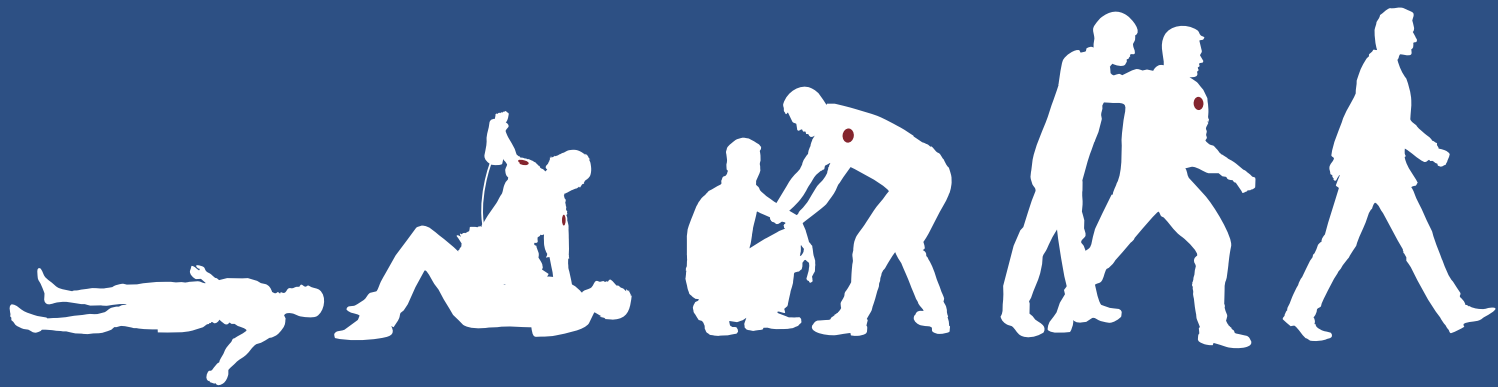
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SOCIETY NEWS

2014 ECSSA CONFERENCE

The ECSSA 2014 Conference is happening on 17-19 September 2014, in Johannesburg. The conference will be held at the

iconic Maropeng, in the Cradle of Humankind World Heritage Site just outside of Johannesburg. In keeping with the conference venue, the

theme of the conference is: **FIRST CONTACT TO FINAL OUTCOME: Evolution of Pre-hospital Emergency Care.**

What can you expect from ECSSA 2014?

- A reasonable fee, at R2,800.00 all-inclusive for registration on or before 20 August 2014, and R3,000.00 for registrations after this date. ECSSA members can register any time and pay R2,700.00. This makes ECSSA 2014 the best value-for-money conference on emergency care.
- A fantastic venue, with great conference facilities and a free tour of the exhibition at Maropeng with your registration.
- A conference programme dedicated to pre-hospital emergency care with a balanced mix of original scientific contributions, posters and talks on a wide spectrum of relevant topics across a range of care levels. From fluids to airway, paediatrics to triage, technology to law, systems to ethics and medical to trauma... ECSSA 2014 will provide you with the most relevant updates on current and best practice from a mix of local and international speakers.
- A choice of workshops to participate in, during the three days of the conference. These will focus on a mix of clinical and rescue skills. The best part is... the workshops are included in the conference registration fee - no extra payment.
- A chance to meet and network with colleagues: a cocktail evening

on the 17th September is included in the conference registration fee. There will also be a conference dinner on the evening of the 18th September (there will be an extra charge for this).

- And of course...CEUs (CPD points). If you are an ECSSA member the conference details will be added to your online CPD log and your certificate will be accessible from the ECSSA website.

Important dates:

Online Registration Opens:
5 January 2014
Online Abstract Submission
Opens: **5 January 2014**

What's next?:

Watch this space for updates and new information. As this becomes available it will be posted on the ECSSA website conference page (www.ecssa.org.za/conference.aspx). Also follow the ECSSA Twitter feed for updates ([www.twitter.com/@ECSSAZA](https://twitter.com/ECSSAZA); #ECSSA2014 for conference updates).

The Conference Organising Committee is Chris Stein, Ben van Nugteren, Andrew Makkink, Connor Hartnady and Willem Stassen.



SPECIAL INTEREST GROUPS ESTABLISHED

Three Special Interest Groups (SIGs) were launched in 2013. Information on these is given below. If you have an interest in any of these areas please contact the SIG leaders for more information.

Medico-Legal Practice in Pre-hospital Emergency Care SIG

This Special Interest Group (SIG) has been established with the fundamental aim of representing the medico-legal interests of the pre-hospital emergency care profession. Ethics in general have become a growing concern in medical practice across the board. Although this is indeed a positive development, it is needless to say that the prevalence of private lawsuits- and disciplinary inquiry processes by the Health Professions Council of South Africa (HPCSA) against registered health professionals is on the rise.

As the old saying goes” knowledge is power” and this in turn is a core objective of this SIG i.e. developing and providing training and education on the medico-legal aspects of pre-hospital emergency medical care. It goes one step further, as the SIG also intends to actually contribute to the development of improved legal guidelines that could create better legal certainty for emergency care workers facing ethical challenges in the practice of their profession. The latter approach is intended to minimise the number and extent of

“legal grey areas” that exist within the emergency care profession as a whole.

In addition to producing relevant opinions and position statements on current medico-legal issues in the field of emergency care, the SIG also plans to undertake specific campaigns to further its aim, goals and objectives in the interest of the South African EMS community. The following campaigns are being devised at the moment:

Tertiary Module (and supplementary courses) for Medico-legal Practice Campaign

This campaign involves the establishment of a collaborative platform between various Universities involved in emergency care training, together with Provincial Emergency Care Colleges, in order to devise a tertiary-level Module that is intended for inclusion on Bachelors

Degree/s and National Certificate courses in emergency care, such as B.Tech EMC; B.Hsc EMC; B.EMC and NC: EMC/ ECT respectively. The module will involve an in depth insight into the medico-legal aspects of emergency care in South Africa. For those practitioners not qualified

or training in the tertiary sphere, a separate course to be accredited and run by ECSSA will be developed according to the same content as the tertiary module, although not in the exact same depth.

Emergency Psychiatric Guidelines (EPG) for the Pre-Hospital Environment Campaign

This campaign involves cooperation with State health authorities across various levels, including Mental Health Review Board/s to develop a better framework for the treatment

and management of psychiatric emergencies in the pre-hospital environment. Once the campaign is formally launched, the ECSSA guidelines committee will be approached for further assistance on

clinical aspects of the proposed EPG.

For more information, contact the SIG leader Victor Voorendyk (medico-legal.sig@ecssa.org.za).



Quality and Informatics SIG

The Quality and Informatics SIG has as its focus two aspects of Emergency Medical Services (EMS) systems that are inextricably linked together: quality improvement and information management. Health care quality is difficult to define, but is generally concerned with the degree to which a health care system improves health outcomes and functions in a way that is in agreement with current professional practice. This SIG will initially concentrate on two important areas of quality, performance indicators and performance measurement, as well as clinical governance in EMS.

If the measurement of EMS system performance is crucial in steering efforts aimed at quality assessment and improvement, then clearly no serious attempt at either of these can succeed without a robust and reliable information management system. This applies to both operational information and clinical information, which together can provide the basis

necessary for appropriate levels of EMS control, quality and governance.

The objectives of the Quality and Informatics SIG are:

- To contribute to the development of a quality framework for Emergency Medical Services (EMS) in South Africa and to foster co-operation and information sharing in this area amongst EMS and other professional organisations involved in emergency care.
- To steer the process of clinical and operational data standardisation in South African EMS, and to contribute to the development of reliable and robust methods of clinical data collection, analysis and use for decision-making.
- To promote the need for a reliable set of performance indicators amongst the relevant decision-makers and stakeholders at a national EMS level.

- To promote the need for more organised, standardised and reliable forms of clinical and operational data definition, collection and use amongst the relevant decision-makers and stakeholders at a national EMS level.
- To contribute positively to the development of understanding in the areas of pre-hospital care quality and informatics (as outlined above) amongst the broader emergency care professional population through the provision of published material and presentations on relevant, related matters.

For more information, contact the SIG leader Chris Stein (president@ecssa.org.za).

Rescue SIG

The art and science of rescue is developing and progressing on a daily basis. Different scenarios, where victims need to be rescued, present themselves in the most creative and challenging ways imaginable. To be able to conduct a rescue proficiently demands a polished combination of knowledge, psychomotor skills and practical experience. Within the framework of knowledge lies the challenge for individuals to stay current and informed with regard to global best practises which are carefully integrated into the South African context. This SIG will invite

individuals with a keen interest in the developing world of rescue to join the group and share their knowledge and expertise, allowing topics to be debated, with the aim of ensuring that the next rescue is conducted in the best possible way.

The objectives of the Rescue SIG are:

- To debate rescue-related topics, teaching methodologies and initiatives and share different points of view in these areas.
- To share new product reviews and latest technology information and experiences.

- To comment on articles in rescue related journals and publications such as TRM, Park Ranger, Prehospital and Disaster Medicine.
- To share links to web based resources (videos, podcasts, webcasts, case reviews) and anything valuable from lessons learnt on real rescues.
- To suggest rescue-related research topics and sharing of research results.

ECSSA ANNUAL GENERAL MEETING

The ECSSA Annual General Meeting (AGM) was held in Cape Town on 6 November 2013. The meeting was well attended, with founding members of the first ECSSA Chapter (which is in Cape Town) present. The President's report detailed some achievements that had place in 2013:

- New additions to the Board of Directors;

- The establishment of a first Chapter and Special Interest Groups (as above);
- A Memorandum of Understanding to be signed with the College of Paramedics in the UK, establishing a speaker exchange programme among other things;
- Continued publication of Sanguine;

- Contributions made to the EMS Review Committee;
- ECSSA's strategic planning process;

No votes were taken for office bearer positions as the first of these reach the end of their term in 2014.



CLINICAL

PRE-HOSPITAL SPINAL CLEARANCE

Michael McCaul

Decisions about whether or not to fully immobilise trauma patients are made every day by paramedics in South Africa. Rules, algorithms and practices applied in the field to make these decisions appear to vary significantly, with little or no standardisation in teaching or application. International research in the area of decision rules and algorithms for pre-hospital spinal immobilisation can guide this area of practice as described below.

Introduction

A recent meta-analysis including 282,000 trauma patients estimated that up to 3,7% of patients present with cervical spinal injury. The incidence of spinal cord injury however is rare, but is markedly increased in patients with major head trauma.¹ As one would suspect, motor vehicle accidents account for the largest proportion of spinal injury, followed by falls and recreational vehicles.^{2,3} The clinical suspicion of spinal injury, especially in high velocity accidents or polytrauma patients is often overt and leaves little room for error. However, the unique challenges and risk is experienced by clinicians with patients where one is unsure of whether a spinal injury is present or not.

These situations are common and our individual judgements of whether to apply full spinal immobilisation or not are typically fraught with uncertainty. Full spine immobilisation is not a benign intervention, for if it were we would be immobilising everyone. Instead, full spinal immobilisation is known to cause various complications including skin ulcers, pain and aspiration. A recent Cochrane systematic review stated that full spinal immobilisation as an intervention remains uncertain as it has not been shown to improve mortality, neurological injury, spinal stability, adverse effects or patient associated outcomes.⁴

In South Africa, spinal clearance is being practiced ("spinal clearance" refers to application of a decision

rule in order to make an informed decision regarding the need for full spinal immobilisation). Paramedics appear to be using different kinds of spinal clearance rules and algorithms, with various degrees of reliability, which can lead to practice variation and introduce risk into this important decision-making process. Ultimately we may create more harm than benefit, as by following this approach we are quite likely to miss a potential spinal injury or immobilise anecdotally. A sensitive and reliable standardised diagnostic test to identify spinal injury should be used.⁵

When to Use Spinal Clearance

Spinal clearance should be used when there is clinical equipoise. In other words - when we are unsure whether there is spinal injury or not. Clearly if there are obvious signs

of a spinal injury then we should immobilise, or if the likelihood of spinal injury is very high such as in polytrauma cases, we should immobilise. However, when we have

a suspicion that the patient might have spinal injury we should apply a spinal clearance test. Most of these tests can only be applied to alert and stable patients.

What Test Should I Use and How Should I Use It?

A spinal clearance test has been developed for the South African pre-hospital setting that will hopefully one day be incorporated into the paramedic protocols (Figure 1). This test includes highly sensitive and established clinical decision rules such as the Canadian C-spine rule

and the NEXUS criteria. The decision rule starts with first applying and maintaining in-line immobilisation and monitoring/supporting care, then progresses to the clinical assessment phase. The first phase is adapted from the Canadian C-spine rule and revolves around indicators

that do not require physical touch. If any of these indicators are positive (a yes answer) then full spine immobilisation is indicated. As the likelihood of spinal injury increases dramatically if any of these indicators is positive. If the first phase is negative, we can proceed to the second 'clinical' phase assuming there is no major language barrier. Language is a unique challenge in South Africa as there is much room for interpretation error.

The second phase was adapted from the NEXUS rule and involves clinical indicators. If any of these are positive, immobilisation is warranted. The spinal assessment involves palpating for any deformity, abnormalities, pain or tenderness. It is vitally important to note where the pain or tenderness is, if it is not over the spine, but laterally next to the spine (on the muscle) then it is not necessarily a positive yield. This is a common mistake in the clinical assessment. Once all these indicators are negative, we can now proceed to the last step. This includes asking the patient if they can rotate their neck 90 degrees left and right. If so, and without pain or tenderness one can safely say there is no spinal injury and full immobilisation is not needed.

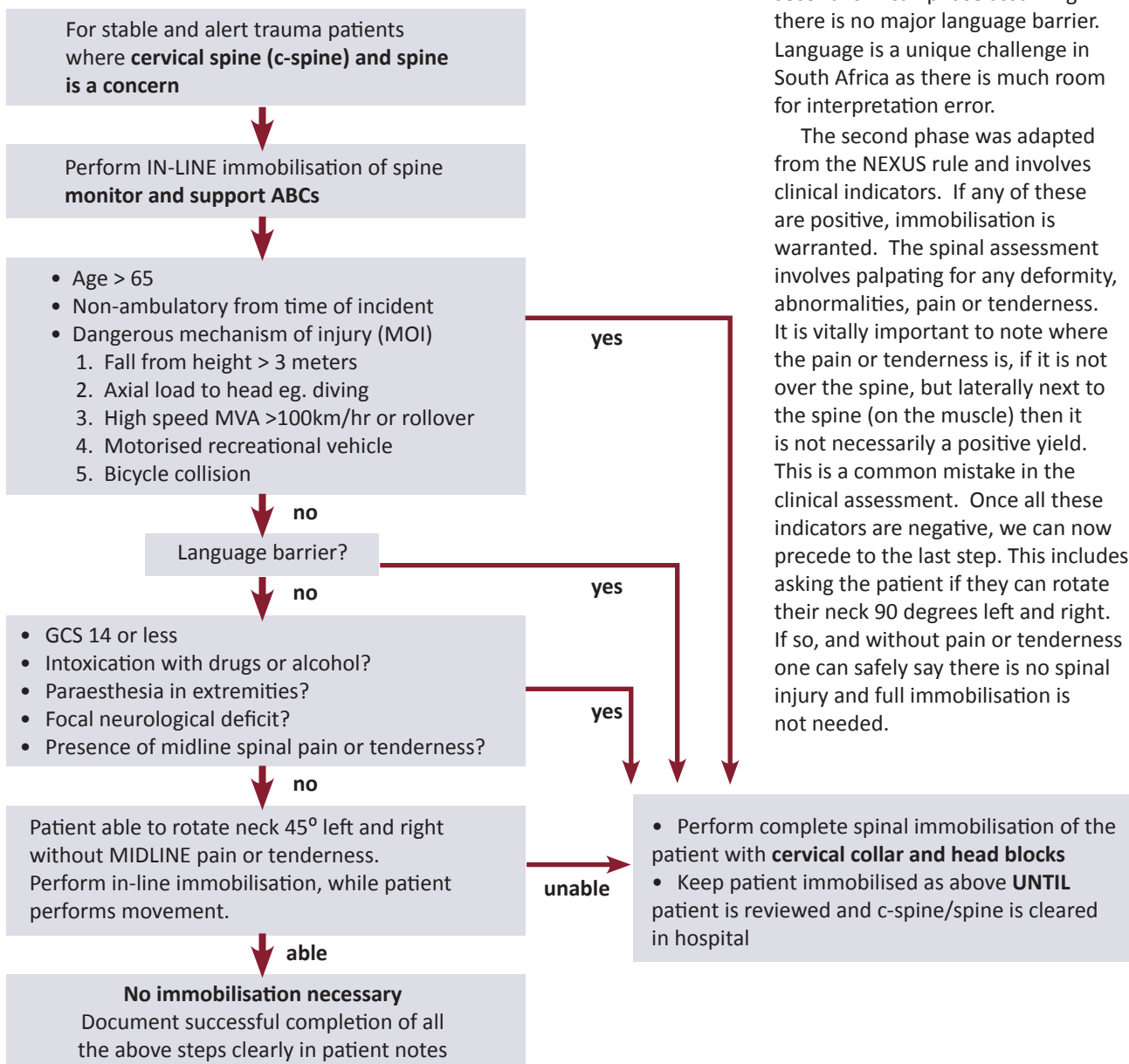


Figure 1: Adapted from M.McCaul spinal clearance algorithm for out-of hospital providers ⁵

How Safe is This Spinal Clearance Test?

A concept that is often misunderstood is that of test sensitivity and specificity. Sensitivity is the proportion of diseased (i.e. those with a disease, injury or disorder) with a positive test, while specificity is the proportion

of non-diseased with a negative test. Ideally, one would want both of these measures to be 100%, this is not always possible. In the case of spinal injury, we want to be very sure that when a test is negative it is truly negative. For this we require

very safe to use, as when it is negative, one can be very sure it is truly negative.⁶

a good sensitivity value (ideally >95%). The proposed South African spinal clearance algorithm has been adapted from highly sensitive tests (>99%) which can give the clinician a sure foothold to stand on when the test is negative. The test is thus

Conclusion

Spinal clearance is a valuable tool that all non-supervised paramedics should practice both for the benefit of their patients and to alleviate the burden of unnecessary immobilisation. A validated standardized spinal

clearance algorithm should be used across South Africa by suitably qualified health professionals working in the pre-hospital setting.

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The information and algorithm appearing in this article are not intended to be used as a practice guideline. Registered emergency care personnel must direct their practice in line with current guidelines, protocols or other operating procedures as required.



REVIEW

THE EMERGENCY MEDICAL SERVICE WORKER'S LEGAL DUTY TO ACT IN THE CONTEXT OF SOUTH AFRICAN LAW

Victor Voorendyk

Of the many fundamental legal questions related to the practice of pre-hospital emergency care, the nature of a duty to act is one of the most important with far-reaching consequences for both the Emergency Medical Services worker and the patient. The legal basis of this duty, how it applies, to whom and under which circumstances are explored in this review which is applicable to all Emergency Medical Services workers regardless of qualification or scope of practice.

Introduction

It is practically impossible to divorce law from the practice of medicine and pre-hospital emergency medical care certainly is no exception. Each and every decision taken in the pre-hospital environment by any category of emergency care worker has a definite legal implication; whether that decision is simply to touch a patient for the purposes of assessment or whether it is to induce apnoea through the administration of anaesthetic medications with the aim of securing an advanced airway. The reality quite simply stated is that law underlies our every interaction in the execution of a professional duty of care towards patients as Emergency Medical Services (EMS) workers.

The teaching of medical law and ethics in the diverse range of South African emergency care courses seems to be a developing practice. Commonly used literature includes books such as Mosby's Paramedic Textbook and of course the ever-popular Nancy Caroline range of textbooks. These EMS-bibles so to speak reflect in depth what the legal position towards pre-hospital emergency medical care entails across the length and breadth of the United States of America; however, with pre-hospital emergency care being a comparatively new specialist profession in the context of South Africa, it is unsurprising really that there has not been extensive legal educational development that relates

to our own country and systems. Although medical-ethical concepts such as patient abandonment, consent and even that of the duty to act itself are quite universal, there is a degree of interpretation that surrounds these concepts warranting a more focused domestic analysis.

This review is intended to take one of these medical-ethical concepts – being the legal duty to act – and cast it in the light of South African law with the objective of growing the reader's understanding of the emergency care worker's legal duty to act as it applies within the Republic of South Africa. The review will commence with a theoretical overview of the concept of a duty to act before progressing to a discussion

on the sources of a legal duty to act in South African law and also the right not to be refused emergency medical treatment. It concludes with a practical evaluation of the legal duty to act in relation to a South African case study.

The aim of this review is not to propose a conclusive answer to the question of when an emergency care worker should or should not act, but rather to provide an analytical overview of the legal position in

South Africa that may serve as a guideline in the decision-making process where emergency care workers are confronted with ethical dilemmas in the field relating to this topic.

Theoretical Overview of the Concept: “Duty To Act”

According to the Oxford English Dictionary, the term “duty” denotes a moral or legal obligation or alternatively refers to the idea of having a degree of responsibility [towards someone or something].¹

As many people might agree though: the law itself is not so simple.² There are a variety of theories underlying the art of legal interpretation and as such coming to a final, legally acceptable definition of the term duty is already difficult enough – let alone deciding accurately on when such a duty actually even exists.

Before delving into any complex legal theory, suffice it to say that looking simply at the dictionary meaning of the word duty two important elements of this concept immediately stand out, namely obligation and responsibility.

On the one hand as the dictionary definition of the term duty suggests, the source of an obligation is generally a conviction of some kind based on law or morality. It could thus be asked, firstly, whether our

duty to act towards patients as EMS workers stems from either law or morality.

The law is a set of norms (i.e. rules) and standards that regulates human conduct within society and which is used furthermore to distinguish between good and bad and more so to separate right from wrong. Morality on the other hand is an enormously broad philosophical concept which boils down to an individual’s ideal self-image or ultimate virtues. Individual morality can also be distinguished from collective morals (community mores) which refer to the norms of a whole community or group within that community.³ Whilst the debate of law versus morality is as old as jurisprudence itself, it should be accepted for purposes of this review that there is indeed a distinction between these two concepts.

It may be conceded that personal moral compulsion will certainly drive some of us as human beings to act in a number of circumstances that may present within the pre-hospital

field (thereby meeting the moral duty to act). It therefore becomes necessary to limit the question posed above specifically to establish when a duty arises in law, rather than out of personal moral conviction. It is important to take into consideration the fact that law is a very broad field of study with a multitude of different sources – practically each of which in turn may be the potential source of a legal, rather than moral, duty to act in a given situation.

On the other hand – referring once again to the dictionary definition of the term duty – the concept or element of responsibility involves being liable to be called to account for one’s conduct. In this review we are thus ultimately concerned with the question of when the EMS worker is legally obliged (rather than morally compelled) to act in respect of a person (“the patient”) facing a medical emergency, with the necessary degree of responsibility.

The Legal Duty to Act Under South African Law

Sources of Law versus Classification of Law

There is a difference between Sources of Law and Classification of Law. Classification of Law refers to the manner in which the legal system is structured and set out into different branches of law and areas of legal practice; whereas Sources of Law refers to the specific places from which our law originates and where it can be found, namely: the Constitution; legislation; legal precedent; common law; customary law; indigenous law and writings of modern authors.⁴

Kleyn and Viljoen propose a classification structure⁵ whereby

the law is divided into International- and National Law – the latter being the law as it applies domestically in South Africa. National Law is then split into Adjective- and Substantive Law, where Adjective Law deals with the procedural aspects of legal practice through which Substantive Law is enforced and Substantive Law determines the content and meaning of different legal rules and principles within the Republic. Substantive Law itself is divided into Public Law – where we find the practice areas of Criminal- and Constitutional Law most notably amongst others – as well as Private Law in which we find the Law of Delict included (the Law

of Delict is the specific field of law concerned with disputes between two persons where one party has caused damages to another, for example through the negligent practice of medicine or emergency care in our case).

Criminal versus Delictual Liability

Depending on the specific facts, merits and cause of action in a given case, an EMS worker could in theory be held liable for medical negligence or more specifically also for failing to act where he or she was subject to a legal duty to act under either Public (criminal) - or Private (delict) Law.

The concept of a legal duty to act features most prominently in Criminal Law and the Law of Delict. There is extensive overlap between these two fields when it comes to the concept of a legal duty to act and as such the discussion that follows shall be presented with reference to both these fields of law in a collective manner. For clarity, where an emergency care worker breaches his or her legal duty to act in the context of Criminal Law the conduct will be unlawful. In terms of the Law of Delict, the same conduct will be wrongful.

Consent and Necessity as the Basis for Intervening in a Medical Emergency

Generally speaking, consent may be regarded as the legal basis of a medical intervention.⁶ It implies that a patient in need of some form of health service voluntarily seeks and accepts medical care offered by a health worker or doctor. This basis of intervention relates closely to the concept of patient autonomy, which ultimately provides when a health worker is permitted to render a medical intervention to the patient.

The question of a legal duty to act on the converse refers rather to a situation where the health worker becomes legally obligated to render a medical service to the patient who is unable to give consent for some or other reason such as

unconsciousness, impaired mental functioning or legal incapacity to name a few.

General Criterion Providing For a Legal Duty to Act

It is at this stage that the sources of law referred to above become significantly relevant. The Constitutional and legislative sources discussed below are rather clear cut; but there is one particular common law source in which the legal duty to act is found that is of the utmost importance in determining whether a person has or had a legal duty to act. This is known as *boni mores* – a concept in law referring to the legal convictions of society (that is to say the norms and values of the community within which we live).

Boni mores, or rather the legal convictions of society, are regarded as a general norm or criterion to be employed in determining whether a particular infringement of another's interests is unlawful.⁷ In cases of liability for an omission though, wrongfulness is normally determined by asking whether – according to the legal convictions of society – the defendant could reasonably have been expected to act positively in order to avert harm, rather than asking whether the plaintiff's subjective right has been infringed.⁸ This is done by measuring whether the conduct of a person supposedly at fault was reasonable

or not against what society might expect of that person in the situation at the time of the alleged breach of duty. If it is found that the emergency care worker indeed had a legal duty to act, which was breached unreasonably in the absence of any grounds of justification, his or her conduct would be wrongful [and/or unlawful].

It is interesting to note that whilst personal moral convictions will not necessarily have any legal bearing on a given situation in the field, the collective moral convictions of the community form a prominent criterion for the determination and establishment of legal interests.

More on Liability for an Omission

Where an EMS worker refuses to act in the presence of a legal duty it can be said that an omission (i.e. a failure to act positively) has occurred.

Where the EMS worker fails to act on account of a personal moral conviction or alternatively where the failure to act is in breach of a personal moral duty to act, it may be stated generally that he or she would not incur criminal or delictual liability merely on the ground of that personal moral conviction;⁹ but in terms of the decision in *Minister van Polisie v Ewels*¹⁰ it can safely be said that where a person who could reasonably be expected to intervene in certain circumstances – such as a



paramedic with an apnoeic patient in the pre-hospital environment – fails to act in the light of a vested legal duty to act, he or she would surely incur criminal or delictual liability.

Other Sources of a Legal Duty to Act

In addition to the legal convictions of society, there are a few other sources of a legal duty to act within our common law that deserve mentioning before proceeding to a discussion on the more modern statutory sources. The first is prior conduct, where a person creates a new source of danger and subsequently fails to eliminate the danger resulting in harm to another person. A simple illustration in the EMS context might be where a paramedic intubates a patient requiring assisted ventilation and subsequently fails to ensure that the placement of the endotracheal tube (ETT) remains at the correct depth with the result that the tube is displaced and harm is inflicted upon the patient. The placement of an ETT is potentially dangerous and the paramedic passing the ETT thus has a legal duty to ensure that the tube remains correctly in place until handover.

Secondly, where a person accepts control over a dangerous object, a duty arises to exercise proper control over it. To illustrate: an ALS paramedic is issued with morphine – a scheduled analgesic drug. He administers morphine to a patient that has been traumatically injured in a motor vehicle collision and who is about to be removed from the scene by ambulance. Following drug administration, the paramedic leaves a BLS paramedic in charge of the patient, together with his drug bag in the back of the ambulance. En route to hospital the patient complains of pain and the basic ambulance assistant decides to administer more morphine by drawing up the drug taken out of the drug bag and injecting the medication into the patient's intravenous line. The patient goes into respiratory arrest and suffers severe hypoxic brain damage as a result. In this case, morphine (being a dangerous substance) is issued to the ALS

practitioner who is charged with the duty of care and control over the drug. Although the basic ambulance assistant himself would face legal consequences, the paramedic would also be liable for failing to exercise care over a dangerous object in relation to which he accepted control.

Thirdly, certain rules of law may impose a direct duty on a health worker to respond according to expectations placed on him or her by those rules of law. Fourthly, a duty may be created by virtue of a special relationship (such as a contract or agreement) between the EMS worker and a patient, for example where a non-life threatening emergency case is still transported by EMS, the attending personnel remain responsible for the patient who submitted him- or herself voluntarily to their care. The list of sources in this regard is not final by any means and there is a wide range of factors in interplay with one another to be mindful of, each of which in itself may create a legal duty upon the emergency care worker.

Statutory Sources Creating a Legal Duty to Act and the Right to Emergency Treatment

We now arrive at one of the most fundamental parts of modern South African health law, being the effect of the Constitution on the provision of health services. As is clearly indicated in Section 2, the Constitution "*is the supreme law of the Republic [and any] law or conduct inconsistent with it is invalid, and the obligations imposed by it must be fulfilled*".¹¹ Section 27(3) of the Constitution provides that "*no one may be refused emergency medical treatment*."

The right to be provided with emergency medical care is therefore constitutionally entrenched and in order to advance this right, Section 5 of the National Health Act 61 of 2003 echoes the same sentiment reflected in Section 27 (3) of the Constitution. It is clear that the Constitution and the National Health Act are statutory sources of law, both of which create an absolute duty on health workers of all kinds to provide emergency treatment to those persons facing a medical emergency.

The *Constitutional Court in Soobramoney v Minister of Health (Kwa-Zulu Natal)*¹² held that the right not to be refused emergency medical treatment implies that a person who suffers a sudden catastrophe, which calls for immediate medical attention, should not be refused ambulance or other emergency services which are available and should not be turned away from a hospital which is able to provide the necessary treatment. Most importantly, the court provided that "there is some suddenness and at times even an element of unexpectedness in the concept 'emergency medical treatment'".

The Potentially Varying Extent of the EMS Worker's Legal Duty to Act

It appears from practice in EMS operations that there is often some difficulty in balancing a patient's right to emergency medical treatment with the practitioner's duty to act in relation to a particular patient's specific situation.

A patient may request EMS assistance only for attending personnel to find that in fact there is no urgency nor any immediate threat to the patient's health or life in that particular case. EMS workers apparently tend to experience some uncertainty when dealing with non-emergency cases¹³ and the question could well be posed whether EMS workers still have the same extent of a legal duty towards a non-emergency cases as they may have towards a patient in true peril as the Constitutional Court envisioned in its *Soobramoney* judgment.

Dealing with cases that are of a non-emergency nature in the pre-hospital environment has been identified as a definite source of on-the-job stress for EMS workers.¹⁴ However it seems as if there is some advancement in terms of these concerns in that ALS paramedics are now able to discharge patients on scene¹⁵ with the result of terminating the patient-practitioner relationship.

It is important to keep in mind, however, that such an on-scene discharge or in fact even the advancement of a refusal of care decision (RHT) by the patient will not

necessarily eliminate the emergency care worker's legal duty to act as such. Should the patient's condition deteriorate to an extent where his or her life becomes endangered and the situation thus becomes a true medical emergency, the EMS worker must act without doubt. The importance of thorough patient assessment and documentation in this regard cannot be over-emphasised.

A Practical Evaluation of the Legal Duty to Act

In September 2004, an ambulance crew under the employ of a large South African metropolitan EMS agency was dispatched to a medical incident involving a vagrant who was found seated in the street gutter. According to news reports, the attending EMS workers failed to assess the patient and they merely assisted him out of the road and onto the pavement, supposedly refusing to transport the man because he was "too dirty and stank".¹⁶ The EMS workers were found guilty of misconduct and were dismissed from the service.

In the above case a multitude of ethical questions spring to mind. Most importantly though as far as this review is concerned; the matter begs the question of whether the EMS workers involved were in breach of a legal duty to act towards the patient. It could be dangerous to make a superficial assessment of a complex situation such as this, because a variety of factors will have an impact on the final outcome or verdict as far as the implicated personnel are concerned. As such our focus here will be limited only to the question of the EMS workers' duty to act.

With the exception of the alternative sources of a legal duty to act referred to above, the most appropriate point of departure in determining firstly, whether a legal duty to act existed and secondly

whether it was in fact breached would be to measure the conduct of the EMS workers against the reasonable convictions of society (*boni mores*). Similar to negligence, the assessment therefore comes down to a test of reasonableness.

There is no question that this particular patient had the right not to be refused emergency medical treatment, but this is where the case becomes complicated: News reports state that the patient died less than sixteen hours following the arrival and departure of the EMS personnel – a relatively long time to survive an acute and supposedly life threatening medical emergency, keeping in mind that according to the *Soobramoney* case an emergency for purposes of the right under Section 27(3) entails an element of suddenness [and/or urgency] and sometimes unexpectedness.

Had the patient been in current danger or mortal peril at the time of their arrival the EMS workers would be required to act then and there without question and transport the patient to an appropriate facility. Based on a liberal interpretation of the available information though, it seems as if the patient was potentially only ill and developed a true state of emergency quite some time after the EMS attendance. Had a proper assessment been completed on scene and no irregularities in the patient's condition at the time of assessment had been found, we are left to wonder whether or not the EMS workers could possibly have escaped liability. Once again the importance of thorough assessment and documentation must be stressed.

In terms of a more realistic assessment of this case study, however, it is probably fair to conclude that the EMS workers in question did indeed breach their legal duty to act towards the patient when measuring their conduct against the reasonable

convictions of society (*boni mores*). The community expects that trained health care workers will at the very least adequately assess a patient and make an informed decision as to the most appropriate steps to take in promoting the patient's healthcare interests and well-being. In this regard there was hardly any assessment conducted and there is no evidence to suggest that the patient himself refused the care that should have been provided in this case.

Conclusion

The test for reasonableness according to the legal convictions of society is purely objective and entails that all the relevant factors and circumstances of a particular case must be taken into consideration when determining whether the conduct of an alleged wrongdoer was actually wrongful or unlawful.

The conduct of an EMS worker will be wrongful and/or unlawful where he or she has a duty to act towards a patient according to the legal convictions of society and he or she fails to live up to that duty. In this regard though, the Constitutional dispensation under which our modern society now functions must be taken into account in that the assessment of a supposed wrongdoer's conduct must be made in light of the spirit and purport of the Bill of Rights.

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EDUCATION

ASSESSMENT: A SHORT GUIDE FOR STUDENTS, ASSESSORS AND ASSESSMENT DESIGNERS

Stuart Hackland

Assessment is a crucial component of the education process, both for the purposes of feedback and for the purposes of documenting knowledge skills and attitudes. In order for any assessment to play a constructive role in learning, or in providing evidence that learning has occurred, it should comply with eight fundamental quality attributes.

Assessment of a student's clinical knowledge and practical competence is one of the pillars of emergency medical care education. It is essential that the performance of the student, as well as the incorporation of theoretical content delivered over the span of the course, be assessed on an ongoing basis. A critical comparison of the benefits and shortfalls of formative versus summative assessment falls outside of the scope of this article, but suffice to say that formative evaluation allows the course coordinator, and indeed the students themselves, to identify areas of weakness that require additional development, while summative assessment provides the evidence to satisfy the knowledge and competency requirements of the Health Professions Council of South Africa (HPCSA) in order to register as an emergency care worker.

This guide seeks to remind assessment-designers of the principles of a good assessment,

enlighten those professionals who are occasionally enlisted as external examiners, and equip learners to understand the basics of assessment design.

The fundamentals of a good assessment design are validity, reliability, transparency, fairness, consistency, practicability and currency.

Validity is the foremost aim when designing any assessment. Validity, in its simplest definition, is ensuring that the assessment tool actually measures what it is supposed to measure. Using a written test to assess a student's understanding of the indications for intubation would be a simple example of a valid test of the student's knowledge, but getting them to write about the process of intubation would not be a valid way of confirming competence in the skill of intubating. There must be congruence between what the test hopes to measure and how it measures it.

Reliability means that different assessors would arrive at the same result under identical circumstances. This relies on ensuring that the marking criteria and tools are objectively structured, and that assessors understand how to use them.

Transparency is ensured when all parties involved in the assessment, namely instructors, students and assessors, receive clear, accurate and timely information on the assessment process and procedures. Is the purpose of the assessment understood? Are the rules around it understood? Are there any queries and concerns? These should obviously be dealt with well in advance to the start of the assessment.

Fairness ensures that the assessment does not pose any barriers to achievement, which are not related to the outcome at hand. For example, if an assessment's outcome is to troubleshoot a faulty

electrocardiograph (ECG) monitor, then the scenario would pose a relevant situation to allow the student to do so. However, if the outcome is to manage a symptomatic bradyarrhythmia, then it would be unfair to expect the student to first have to troubleshoot the ECG monitor before being able to manage the bradyarrhythmia.

Closely linked to fairness is consistency, where the assessment is conducted in identical circumstances for all students. Thus, any deviations in results would solely reflect the student's response to the information given or the limitations of their skill/knowledge.

Practicability asks whether the student can complete the task

within the set amount of time, with the resources provided, and is assessed at the correct performance/knowledge level for the student?

Currency of evidence is important for assessments like portfolios of evidence or signed off skills. The assessment criteria should clearly state the maximum age of evidence before it is deemed inadmissible. Concerning evidence, two more principles are worth mentioning: Authenticity and Sufficiency. Authenticity is concerned with who has produced the evidence. Obviously in a proctored written exam or skills assessment, there is no doubt who has produced the evidence of learning, but in portfolio and assignment-based work, it is less easy to say so. Safeguards need to be

built into the assessment to ensure that it is the student who produces the evidence. Sufficiency ensures that all assessment criteria have been met, and that the performance can be repeated consistently in the future. It is acceptable for the assessor to request additional evidence to satisfy all criteria.

A well-developed assessment offers the benefits of allowing students to demonstrate their knowledge and skills attained from an educational program, while being straightforward to use for external examiners. Such assessments take time and energy to formulate, but run more smoothly and yield fewer appeals against the assessment results – a worthy objective.

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COCHRANE CORNER

Michael McCaul and Tamara Credo

The Cochrane Collaboration was founded by Sir Iain Chalmers in Oxford 20 years ago. It has established itself as an international not-for-profit organisation which aims to help people make well-informed decisions about healthcare by preparing, maintaining and promoting the accessibility of systematic reviews of the effects of health care interventions. The collaboration now includes approximately 28,000 contributors from across the globe recognised as setting the gold standard of high quality intervention systematic reviews. Cochrane Corner focuses on one of these reviews relevant to pre-hospital emergency care in each issue.



Effectiveness of the Valsalva Manoeuvre for Reversion of Supraventricular Tachycardia

Smith GD, Dyson K, Taylor D, Morgans A, Cantwell K

This Abstract is taken from a Cochrane Review previously published in the Cochrane Database of Systematic Reviews 2013, Issue 3. Art. No.: CD009502. DOI: 10.1002/14651858.CD009502.pub2. (see www.thecochranelibrary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and Cochrane Database of Systematic Reviews should be consulted for the most recent version of the review.

Background

Patients with supraventricular tachycardia (SVT) frequently present to clinicians in the prehospital and emergency medicine settings. Restoring sinus rhythm by terminating the SVT involves increasing the refractoriness of AV nodal tissue within the myocardium by means of vagal manoeuvres, pharmacological agents or electrical cardioversion. A commonly used first-line technique to restore the normal sinus rhythm (reversion) is the Valsalva Manoeuvre (VM). This is a non-invasive means of increasing myocardial refractoriness by increasing intrathoracic pressure for a brief period, thus stimulating baroreceptor activity in the aortic arch and carotid bodies, resulting in increased parasympathetic (vagus nerve) tone.

Objectives

To assess the evidence of effectiveness of the Valsalva Manoeuvre in terminating supraventricular tachycardia.

Search Methods

We electronically searched the Cochrane Central Register of Controlled Trials (CENTRAL) in The Cochrane Library (Issue 1 of 12, 2012); MEDLINE Ovid (1946 to January 2012); EMBASE Ovid (1947 to January 2012); Web of Science (1970 to 27 January 2012); and BIOSIS Previews (1969 to 27 January 2012). Trials registries, the Index to Theses and the bibliographies of all relevant publications identified by these strategies were also checked.

Selection Criteria

We included all randomised controlled trials (RCTs) that examined the effectiveness of the Valsalva Manoeuvre in terminating SVT.

Data Collection and Analysis

Two authors independently extracted the data using a standardised form. Each trial was assessed for internal validity with differences resolved by discussion. Data were then extracted and entered into Review Manager 5.1 (RevMan).

Main Results

We identified three randomised controlled trials including 316 participants. All three studies compared the effectiveness of VM in reverting SVT with that of other vagal manoeuvres in a cross-over design. Two studies induced SVT within a controlled laboratory environment. Participants had ceased all medications prior to engaging in these studies. The third study reported on patients presenting to a hospital emergency department with an episode of SVT. These patients were not controlled for medications or other factors prior to intervention.

The two laboratory studies demonstrated reversion rates of 45.9% and 54.3%, whilst the clinical study demonstrated reversion success of 19.4%. This discrepancy

may be due to methodological differences between studies, the effect of induced SVT versus spontaneous episodic SVT, and participant factors such as medications and co-morbidities. We were unable to assess any of these factors further, nor adverse effects, since they were either not described in enough detail or not reported at all. Statistical pooling was not possible due to heterogeneity between the included studies.

Authors' Conclusions

We did not find sufficient evidence to support or refute the effectiveness of the Valsalva Manoeuvre for termination of SVT. Further research is needed and this should include a standardised approach to performance technique and methodology

Plain Language Summary

SVT is a common heart abnormality which presents as a fast heart rate. This heart rhythm disturbance can occur in healthy individuals and may include symptoms such as chest pain, palpitations, shortness of breath, sweating and feeling faint. In rarer instances, unconsciousness may occur. The treatment of this condition is usually a combination of physical straining manoeuvres (also known as vagal manoeuvres), medications or electrical therapy (used in severe cases where blood pressure drops to a low level). A vagal manoeuvre is a term used to describe any physical intervention which results in stimulation of the tenth cranial nerve (vagus nerve), which in turn can lead to slowing of the heart rate in the setting of SVT. One such manoeuvre, the Valsalva Manoeuvre, is performed by having a patient blow into a syringe whilst lying down (face up) for fifteen seconds. This generates increased pressure within the chest cavity and triggers a slowing of heart rate which may stop the abnormal rhythm. This review

examined the evidence available to see how effective the Valsalva Manoeuvre is in restoring normal heart rate (known as reversion success).

Three studies involving a total of 316 participants were included in this review. Analysis of the results showed that reversion success lies somewhere between 19.4% and 54.3%. The likelihood and severity of side effects (adverse events) could not be calculated as the studies provided insufficient information to perform this analysis. Potential side effects have been reported in other articles on the subject: these have included hypotension (sudden lowering of blood pressure) or syncope (brief loss of consciousness). No side effects were reported in the three studies reviewed here. Within the three studies reversion was achieved on completion of each Valsalva Manoeuvre.

Overall, the Valsalva Manoeuvre appears to be a simple, non-invasive method of stopping abnormal heart rhythm but its safety and overall effectiveness are difficult to quantify. Further research is required to improve the evidence surrounding this practice.

Implications for South African Paramedic Practice

In current South African paramedic advanced life support practice, the Valsalva Manoeuvre is recommended as an adjunct therapy in patients presenting with stable supra-ventricular tachycardia. In light of this Cochrane systematic review the Valsalva Manoeuvre does not cause unnecessary harm to patients and is an easy to apply, non-invasive method with a up to 54% chance of ceasing supra-ventricular tachycardia when applied. Applying the Valsalva Manoeuvre is a safe first line measure for attempting to cease supra-ventricular tachycardia in haemodynamically stable patients, the effectiveness has not yet been established.

Acknowledgements

The section editors would like to thank the South African Cochrane Centre and the Cochrane Pre-hospital and Emergency Care Field for their support. For more information on Cochrane systematic reviews please visit the Cochrane Library (www.thecochranelibrary.com)

Michael McCaul is a clinical epidemiologist and Emergency Care Practitioner. Currently completing a degree in statistics at Stellenbosch University, Michael is passionate about advancing research within the emergency care setting.





STUDENT RESEARCH REVIEW

The following brief extracts are a selection of research projects completed by students at Bachelors level, in the last three to six months.

THE FEASIBILITY OF ULTRASOUND IN SOUTH AFRICAN PREHOSPITAL EMERGENCY CARE

Student: Giselle Bester
Supervisor: Christopher Stein

Department of Emergency Medical Care University of Johannesburg

Pre-hospital emergency ultrasound (PEUS) use has been expanded to that of non-physicians and non-radiologists in Germany, France, Italy, United States of America (USA), Australia and the Military. Its use in South Africa is limited to the Emergency Department. The usefulness of PEUS in the South African pre-hospital environment has not yet been established. Investigating PEUS's feasibility may assist in decision-making regarding implementation and training. This study was aimed at investigating the feasibility of ultrasound in the pre-hospital emergency care environment in South Africa.

The Delphi Research Technique was used to conduct this prospective, observational study. This involved the formation of an expert panel consisting of registered medical practitioners who were accredited emergency ultrasound providers or trainers. Consenting participants

were asked to complete an anonymous online survey. Answers for each statement were collected, and interpreted quantitatively to determine the degree of similarity among answers. Statements with a similarity of 75% or more considered to have achieved consensus. A minimum of six participants had to complete at least two rounds of the survey.

Only 30% out of all prospective participants consented to taking part in the study, and 26% completed both rounds of the survey by the commencement of data analyses. None of the 19 questionnaire items in the first round achieved consensus. After the second round however, eight statements achieved consensus. All of the participants agreed that focused abdominal sonography in trauma (FAST) should not be excluded in cases where transportation to the receiving facility is prolonged while 83% agreed that pre-hospital identification

of abdominal aortic aneurysm/ dissection via PEUS could improve decision making and patient care. All of the participants agreed that PEUS could improve decision making and patient care during resuscitation in cardiac arrest while 83% agreed that PEUS may allow more appropriate decisions regarding transfer.

All of the participants agreed that non-physicians can be trained to perform PEUS accurately and reliably. According to most of the participants, PEUS training should be limited to advanced life support providers. Similarly, most participants agreed that PEUS training should be included in course work for qualifications where it is deemed appropriate. Other questionnaire items had very low similarity values, and collectively indicated that PEUS is not currently feasible in South Africa, regarding specific indications/uses. Currently, it does not seem feasible to implement PEUS in South Africa for only two specific indications.

SOUTH AFRICAN PARAMEDIC'S EXPERIENCES OF FINANCIAL MEDICINE PRACTICES

Student: Richard-Kyle Jackson
Supervisors: Craig Lambert

Department of Emergency Medical Care University of Johannesburg

The term “financial medicine” refers to the delivery of health-related services where the generation of financial gain or “profit” takes precedence over the provision of evidence-based emergency care. The practicing of financial medicine includes over-servicing and overbilling, both of which have led to a sharp rise in the cost of health care and medical insurance in South Africa. For this reason, the practice of financial medicine has been widely condemned by the Health Professions Council of South Africa (HPCSA) and allied Professional bodies. This exploratory qualitative study aimed to investigate and describe the experiences of South

African Paramedics with regard to the practice of financial medicine in the local pre-hospital emergency care environment.

Six South African paramedics were interviewed to explore, document and describe their experiences with regard to financial medicine practices in the pre-hospital emergency care environment. It emerged that all of the participants had experienced a number of financial medicine practices and associated unethical conduct. Examples included over-servicing (establishing intravenous access or administering medications where it is not clinically indicated in order to bill for a higher level of care), selective patient treatment (only treating patients with medical

insurance), fraudulent billing practices, eliciting of “kickbacks”, incentives or benefits and deliberate time wasting on scene (in order to increase the billed time).

The results of this study are concerning as the actions of service providers described by the participants constitute gross violations of the ethical and professional guidelines for the profession. The author recommends further additional studies should be conducted to explore these findings and to establish the reasons for, and ways of limiting financial medicine practices in the local emergency care environment.

THE STATE OF INFECTION CONTROL IN THE ETHEKWINI PUBLIC SECTOR EMERGENCY MEDICAL SERVICES

Student: Natalee Williams-Claassen
Supervisors: N. Sibiya and Sageshin Naguran

Department of Emergency Medical Care & Rescue Durban University of Technology

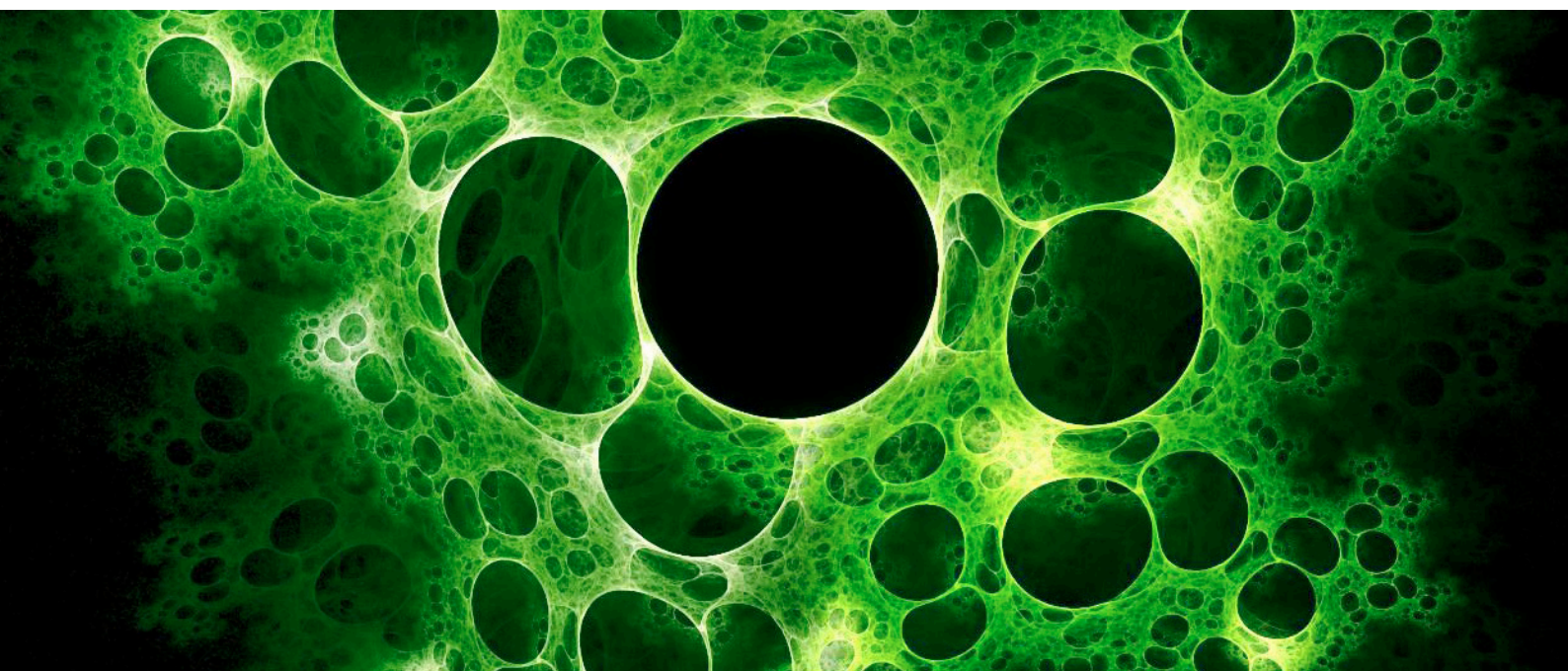
There is presently no national policy on communicable diseases and infection control that is specifically designed for use in the South African pre-hospital environment. This study was conducted to develop an ambulance specific disinfection protocol and to evaluate its effectiveness in the public sector Emergency Medical Services (EMS) in the eThekweni District of KwaZulu-Natal.

The study comprised of three consecutive phases. In the first phase focus group discussions were conducted to identify the factors needed to develop a disinfection protocol. The study population consisted of both operational and management staff from the EMS under study. Thereafter, the

information gathered was used in conjunction with internationally accepted guidelines to develop an ambulance specific disinfection protocol (Phase Two). The third phase entailed the implementation of the protocol at seven ambulance bases in the eThekweni health district and the evaluation of the protocol with the use of an open-ended questionnaire at two weeks and four weeks after implementation. A single ambulance crew and their immediate supervisor from each base were utilized in this phase.

During the development, implementation and evaluation of the protocol, many themes with regard to infection control in EMS were identified, such as the lack of infrastructure, training and cleaning

materials. The development and implementation of a protocol and policy document for infection control specifically for EMS is required. There is a need for the deployment of more ambulances and the employment of more operational EMS staff together with the appointment of Infection Control Supervisors at all ambulance bases. Without the adequate infrastructure needed to meet infection control and prevention requirements, there may be a serious risk to both staff and the patients they serve.



ADVANCED LIFE SUPPORT PARAMEDICS' KNOWLEDGE REGARDING WAVEFORM CAPNOGRAPHY

Student: Keanan Reynolds
Supervisor: Benjamin van Nugteren and Craig Lambert

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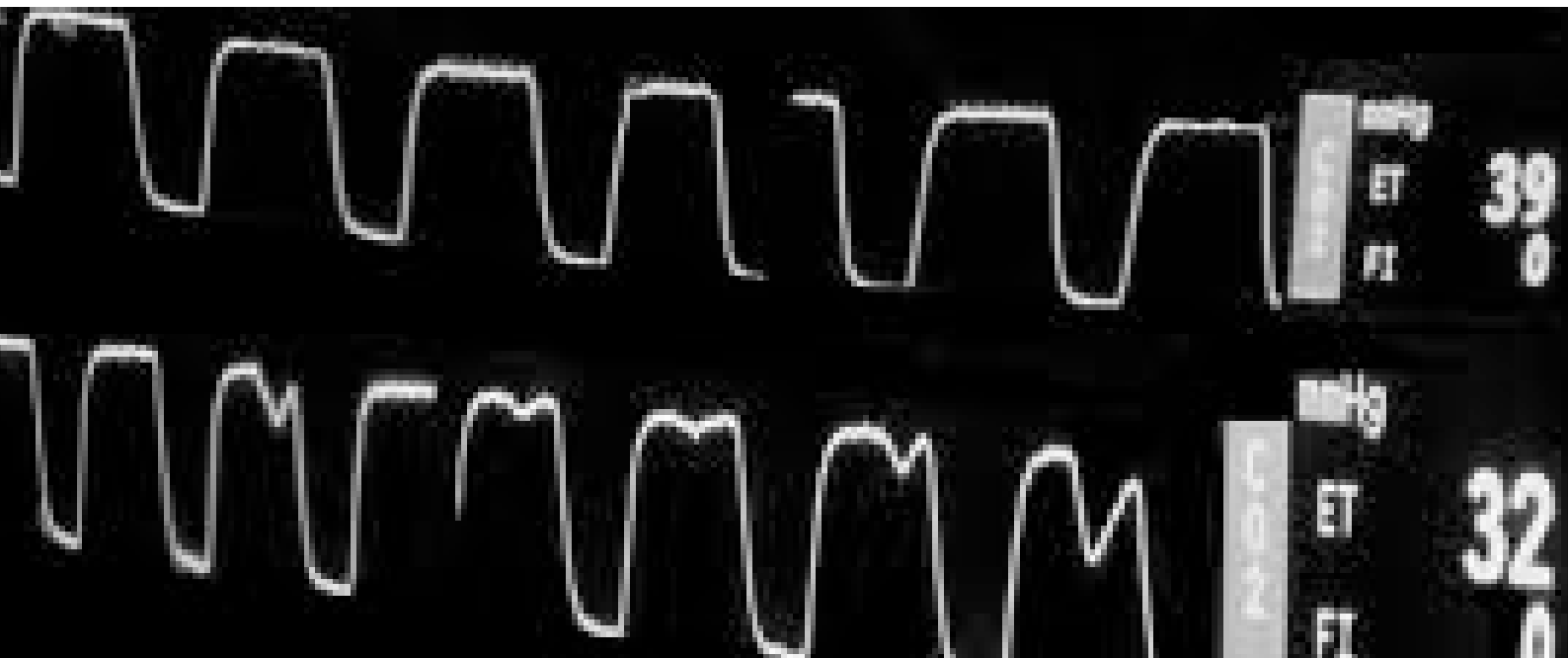
Capnography is a continuous, non-invasive means of measuring exhaled CO₂ concentrations during a respiratory cycle. The information provided by capnography can provide the user with information about underlying cellular processes, respiratory effort as well as the patency/pathology of the lower airway. Capnography has also been suggested as the gold standard for confirming endotracheal tube (ETT) placement during advanced airway management and can also indicate certain lung and ventilation disorders such as bronchospasm and patient/ventilator dyssynchrony. These waveforms have characteristic features based on the amount and quality of flow passing by the CO₂ sensor at a given time. All of these

characteristics make the capnograph a valuable piece of equipment both in the in-hospital and out-of-hospital setting when dealing with a patient who needs airway intervention.

The aim of the study was to determine whether Advanced Life Support (ALS) paramedics in South Africa were able to correctly assess and interpret various capnographic waveforms and values. The design was prospective, observational and quantitative in nature. The study made use of a self-designed, non-validated questionnaire which was emailed to potential participants. The questionnaire consisted of six waveforms in two sections: Section One provided the graphical representation of various waveforms that required assessment; while

Section Two provided the participant with the assessment of the waveform and required an intervention to be selected based on the waveform provided.

Section One of this study found participants were adequately able to assess and identify bronchospasm/bronchoconstriction, hyperventilation, hypoventilation and normal waveforms; while loss of ventilation and "curare cleft" waveforms were poorly identified. Section Two found the majority of participants selecting the correct intervention for all waveforms except the loss of ventilation waveform. These results demonstrate a good understanding of the use of capnographs by South African ALS paramedics who participated.





EN PASSANT

A selection of articles published in the last six months, of relevance to pre-hospital emergency care. These studies are briefly extracted “in passing”.

DOES USE OF THE ‘RECOGNITION OF STROKE IN THE EMERGENCY ROOM STROKE ASSESSMENT TOOL’ ENHANCE STROKE RECOGNITION BY AMBULANCE CLINICIANS?

United Kingdom researchers evaluated the performance and benefits of ambulance technicians in using the Recognition of Stroke in the Emergency Room (ROSIER) tool in comparison to the Face Arm Speech Test (FAST) (similar to the Cincinnati Prehospital Stroke Scale). ROSIER, a 7-item screening tool for CVA, had been shown to be superior in the hospital environment, but

had not been studied in the pre-hospital environment. The results showed that 64% of strokes and 78% of non-strokes identified by ROSIER were confirmed by a stroke consultant. Importantly, there was no difference in the proportion of strokes identified by both the ROSIER and FAST screens, with both showing excellent levels of sensitivity, but poor levels of specificity. The

researchers concluded that the continuation of using FAST was suitable for pre-hospital use, but recommended extending it to include seizure activity.

Fothergill RT, Williams J, Edwards MJ, Russell IT, Gompertz P. Stroke. 2013;44:3007-30012.

PERIPHERAL VASCULAR ACCESS IN CHILDREN

Peripheral venous access (PVA) is known to be challenging in children, with success rates lower than those found in adults. Add to that the relatively uncontrolled pre-hospital environment and the problem of rapid access when it is needed becomes obvious. This retrospective chart review aimed to describe PVA success rates in children, and to assess the effect of diminishing age on PIA success from data recorded in electronic patient care records over an eight year period for patients 18 years of age or younger. The

data originated from an Emergency Medical Service covering an area from Minnesota through to western Wisconsin in the USA. Of the 261,008 patient care records accessed, 2% were associated with paediatric PVA attempts with a total of 4,721 attempts recorded. Most patients (89%) had one PVA attempt. A significant relationship between age and PVA success was established; success was associated with a mean age of 14 years while failure was associated with a mean age of 11 years. Each one year increase in

patient age was associated with an 11% increase in the odds of PVA success. This study confirms the results of similar research on paediatric PVA and further strengthens the argument for strong consideration of other vascular access routes (e.g. intraosseous) in small children as a first-line approach.

Myers LA, Arteaga GM, Kolb L, Lohse CM, Russi CS. Prehospital Emergency Care. 2013;17:425-428.

ADVANCED AIRWAY INTERVENTIONS IN OUT-OF-HOSPITAL CARDIAC ARREST: MORE EVIDENCE NEEDED

Since the emphasis of quality chest compressions as the mainstay of survival from out-of-hospital cardiac arrest (OHCA) some years ago, the role of advanced airway management during resuscitation has been debated. This study, a meta-analysis (see *Sanguine* 2013;3(1) for an introduction to meta-analysis), of 17 observational studies aimed to add to the existing knowledge on airway management practices in OHCA. The authors chose outcomes of both short term survival (return of spontaneous circulation) and longer term survival and conducted sensitivity analysis by separating

patients for analysis; those of 16 years of age or older, non-trauma only and attempted vs. successful advanced airway interventions. The meta-analysis included 388,878 patients with results indicating that short term survival was adversely affected for endotracheal intubation (OR 0.79 95% CI 0.54; 1.16) and supraglottic airways (OR 0.59 95% CI 0.39 to 0.89) compared to basic airway interventions. Long-term survival showed a similar trend for endotracheal intubation (0.48 95% CI 0.36 to 0.64) and supraglottic airways (OR 0.35 95% CI 0.28 to 0.44). Sensitivity analysis did not

have any significant effect on these results. Although these results showed decreased survival with the use of advanced airway interventions in OHCA, one third of the studies included did not adjust for confounding factors making it likely that these results are biased. A large controlled trial is needed to provide a definitive answer to the question of advanced airway interventions and their role in the treatment of OHCA.

Fouche PF, Simpson PM, Bendall J, Thomas RE, Cone DC, Suhail AR. *Prehospital Emergency Care*. 2013;Oct 10. [Epub ahead of print]

PRE-HOSPITAL RAPID SEQUENCE INTUBATION IN SOUTH AFRICA: WHERE ARE THE REAL ADVERSE EVENTS?

This retrospective case review aimed to establish whether paramedic rapid sequence intubation (RSI) in South Africa is safe and effective. All RSI cases performed in a private Emergency Medical Service over a two year period (86 RSIs) were included for analysis. Outcome measures were self-reported success of endotracheal intubation (ETI) and the rate of adverse events, defined as hypotension, hypoxia or "other complication". The most common indication for RSI was 'Combative/agitated head injury', followed by decreased level of consciousness and predicted clinical course. Etomidate

and suxamethonium were the most frequently used medication combination for RSI. Results further showed that all ETI attempts were successful. Just fewer than one quarter of patients experienced an adverse event as defined by the authors, who conclude that the adverse event rate highlights "safety concerns". This study, although important in that it is the first of its kind in South Africa, contains serious flaws. In their background, the authors give a description of training related to RSI which is incorrect and not a reflection of how RSI and airway management

are currently taught on Emergency Medical Care degree programmes. More importantly, the underlying conditions of patients cannot be excluded as causes of any of the (very broadly defined) adverse events reported in this study, making their causative link to RSI tenuous at best. The author's conclusions regarding the safety of RSI in this study are not supported by the available data, or their analysis of it.

Gunning M, Perkins Z, Crilly J, von Rahden R. *South African Medical Journal*. 2013;113(9):632-637.

