

## 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)

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

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

<b>Safety</b>	Take universal/standard precautions prn* (gloves, eye protection, helmet, safety gear)
<b>F - Fear</b>	Does anything make you fear that the scene may be unsafe? (obvious or subtle dangers)
<b>I - Incident</b>	Determine the nature of the incident while entering
<b>R - numberR</b>	Determine the number of patients involved while entering
<b>S - Send for help</b>	Send for appropriate help (as required)
<b>T - Trauma or Triage</b>	Consider <b>T</b> rauma to the patient's c-spine prn <OR> Perform <b>T</b> riage in MCI
<b>G - General Impression</b>	Develop an impression of the situation (report to dispatch, prn)
	Patient's approximate age, gender, location/position found, and apparent level of distress/acuity
<b>E - Estimate level of awareness</b>	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)
<b>T - Threats</b>	<b>Assess:</b> for any immediate threats to self, team, patient and bystanders before beginning the ABCDE's
	<b>Consider:</b> 'POPE' (People, Objects, Places, Environment) and control of catastrophic/life-threatening haemorrhage prn
<b>ABCDEs</b>	<b>Use a 'find-it, fix-it, move-forward' approach</b>
<b>A - Airway</b>	<b>Assess:</b>
	Is the airway patent?
	Does it need clearing?
	Are there current, or impending, obstructive difficulties?
	<b>Consider:</b>
	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>B - Breathing</b>	<b>Assess:</b>
	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)
	<b>Consider:</b>
	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)	
<b>C - Circulation</b>	<b>Assess:</b>
	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)
	<b>Consider:</b>
	Direct pressure/tourniquet for uncontrolled haemorrhage
	Cardiopulmonary resuscitation if vital signs absent
	Intravenous initiation
Electrocardiogram determination prn	

continued overleaf...

<b>D - Disability</b>	<b>Assess:</b>
	<i>Medical: "BANG ZAP PUSH"</i>
	<b>Benzodiazepine</b> treatment for prolonged seizures
	<b>Adrenaline</b> (epinephrine) for life threatening bronchospasm (e.g. anaphylaxis, asthma)
	<b>Naloxone</b> for narcotic overdose with inadequate ventilation
	<b>Glucose</b> for hypoglycaemia
	<b>ZAP:</b> Defibrillation or Cardioversion prn
	<b>Push</b> (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
	<b>Consider:</b>
	Any other treatment required immediately based on presentation so far
<b>E - Extrication</b>	<b>Assess:</b>
	Current environmental conditions (e.g. heat, cold, wind, rain, direct sun, impending danger)
	Egress route to transportation (manual handling considerations, obstacles, dangers)
	<b>Consider:</b>
	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.)	
<b>Note:</b> 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)
<b>C (See):</b> 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 <sub>2</sub> )
	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 <sub>2</sub> )	

continued overleaf...

<b>Assessed:</b> 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
<b>(and) Treated:</b> 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.

### References

1. St John Ambulance. St John Ambulance NT Clinical Practice Manual version 2.3 2013 [cited 2017 18 November]. Available from: <https://www.stjohnnt.org.au/img/documents/clinical-manuals/CPG-HV23June2013.pdf>.
2. Australian New Zealand Council of Resuscitation. Basic Life Support 2016 [cited 2017 17 November]. Available from: <https://resus.org.au/guidelines/flowcharts-3/#>.
3. ACT Ambulance Service. Clinical Management Guidelines 2017 [Available from: <http://esa.act.gov.au/actas/about-us/clinical-management-guidelines/>].
4. NSW Ambulance. Ambulance Protocols and Pharmacology 2016 [Available from: <http://ciap.hcn.com.au/www.ciap.health.nsw.gov.au/specialties/cda.html>].
5. Ambulance Victoria. Clinical practice guidelines for MICA and ambulance paramedics Melbourne, Victoria: Ambulance Victoria; 2017 [Available from: <http://s3-ap-southeast-2.amazonaws.com/prod.assets.ambulance.vic.gov.au/wp-content/uploads/2016/07/CPG-2016-Edition-Vs.1.1web-reducedsize-flattened-secure.pdf>].
6. Queensland Ambulance Service. QAS Clinical Practice Manual Kedron Park, Brisbane: Queensland Government; 2017 [cited 2017 18 November]. Available from: <https://www.ambulance.qld.gov.au/CPGtable.html>.
7. St John. Clinical Procedures and Guidelines: Comprehensive edition 2016 - 2018 2016 [cited 2017 18 November]. Available from: <http://www.rgpn.org.nz/Network/media/documents/St%20John%20CPGs%202016-18/St-John-CPGs,-comprehensive-edition,-2016-2018.pdf>.
8. Wellington Free Ambulance. Clinical Procedures and Guidelines: Comprehensive edition 2016 - 2018 2016 [Available from: [http://www.wfa.org.nz/file/931/WFACPG\\_Comprehensive\\_LQ170228.pdf](http://www.wfa.org.nz/file/931/WFACPG_Comprehensive_LQ170228.pdf)].
9. Joint Royal Colleges Ambulance Liaison Committee. UK ambulance services clinical practice guidelines 2016: Class Publishing; 2016.
10. Pre-Hospital Emergency Care Council. Clinical Practice guidelines 2017 [Available from: [http://www.phecit.ie/PHECC/Clinical\\_resources/Clinical\\_practice\\_guidelines/2017\\_edition\\_CPGs/PHECC/Clinical\\_Resources/Clinical\\_Practice\\_Guidelines\\_\\_CPGs\\_/2017\\_edition\\_CPGs.aspx?Hkey=6fe87354-a1f5-4818-a098-7767551a68cf](http://www.phecit.ie/PHECC/Clinical_resources/Clinical_practice_guidelines/2017_edition_CPGs/PHECC/Clinical_Resources/Clinical_Practice_Guidelines__CPGs_/2017_edition_CPGs.aspx?Hkey=6fe87354-a1f5-4818-a098-7767551a68cf)].
11. National Association of State EMS Officials. National Model EMS Clinical Guidelines Version 2.0 2017 [Available from: <https://nasemso.org/documents/National-Model-EMS-Clinical-Guidelines-2017-Distribution-Version-05Oct2017.pdf>].
12. Health Professions Council of South Africa. HPCSA Capabilities of Emergency Care Providers 2016: HPCSA; 2016 [Available from: [http://www.hpcsa.co.za/Uploads/editor/UserFiles/downloads/emergency\\_care/CAPABILITIES\\_June\\_2016.pdf](http://www.hpcsa.co.za/Uploads/editor/UserFiles/downloads/emergency_care/CAPABILITIES_June_2016.pdf)].
13. National Ambulance. Clinical Practice Guidelines and Treatment Protocols. Abu Dhabi: National Ambulance; 2015.
14. National Registry of Emergency Medical Technicians. Medical, Trauma and Cardiac Arrest Skill Sheets 2011 [Available from: <https://www.nremt.org/rwd/public/document/psychomotor-exam>].
15. Pre-Hospital Emergency Care Council. Objective Structured Clinical Examination (OSCE) Primary Assessment Sheets 2017 [Available from: <http://www.phecit.ie/Images/PHECC/Members%20and%20Students/20170405%20LD%20Assessment%20Sheets%20Paramedic%20Primary%202017%20OSCEs.pdf>].
16. Pre-Hospital Emergency Care Council. Objective Structured Clinical Examination (OSCE) Secondary Assessment Sheets 2017 [Available from: <http://www.phecit.ie/Images/PHECC/Members%20and%20Students/20170505%20LD%20Assessment%20Sheets%20Paramedic%20Secondary%202017%20OSCEs.pdf>].