Scaffolded Clinical Skills Development for Clinical Managers in the Royal Australian Navy

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Abstract

The Clinical Manager (CM) has been described as a linchpin to the healthcare capabilities of the Royal Australian Navy (RAN). Education and development for this important role has undergone substantial change in recent years, moving from an internally operated course to an externally provided higher education qualification. These changes in education include the manner in which clinical skills training is delivered. It is now embedded into a scaffolded approach that takes the learner from introduction of underlying knowledge to skills trainers, simulation, cadaveric training and whole of sick bay simulation. This article seeks to outline the changes that have occurred in CM education, and describes the scaffolded approach used to develop their clinical skills.

Keywords: clinical manager, clinical skills, scaffolding

Background

The manner in which advanced clinical skills in paramedic or out of hospital care are initially trained and subsequently maintained can have a significant impact on skill performance and practitioner self-efficacy. Within the RAN the CM is a senior sailor who holds a clinical scope of practice that incorporates advanced clinical skills that the authors suggest is comparable to a combination of a civilian Intensive Care Paramedic and Extended Care Paramedic, combined into one role. The training of clinical skills for CMs has undergone a number of changes in recent years with the introduction of the Bachelor of Paramedic Practice (BPP) Australian Defence Force Conversion.[1] This course, offered by the University of Tasmania (UTAS) in partnership with the Royal Australian Navy Medical School (RANMS), has become a key element in the CM qualification. This article will outline the educational method and implementation of a scaffolded approach to clinical skills development incorporated into the current CM course.

The CM course is the RAN's premiere medical course for Navy Medics, and prepares them to take the senior clinical role in the Navy's Major Fleet Units (MFU). The CM qualification is a prerequisite for promotion from Leading Seaman to Petty Officer, and is the first step in the move from a tactical patient-centred view to a strategic-capability view of patient management. The CM course is a voluntary course and is open to any Medical Sailor that has completed at least 12 months at sea, two years as a leading seaman and has been recommended by command for the CM role. Most sailors reach this qualification period at the 8 to 12-year mark of their career.

Prior to the introduction of the current collaboration between UTAS and the RANMS, the CM course was delivered over 12 months as a face-to-face vocational program, supported by ADF Reserve specialists for clinical skills delivery. Following a review into the CM course in 2013, it was decided to outsource a component of the course to assist in maintaining the highest standard of delivery and to maintain practice at or above the industry standard. An initial trial was completed in 2015 utilising an external provider delivering core components on the CM course. This pilot program, incorporating the Advanced Diploma in Paramedical Science (Ambulance), proved the CM course could be delivered as a mixed methods course. Despite this positive experience the Advanced Diploma of Paramedical Science (Ambulance) was deleted from the Australian Health Training Package in 2015,[2] necessitating a change in provider.

Following the aforementioned changes to the health training package, the RANMS approached UTAS to explore how the BPP conversion degree might be used to address the qualification requirements of the CM program. The BPP conversion is a degree entry program offered by UTAS since 2011, and is designed to provide a qualification pathway for paramedics and military advanced medics to transition their prior vocational qualifications through to the new industry standard bachelor degree. The BPP conversion

course has been attracting increased interest from military medics for a number of years, raising its profile across the defence forces.[3] Following a period of consultation between the parties the BPP (ADF Conversion) was developed.

This new degree entry program incorporated all of the capabilities associated with the BPP, which align with much of the capability set of the CM, along with the modification of some units to incorporate the advanced clinical knowledge and capability set required of a CM not normally offered at paramedic level (see Table 1). In addition to the UTAS BPP program, the RAN Medical School continues to deliver components of the CM course focused on Maritime Sickbay Management, Mental Health in the deployed Remote and Maritime Environments, Aviation Medicine, Underwater Medicine and Primary Health Care. The new course was successfully trialled in 2016 following which, the course was adopted for a longer-term contract from 2017.

Table 1. Advanced clinical skills in the CM Course

Endotracheal Intubation
Surgical Airway
Finger Thoracostomy
Tube Thoracostomy

As reflected in Table 1, clinical skills incorporated in the CM course include endotracheal intubation, surgical airway using the scalpel/finger/bougie technique, and finger and tube thoracostomy. These clinical skills are delivered by a team of educators incorporating Intensive Care Paramedics, CM instructors from the RANMS and Emergency Physicians with a defence force clinical background. This range of educators enables the delivery of knowledge and skills that incorporate a wide range of professional contexts, providing a well-rounded graduate perspective.

Clinical skill development in the BPP/CM course

A key feature of the clinical skills development in the new CM course is the scaffolding of clinical skills to enhance learner transition from novice through to proficiency at an entry level for the newly acquired capabilities. Scaffolding in the context of clinical learning can be described as a process of introducing the new knowledge and associated skills, offering an opportunity for initial skill development in an initially low-fidelity context with support from instructors. With progressive advancement of the learner's performance, the learning environment or experience increases in fidelity, along with a gradual reduction in learner support as the learner gains independence.[4,5] This type of educational design aligns with the gradual release of responsibility (GRR) model in which the instructor releases responsibility for the student's learning as the student's knowledge and proficiency increases and they move towards independence.[6] Figure 1 represents a modified GRR model reflected in the clinical skills teaching model used in the CM course.

Figure 1

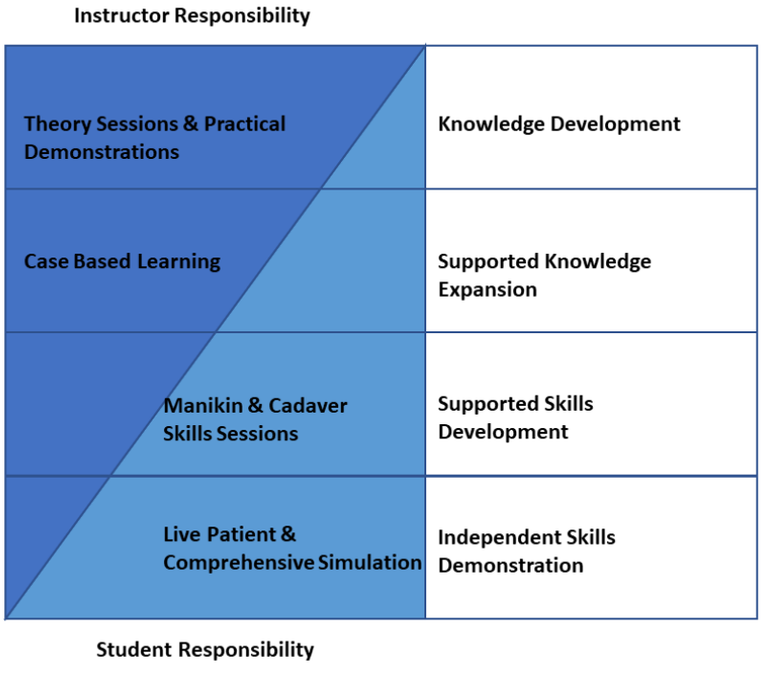

Table 2. Bondy Rating Scale (11)

Scale Label	Professional standard	Quality of clinical performance	Assistance
1 Independent	Safe Outcome achieved Appropriate Behaviour	Confident, proficient Appropriate time Accurate knowledge	Without supportive cues
2 Supervised	Safe Outcome achieved Behaviour mostly appropriate	Confident, efficient Reasonable time Occasional knowledge prompting	Occasional supportive cues
3 Assisted	Safe Outcome mostly achieved Behaviour generally appropriate	Skilful in some aspects, inefficient in others Delayed time Requires some explanation	Regular directive cues in addition to supportive cues
4 Marginal	Safe only with guidance Outcome incomplete achieved Behaviour generally appropriate	Unskilled, inefficient Prolonged time Continual knowledge prompting	Frequent directive cues
5 Dependent	Unsafe Outcome not achieved Behaviour inappropriate	Lacks confidence, efficiency Unable to complete Very limited knowledge	Continual verbal and physical directive cues

In the CM course, students receive theory content in small group lectures and workshops, complimented by case-based learning sessions to encourage a whole of patient view point. Students then gain initial exposure to the practice of clinical skills using skills trainers and simulation manikins such as the Laerdal® Airway Management Trainer[7] and the SimMan® ALS.[8] This allows the learner to develop an understanding of the application of clinical skills in a safe environment where they have space to make errors and the time to receive corrections on their skill performance.

Following the opportunity to develop their skill performance in a low-fidelity setting using skills trainers and manikins, CM students are then introduced to performing the clinical skills on cadavers at the UTAS School of Medicine in Hobart, Tasmania. The use of fresh frozen cadavers provides a degree of functional high fidelity not present in the majority of manikins,[9,10] which may provide a semblance of structural accuracy of anatomy, but do not respond in a tactile manner consistent with reality. Examples of the improved tactile fidelity experienced by learners using fresh frozen cadavers includes realistic sensations, such as the mobility of a larynx when attempting surgical airway insertion, or the ability to experience the feel of a finger sweep during the performance of a finger thoracostomy or tube thoracostomy. The benefit of higher tactile fidelity in these infrequently performed yet high risk skills should not be underappreciated.

Throughout the conduct of clinical skills training, CM students are required to maintain a clinical skills portfolio. Students are expected to get the instructor they are working with to complete an achievement record for each performance, indicating the level of the performance. The context of their practice is also recorded (i.e. manikin or cadaver-based performance). This allows the learner to review their progress and make use of instructor comments to reflect on their progression in skill development. The clinical skills portfolio is graded using the Bondy Rating Scale[11] reflected in Table 2. Students are required to achieve five independent performances of the skill at each level prior to progressing to the next, for example a learner must achieve five consecutive independent endotracheal intubations on a manikin prior to moving on to cadaver performances, and similarly, must achieve five consecutive independent performances on a cadaver prior to moving on to live patient performances under the supervision of an anaesthetist.

To provide the greatest opportunity for the CM students to consolidate what they have learned over the course, nine weeks of clinical placement are conducted across the various disciplines the CM is expected to be proficient in. The placements include three weeks with a NSW Ambulance intensive care crew, focusing on their emergency response, initial assessment and management of immediate life threats and the diverse intensive care case load. The second placement period is three weeks in an operating theatre working with the anaesthetist to

hone their airway management skills. This focuses on supraglottic airway and endotracheal tube insertion and management; the difficult airway and failed airway (can't intubate, can't ventilate) process. The theatre placement is essential to the fourth stage of the scaffolded approach to the clinical skill development; moving each student from theory to manikin and cadaver before exposure to live patients to demonstrate competence. Final placement is conducted in a remote practice environment currently with the Torres and Cape Hospital and Health services in Far North Queensland. These three weeks of placement aim to provide the students an opportunity to work in the remote austere environment, in a health service that utilises the Primary Clinical Care Manual as its clinical guideline. These locations are chosen as it is the closest analogue to mimic the role 1 medical facility of a RAN ship at sea.

Rounding out the CM course a 48–72-hour final simulation is completed by each student to demonstrate a consolidation of all components of the 11-month course. This simulation has the student take over a ships sickbay, complete a departmental audit of all equipment and medical stores, and manage a number of clinical presentations ranging from primary health care presentation to emergency response situations for both paediatric and adult patients. Students utilise the full range of their newly acquired capabilities including the advanced clinical skills described above in the management of these simulations. The students are required to liaise with all stakeholders in real time to affect the evacuation of patients from the maritime environment where appropriate. The ability of the student to demonstrate command and control of a small medical team, provide clinical guidance and risk assessment support to command and meet environmental health issues for the simulated crew is also an important part of this final assessment.

The scaffolded approach used in the CM course provides clinical skills training that takes the learner from skill trainer to manikin-based simulation, cadaver-based simulation, live patient skill performance and finally, whole-of-case simulation. While there is a dearth of literature supporting this approach in a cohort of Navy learners, the use of simulation has been shown to raise performance outcomes of learners as well as improving learner satisfaction with the learning experience.[12,13] Simulation using cadavers has further been shown to increase the self-confidence of learners in their skills performance.[13] The goal of the scaffolded model of clinical skills training described here is to produce a practitioner that is well prepared to practice in an environment in which supervision and support opportunities are limited or remote, such as the environment aboard a MFU.[14]

Future directions

Having established a scaffolded model for the delivery of clinical skills training for CM's, there is a clear need for evaluation to establish an understanding of the impact of the educational model. Therefore, future directions include: an evaluation of the learning experience to explore the value in the eyes of the learner; skill and knowledge retention studies and studies into practitioner self-efficacy following completion of this model of education; a review of clinical skill use in both actual and simulated case presentations following qualification. This last point, review of skill use, can serve as a foundation to underpin any agenda and strategies for the creation of a recertification program to reinforce infrequent skill performance to maintain CM capabilities. Furthermore, this article explores the clinical skills training provided to CMs and does not explore the wider health services provided or leadership and management functions of a CM. While these elements are addressed in the course undertaken, they are an area for further exploration and discussion beyond the scope of this article.

Conclusion

The RAN medic (and particularly the CM) has been described as a linchpin of Navy's healthcare capability.[14] The manner in which CMs are educated and trained for their clinical skills is likely to have significant impact on knowledge and skill retention as well as their self-efficacy in practice. This article has described the current model used in the education and assessment of advanced clinical skills in the CM course and the BPP (ADF Conversion). Through the scaffolded approach described, graduates of the CM course have a solid foundation upon which they can build their future clinical practice and professional development.

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References

1. The University of Tasmania. Bachelor of Paramedic Practice (ADF Conversion) (53D) Hobart: The University of Tasmania. 2018; cited [2018 23/11/2018]. Available from: http://www.utas.edu.au/courses/chm/courses/53d-bachelor-of-paramedic-practice-adf-conversion.
2. Department of Education and Training. HLT60307 - Advanced Diploma of Paramedical Science (Ambulance) (Release 2) Canberra: Department of Education and Training. 2015. Available from: https://training.gov.au/Training/Details/HLT60307?tableUnits-page=2&setFocus=tableUnits.
3. Edwards D, Williams A-M, Harris W, Lighton D, Selmes I. Experiences in the delivery of a flexible education program to military students. Australasian Military Medicine Association Conference; Sydney; 2014.
4. Bradley P, Postlethwaite K. Simulation in clinical learning. Medical Education. 2003;37(s1):1–5. DOI: https://doi.org/10.1046/j.1365-2923.37.s1.1.x.
5. Perkins GD. Simulation in resuscitation training. Resuscitation. 2007;73(2):202–11. DOI: https://doi.org/10.1016/j.resuscitation.2007.01.005.
6. Fisher D, Frey N. Better learning through structured teaching: A framework for the gradual release of responsibility: ASCD; 2013.
7. Laerdal. Laerdal®Airway Management Trainer: Laerdal. 2018; cited [2018 23/11/2018]. Available from: https://www.laerdal.com/au/doc/3155/SimMan-ALS.
8. Laerdal. SimMan® ALS: Laerdal. 2018; cited [2018 23/11/2018]. Available from: https://www.laerdal.com/au/doc/3155/SimMan-ALS.
9. Kovacs G, Levitan R, Sandeski R. Clinical Cadavers as a Simulation Resource for Procedural Learning. AEM Education and Training. 2018;2(3):239–47. DOI: https://doi.org/doi:10.1002/aet2.10103.
10. Yang JH, Kim Y-M, Chung HS, Cho J, Lee H-M, Kang G-H, et al. Comparison of four manikins and fresh frozen cadaver models for direct laryngoscopic orotracheal intubation training. Emergency Medicine Journal. 2010;27(1):13–6. DOI: https://doi.org/10.1136/emj.2008.066456.
11. Bondy KN. Criterion-referenced definitions for rating scales in clinical evaluation. Journal of Nursing Education. 1983;22(9):376–82. DOI: https://doi.org/10.3928/0148-4834-19831101-04.
12. Kennedy CC, Cannon EK, Warner DO, Cook DA. Advanced Airway Management Simulation Training in Medical Education: A Systematic Review and Meta-Analysis. Critical Care Medicine. 2014;42(1):169–78. DOI: https://doi.org/10.1097/CCM.0b013e31829a721f.
13. Sun Y, Pan C, Li T, Gan TJ. Airway management education: simulation based training versus non-simulation based training-A systematic review and meta-analyses. BMC Anesthesiology. 2017;17(1):17. DOI: https://doi.org/10.1186/s12871-017-0313-7.
14. Westphalen N. Letter to the Editor. Journal of Military and Veterans' Health. 2015;23(2):5-6. Available from: https://jmvh.org/article/letter-to-the-editor-3/.