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## Community ambulance response trolleys: Preparing students for the paramedic workplace

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## Research

# Community ambulance response trolleys: Preparing students for the paramedic workplace

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## Abstract

### Introduction

The curriculum of undergraduate paramedicine programs invariably includes clinical placement. Engagement in learning in the workplace is, however, constrained by lack of familiarity with workplace cultural expectations. Strategies assisting students to understand workplace expectations have the potential to enhance engagement on placements and with workplace transition. This study examines whether one classroom practice initiative heightens students' understanding of specific paramedic workplace expectations.

### Methods

Community ambulance response trolleys (CART) (a system developed to mimic equipment management strategies of the paramedic workplace) was introduced on one campus of an Australian university. Another university campus was selected as a comparison site and did not operate CART. The CART campus students were assigned to a team and made responsible for maintaining and restocking all equipment utilised in practical classes, simulating strategies used within the paramedic workplace where a paramedic team shares responsibility for stocking and upkeep of equipment. Both cohorts completed a questionnaire exploring their experiences in the classroom and preparation for clinical placements.

### Results

The CART system had a positive influence on the ability of students to collaborate within the classroom and become familiar with industry expectations around equipment management. This increased confidence with transition to learning within the workplace environment.

### Conclusion

The CART strategy was effective in mimicking workplace practices and expectation, and evidence indicated that the CART system could assist students with their ability to transition into a vocational environment.

### Keywords:

education, allied health personnel, workplace, simulation training, culture

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## Introduction

By exposing paramedicine students to the culture and expectations of the working environment, clinical placements provide an essential opportunity for students to develop the professional skills and knowledge necessary for entry to the workforce (1,2). However, even where placements provide consistently replicable experiences, sending students on placement does not guarantee learning or competence (3). In addition to practical hurdles, such as the acquisition of placements (4), the ability of ambulance services to meet the challenge of providing quality learning and supervision opportunities for students is variable (5). Students report unproductive downtime, not being given the opportunity to participate in patient care, and a sometimes-unsupportive learning environment (6). To exacerbate this, the nature of the paramedic workplace means that placements vary significantly in their nature (6) and are therefore of inconsistent quality and value for students, resulting in highly variable learning experiences (7). University educators are therefore faced with the challenge of equipping students to maximise their learning in unreliable and dynamic environments.

Understanding workplace expectations in relation to equipment management and integrating these expectations into practice is one such challenge. It is essential that paramedics have all the required equipment available, functional and fully stocked as the majority of clinical functions are dependent on sound practice in this area. Further, because paramedics operate as part of several teams, the ability of the team to operate effectively is dependent on having an operational set of equipment. These teams include the immediate partnership in which the majority of paramedics operate, but also extend to wider teams that share equipment on a vehicle at a branch or station level in addition to other teams that paramedics may interact with at incidents in the field.

In order to regularly and consistently embed good practice around the management of equipment into the classroom at a beginning level, the CART system was introduced into paramedicine practical classes on one campus of a multi-campus university. The CARTs comprise a series of trolleys that house all essential paramedic equipment – mirroring equipment used on an emergency ambulance. This includes cardiac monitor-defibrillators, oxygen administration equipment, diagnostic equipment and simulated versions of commonly administered drugs and consumables. In keeping with the naming conventions used in industry, CARTs are labelled with location names. All students in all year levels were allocated to a CART for the duration of each semester. Handover principles used in the field to ensure that equipment is maintained to a prescribed standard were also applied to classroom practices. This meant that students were accountable for the maintenance of their equipment within their immediate team in practical classes. It also meant that this responsibility extended to students in different practical classes

in the same year level, and to other year levels where students shared the same CART. Failure to maintain equipment on the CART to the required standard had the potential to impact on all students allocated to the CART. In this way, the system mirrored the interdependency of paramedicine teams in industry.

An additional motivation for introducing CARTs was practical. The introduction of the CART system responded to repeated incidents of student failure to maintain and restock equipment. Such practices led to disruption of classes due to equipment shortages and malfunction, and laboratory staff therefore operated in a labour intensive and reactionary mode to respond to student needs. This practical aspect provided an additional underpinning justification for a more robust strategy of equipment management by making students accountable while also providing an opportunity to immerse themselves in cultural practices related to equipment management that aligns to the practice of the paramedic workplace. The concept of communities of practice (8,9) underpins the CART initiative and the framework provides a model for understanding how facilitating the establishment and ongoing management of complex social relationships can assist newcomers to gain access to learning opportunities through participation in practice.

By analysing the value of the CART system within the paramedicine practical laboratory and its role in improving the understanding of workplace culture, this study builds on and contributes to work on transition of paramedicine students into the clinical placement experience, and ultimately the workplace. Although studies in transition to practice have examined the value of clinical placements (6,10), there is no extended study of how classroom management practices can assist students to make this transition. The CART system structures classroom communities in a manner that mirrors practice within the paramedic workplace, and provides a more seamless transition to the clinical placement environment through a better understanding of what is expected. In doing so, it also has the potential to create a focal point facilitating the development of student-to-student relationships and underpinning peer-learning networks within the learning environment.

## Methods - the CART intervention

In 2014, the CART system was piloted in paramedicine laboratories on one campus of a multi-campus Australian university, the 'CART campus'. All students were allocated to a CART team in their practical laboratory classes. Students remained in their designated CART teams for the entire semester and were expected to maintain and restock their equipment. They were provided with documents similar to those used in the field to manage the restocking of consumables and the maintenance of equipment.

Another campus not using the CART system within the same university where students were undertaking the same unit of study was used as a comparison site, the 'non-CART campus'. This campus relied more heavily on laboratory staff for the management of paramedic equipment in the classroom.

Ethics approval was gained to allow for the collection of data on both campuses. Year one students with minimal exposure to the clinical placement environment completed a survey consisting of a 15-item Likert-scale questionnaire based around three main themes (preparation for clinical placement, peer learning and logistical impact in classes). The survey included a free text section where students could provide qualitative feedback.

The survey was administered at the completion of one semester of using the CART system. There was a 55% return rate for the CART campus, consisting of 92 completed questionnaires and a 32% return rate for the non-CART campus where 43 questionnaires were completed.

## Results

SPSS software was utilised to analyse quantitative data derived from the Likert scale responses. To identify statistically significant results each item underwent t-tests ( $p < 0.05$  deemed acceptable) and Levene's test ( $p > 0.05$  deemed acceptable). Statistical analysis of the survey questions was undertaken around the three themes presented in Tables 1,

2 and 3) and showed significant evidence of the advantages of the CART system in some areas. Qualitative feedback was analysed thematically (11).

In general, analysis indicated that the CART system made a positive contribution to preparing students for clinical placement with students on the 'non-CART' campus feeling less comfortable in the clinical placement environment.

While all findings warrant further exploration, this discussion focuses on how the CART system contributed to student preparation for clinical placement. As shown in Table 1, students from the CART campus felt that the system of equipment management in the practical classroom positively influenced their entrance into the clinical placement environment. In general, students from the CART campus felt more comfortable with the prospect of going on clinical placement than the non-CART campus group. Qualitative comments from those students who had undertaken some clinical placements indicated that they felt more comfortable with the expectations of them regarding equipment management in the field and therefore more confident in their ability to interact with supervising paramedics in this aspect of their placement. One student stated: 'I got a lot of good feedback from [paramedics]... due to my confidence with equipment' with another student believing the reason for this improved engagement was 'because I was able to assist, they were willing and inviting for me to assist'.

Table 1. Placement preparation

	Mean (non-CART)	Mean (CART)	Levene's test (Sig.)	t-test Sig. (two-tailed)
I feel more comfortable about going on clinical placements as a result of the way ambulance equipment was managed in practical classes.	4.16	4.49	0.437	0.007
I gained insight into the importance of maintaining equipment to an operational standard in-field as a result of my practical classes.	4.26	4.58	0.001	0.008
I feel that the strategies used in the practical laboratories at ACU mirror the team approach used by paramedics on-road to manage ambulance equipment. This makes me feel that I understand the importance of teamwork in ambulance practice.	4.10	4.37	0.726	0.026
I feel comfortable interacting with paramedic teams in the field to restock and check ambulance equipment.	3.63	4.09	0.042	0.004
Being comfortable with the role of the paramedic in terms of managing the ambulance equipment meant I was able to interact with paramedics on placement and gain their support to assist me to learn.	3.89	4.37	0.082	0.001

Table 2. Peer learning

	Mean (non-CART)	Mean (CART)	Levene's test Sig.	t-test Sig. (two-tailed)
I frequently work as part of a team with other students in my practical class to maintain ambulance equipment.	4.37	4.51	0.499	0.227
I have developed relationships in practical classes as a result of the requirement to participate in the management of the ambulance equipment.	4.10	4.36	0.447	0.039
The way that the classroom equipment is setup encourages me to work with other students to ensure equipment is well maintained.	4.09	4.42	0.277	0.006
The relationships I have developed with other students in practical classes have assisted my learning as a paramedic student.	4.33	4.64	0.001	0.002
Through the relationships I have developed with other students in practical classes my confidence as a student paramedic has improved.	4.21	4.42	0.095	0.069
I frequently work as part of a team with students in other practical classes and year levels to maintain equipment.	3.50	3.83	0.493	0.089

Although the focus of the current discussion is on the value of the CART system in assisting students to transition into the clinical placement environment, other trends were evident. The operation of the CART system encouraged the development of a community of practice within the classroom. This assisted students to develop relationships within the student group, with one student indicating 'to manage equipment I found that all students in the class work together'. Another student stated 'new friends from prac[tical] classes have become really close'. These relationships were fostered through the shared responsibility for paramedic equipment. Extending from these relationships, students indicated that they used these relationships with peers to assist them with their learning.

One student stated that the CART system 'definitely... makes you make friends to study'. They also indicated that this process of peer assisted learning helped them to improve their confidence. The propensity of these relationships to encourage a peer-learning environment can serve to improve student confidence and therefore has the potential to provide a critical stepping-stone to student transition to clinical placements.

Results related to the logistical impact in classes were interesting. The non-CART campus indicated that there were fewer interruptions to classes and fewer problems with equipment. While this superficially appears unfavourable to the implementation of CART, these results were produced by a heavier reliance on laboratory staff and must also be offset against the benefits of improved peer relationships and aspects that favoured transition into the placement environment on the CART campus.

## Discussion

Community ambulance response trolleys facilitated a community of practice using paramedic equipment as a focal point to foster relationships that encouraged peer learning. In turn, a number of students grew in confidence in their ability to demonstrate competence to experienced practitioners. This growth in confidence can in part be attributed to building their understanding of workplace practices within the field of paramedicine. In building students' competence in maintaining a safe and functional working environment, access into the community of paramedic practice was facilitated (12).

Table 3. Logistical impact

	Mean (non-CART)	Mean (CART)	Levene's test Sig.	t-test Sig. (two-tailed)
Learning activities in practical classes are never interrupted due to missing equipment or equipment left in an unusable state.	4.51	3.71	0.057	0.000
The state that I have found the ambulance equipment left in is always safe.	4.48	4.27	0.596	0.114
I work with other students to maintain equipment and we never require the assistance of a staff member to locate equipment and/or restock ambulance equipment	3.33	3.21	0.041	0.513
Practical class activities are never interrupted due to equipment that has not been restocked or replaced.	4.10	3.27	0.000	0.000

In general, findings from this study indicate the CART system is of benefit in making clinical placements a more positive experience by familiarising students with the cultural expectations of the paramedic workplace. In addition, interdependency was fostered between students using equipment management as a platform. The shared responsibility for the CARTs within the classroom compelled students to engage with others and fostered the relationships essential to underpin peer learning. Evidence shows that peer assisted teaching and learning can be a positive feature of paramedic education (13) and students viewed the CART as having made a positive contribution to their ability to relate to peers and a conduit to a collaborative learning. As such, CART can be viewed as improving 'relational competence' in a similar way to other exercises premised on improving peer interaction (14). Further, the CART system facilitated collaborative approaches to learning, which familiarised students with the 'language' of expectations around the management of paramedic equipment and the roles paramedics play in maintaining 'tools of trade'.

The CART system provided simulation of a process governed by workplace language and culture. This is a valid educational resource in the same sense as clinical simulations previously demonstrated as effective in paramedic education (15). Fluency in the language of the workplace can assist students to build rapport with clinical staff and this influences student learning in a positive way (7). This serves to improve student knowledge of expectations of them on clinical placements and grows confidence. As lack of confidence has been identified as a variable inhibiting participation (4) improved confidence increases the likelihood of students operating effectively while on placement. Ultimately, it is anticipated that this enables a smoother transition into the workplace as a beginning

paramedic presenting one less challenge to overcome in a challenging work environment.

Current perspectives in workplace learning argue that the skills required for undergraduate students to learn through participation in the practice of a profession are those of managing complex social interactions that are characteristic of everyday work (16-19). The CART system provides an engaging and authentic learning activity and an in-class focal point that fosters a community of practice for paramedic students and also promotes peer learning by building relationships. In doing so, it promotes more seamless student participation during the social experience of clinical placement. In providing students with some of the shared understanding of expectations within the workplace, CART provides a 'key' that can assist them to access discussions with paramedics and therefore draw on their knowledge within the clinical placement setting. In a practical sense, the CART system can assist students with planning and preparation for clinical placements, which is critical for a positive experience (20).

One of the challenges in workplace transition is not having enough clinical experience (10) and increasing numbers of paramedic programs and students (2) have resulted in increased demand for services and contributed to growing pressure within the ambulance sector (5). Further, criticism remains of the level of preparation of graduates to undertake the role of a paramedic (21). Students and educators therefore need to capitalise on all available learning opportunities given the current placement shortages and changes to population health (4,7). The CART system demonstrated positive results in improving student familiarity with the workplace and therefore improving engagement on placements, consequently maximising value.

Extending this idea, it is argued that CART has the potential to contribute to assisting with transition into the workplace. Further, the principles underpinning the CART system could be used to mimic other aspects of the workplace and therefore make programs more robust in terms of their ability to provide consistent and reliable collateral support to exposures to the workplace. The use of a community of practice to simulate aspects of the work environment has potential to inform other innovations in paramedic education specifically and health education in general. This is critical in a climate of increasing workload demands on ambulance services (22), where a smooth transition to the workplace depends on skills and theory development during undergraduate programs (4) and when it is becoming increasingly competitive for graduates to find employment (23). Systems such as CART have the potential to give graduates a competitive edge in this context.

Evidence from this study indicates CART is a valuable initiative. Further research into its value and application is required to explore the connection between this classroom practice and learning on clinical placement. While all students on the CART campus used CART, information collected in this study was limited to first year students over one semester and provides some favourable evidence on the value of the system. A further limitation of this study is the cross campus comparison approach adopted. While some significant variances in the responses between campuses were noteworthy, it is acknowledged that experiences on different campuses are a product of multiple variables. Further research into the value of the CART system in improving student participation and understanding of workplace over the course of a full undergraduate program would provide further insight into the value of CART.

## Conclusion

The CART system is a simple and low cost strategy used to mimic equipment management practices used within the paramedic workplace. The system encourages students to work collaboratively and therefore fosters peer relationships by providing an engaging and authentic learning activity that instils an understanding of the cultural expectations of roles and responsibilities in the upkeep of essential paramedic equipment. The use of this system on one campus showed it can assist to foster peer learning and familiarise students with expectations embedded in workplace culture around the management of shared equipment. Evidence indicated that this made some students more comfortable with the expectations of them within the clinical placement environment. As familiarity with this integral element of workplace practice can assist with transition into the paramedic work environment, other classroom strategies that mimic workplace practices have the potential to assist students with transitioning to the workplace and optimise

learning opportunities in this space. Although evidence is yet to be obtained, it is arguable that a positive experience in the clinical placement environment has the potential to give students a greater opportunity to succeed once they enter the industry as employees.

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## Conflict of interest

The authors declare they have no competing interests. Each author of this paper has completed the ICMJE conflict of interest statement.

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