

Experiences of emergency care providers conducting critical care transfers in Gauteng Province, South Africa

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Background. Critical care transfer (CCT) involves the movement of high-acuity patients between facilities. Internationally, CCTs are commonly performed by a dedicated team using specialised vehicles and equipment. These transfers comprise a significant portion of the work of local ambulance services; however, there is a dearth of literature on current approaches and practices.

Objectives. To investigate and describe the experiences of a sample of Gauteng Province-based emergency care (EC) providers conducting CCTs.

Methods. A qualitative descriptive design used thematic analysis to gather data from 14 purposely selected participants during semi-structured focus group discussions, which were recorded and transcribed verbatim. Data were coded and analysed using ATLAS.ti to generate themes and sub-themes.

Results. The two dominant themes that emerged from the study were that there is no common understanding or clear definition of a CCT in the local context, and that systemic challenges are experienced. Participants indicated that their undergraduate training did not sufficiently prepare them to conduct CCTs. Local ambulance services appear to lack a common definition and understanding of exactly what constitutes a CCT and how this differs from 'normal' ambulance operations. Participants felt undervalued and poorly supported, with several systemic challenges being highlighted.

Conclusions. The absence of a contextually relevant definition of what constitutes a CCT, coupled with potential curriculum deficits in undergraduate EC programmes, negatively impacts on the experiences of EC providers conducting CCTs. Acknowledging CCT as an area of specialisation is an important step in addressing some of the frustrations and challenges experienced by EC providers tasked with conducting such transfers. Further research into formal postgraduate programmes in CCT is recommended.

Keywords. critical care transfer; paramedic; experiences; emergency care provider.

South Afr J Crit Care 2021;37(3):92-97. <https://doi.org/10.7196/SAJCC.2021.v37i3.487>

Contribution of the study. This study provides insights into the experiences of South African emergency care providers conducting critical care transfers (CCTs). The research highlights a need to develop a common understanding and definition accepted by industry of what constitutes a CCT and how CCTs differ from primary response incidents, including the need for additional education and a focus on the conducting of CCTs.

In resource-constrained African contexts, specialised human and technical resources capable of rendering high levels of critical care remain scarce. Current practices include consolidating and locating resources linked to the provision of specialised care at larger level 1 regional hospitals and facilities. These facilities (usually located in urban metropolitan areas) are generally better equipped to deal with complex cases than smaller outlying district hospitals and clinics. Nonetheless, high-acuity patients commonly access the healthcare system via lower-level facilities, including community clinics. In such instances, the level of care required may rapidly exceed the capability of the facility where they were initially admitted. Such circumstances necessitate an interfacility transfer to a step-up facility that would be better equipped to render the required level of care.^[1,2] High-acuity patients are often critically ill, and many have already been subjected to complex medical interventions. There is therefore a need to provide continuous critical care, advanced monitoring and organ support during the transfer.^[3,4] Such transfers are aptly named critical care transfers (CCTs) and may be conducted by ground or air ambulance services.

In developed healthcare settings, CCTs are mostly undertaken by highly skilled and experienced emergency care (EC) provider teams using dedicated specially equipped intensive care unit (ICU) ambulances.

Such teams are normally comprised of members with different areas of expertise, such as paediatrics, cardiology and anaesthetics.^[5,6]

While CCTs comprise a significant part of the work of South African (SA) ambulance services, purpose-built ICU ambulances are not available in all areas, and the majority of local paramedic education and training programmes do not focus extensively on equipping their graduates to conduct CCTs.^[7,8] This situation may explain anecdotal reports from EC graduates indicating that they feel less comfortable in undertaking CCTs than they do performing mainstream primary response duties. Despite these reports, no local or international literature could be found describing the experiences of EC providers involved in CCTs. This knowledge gap shaped the need for and purpose of this study. We investigated and described the experiences of a sample of Gauteng Province-based EC providers related to their conducting of CCTs.

Methods Study design

A qualitative descriptive design using thematic analysis was performed to explore and describe the experiences of participants, all of whom were routinely involved in CCTs.^[9-13]

Study setting

The study was conducted in Johannesburg, Gauteng, SA. There are limited specialised ICU units in SA and the majority are in metropolitan areas. Gauteng-based EC providers, including our participants, routinely perform CCTs to and from healthcare facilities in the province.

Research participants

In SA, CCTs of high-acuity patients are commonly conducted by advanced life support (ALS) providers.^[7] The professional registering body in SA, the Health Professions Council of South Africa (HPCSA), further distinguishes between different ALS providers, allowing for registration on one of two registers (paramedic and emergency care practitioner (ECP)). Therefore, to perform CCTs, an ALS provider can either be qualified as a paramedic or an ECP. Paramedics can further be described as EC providers who have completed either a certificate course (Critical Care Assistant (CCA)) or the Diploma in Emergency Medical Care. ECPs, however, are EC providers who have completed a 4-year Bachelor's degree in emergency medical care.

As paramedics and ECPs are both considered capable of rendering ALS treatment, both cadres of EC provider are currently used to facilitate CCTs. Therefore, in terms of this study, the 'population' may be cadres of prehospital ALS providers undertaking CCTs in Johannesburg. Our participants were purposely drawn from this population, as they were (at the time of the study) ALS providers from both private and public ambulance services with experience of conducting CCTs of high-acuity patients. In selecting participants, the following inclusion criteria were applied:

- Participants had to be qualified as ALS providers, either as paramedics or ECPs, and registered as such with the HPCSA.
- At the time of the study, participants must have been routinely involved in CCTs of high-acuity critically ill patients.

The sample for this study consisted of 14 ALS providers routinely involved in CCTs of high-acuity patients by road in Johannesburg. As mentioned above, our participants were a mixture of providers qualified as CCAs and ECPs from both public and private services. The 14 participants who agreed to participate in the focus group discussions had >80 years of combined experience, making them a source of rich and meaningful data.

ALS providers with limited training conduct CCTs of high-acuity patients in SA.^[2,7] The aforementioned necessitated making use of purposeful sampling to ensure sources of rich and meaningful data. Limited healthcare resources solely aimed at CCTs further supported the sampling method and identification of participants for the focus group discussions.^[9] Participants who were routinely involved in CCTs were purposely sourced from private and state-funded emergency medical services (EMSs) and invited to participate in the study.

Data collection tool

The data collection tool consisted of two focus group discussions, which did not have a set agenda or predetermined questions. The agenda was framed around a central opening statement, which was followed up with probing questions. The interview was pre-piloted on a group of four experienced EC providers who did not form part of the sample. All participants in the pilot study met the inclusion criteria. The aim was to test the agenda to see if the statement and opening question would be clearly understood and if the time allocation was sufficient. The data from the pilot focus group discussions were not used in the study.

Following the pilot study, our central opening statement became: 'CCT of high-acuity critically ill patients is seen by many as a specialised

field and should be performed by highly trained crews using specialist equipment on a specialised vehicle.'

This was followed by a core open-ended question: 'Please share with me some of your views and experiences relating to your participation in CCTs.' Where necessary, the principal investigator (PI) made use of probing questions to explore participants' responses in greater depth.

Procedure

An initial invitation email was sent to prospective participants, which contained information regarding the study, including participant right to withdrawal without consequence. Responding participants were then formally invited to focus group discussions on the most suitable dates. Two such discussions were conducted. Focus group 1 comprised 6 participants from the private sector and focus group 2 comprised 8 participants from the state sector. Each focus group discussion was held on different dates at the same suitable venue.

The two discussions took place in a boardroom in Johannesburg on 18 and 20 February 2019, respectively. These discussions were audio recorded using an electronic recording device (MP3 IC Recorder) (Sony, China). The durations of the focus group discussions were 39 and 50 minutes, respectively.

Data analysis

Focus group discussion recordings were transcribed by a professional transcription service (www.toptranscriptions.co.za) that entered into a confidentiality agreement with the PI to ensure data security. Transcriptions and recordings were perused thoroughly by the PI to ensure adequate immersion into the data. Where relevant, editorial corrections were made to maintain correct medical terminology. Computer-assisted qualitative data analysis software (CAQDAS) (University of Surrey, UK) was used to facilitate more efficient data organisation and analysis. ATLAS.ti 8 (ATLAS.ti, Germany) analysis software was used to analyse and code the transcribed data. Data were coded and analysed following a process of thematic analysis using inductive coding. Data were grouped into logical and similar themes.^[10] The coding process followed the suggested method of Tesch and Creswell, where first-pass coding saw the transcriptions of both interviews coded separately and compared for similarity and emerging themes.^[14] Similar codes were combined, as no unique codes or themes emerged in either of the focus group discussions. A code-recode strategy was followed to ensure further trustworthiness of the data.^[11] The second-pass coding from the combined codes, common themes and sub-themes were identified and are discussed in the results section.

Trustworthiness

Trustworthiness of information was ensured through adherence to strategies, such as credibility, transferability, dependability and confirmability.^[15-18] Transferability and confirmability were guaranteed by acknowledging the different domains of CCTs, being aware of investigator bias, using direct quotations of participants and keeping an audit trail.

To ensure the credibility and dependability of the results, all participants met all the requirements, all were suitably qualified as ALS providers and a pilot interview was done to finalise the agenda used in both of the focus group discussions.

Ethical considerations

Ethical clearance for the study was granted by the University of Johannesburg Research Ethics Committee (ref. no. REC-01-126-2017). Written permission was obtained from the relevant employers to

approach potential participants. Participants were required to sign consent to take part in the focus group discussions and to be recorded, after which the interview commenced. All data were treated confidentially; consequently, the participants, as well as the services they worked for, remained anonymous. Participation in the study was voluntary and participants had the right to withdraw at any time.

Results

Two dominant themes emerged from the data. Theme 1 related to a perception among participants that there was a poor understanding of what constituted a CCT and how this differed from ‘normal’ ambulance operations. Theme 2 related to participants experiencing several systemic challenges related to performing of CCTs. These experiences left them frustrated, undervalued and poorly supported. The themes are described in more detail below, with selected quotations from the raw data (Tables 1 and 2).

Theme 1: There is no common understanding or clear definition of a CCT in the local context

Participants shared their views that there was no common understanding in the industry regarding exactly what constitutes a CCT and/or how it differs from a normal frontline emergency response call/incident. Participants expressed concern that CCT was not viewed as a specialisation and that ambulance services often expected CCTs to be facilitated by

crews without the required experience or equipment. Participants felt that this situation was unacceptable, given the high acuity of patients and requirements for ongoing continuity of critical care already initiated. Participants mentioned increased incidences of adverse events during transfers, which they felt were due to deficiencies in their undergraduate education and training regarding specific skills and specialised equipment required to perform CCTs. This led to them lacking confidence and feeling stressed and underprepared to conduct CCTs on graduation.

Theme 2: Systemic challenges are experienced when conducting CCTs

The lack of a clear definition regarding the manner in which CCTs differ from normal interfacility transfers and primary response calls appeared to create a number of systemic challenges, including:

- Participants felt that they were not seen as valued members of the healthcare team responsible for the patient.
- The role, scope of practice and clinical capabilities of EC providers were not well understood or appreciated by doctors and nurses at referring and receiving facilities.
- Participants experienced a shortage of appropriately qualified crew members to support them in the rear of the ambulance during a transfer.

Table 1. Theme 1 with sub-themes and supporting quotes from the transcripts

Theme 1: There is no common understanding or clear definition of what a CCT is in the local context

Sub-theme	Selected quotations
Lack of a comprehensive definition of CCT in the local context	‘There is no definition ... no differentiation between a interfacility transfer and a critical care retrieval.’ (P9)
Lack of standardisation	‘No concept of understanding what equates to critical care.’ (P9) ‘Because there’s no standardisation. In order to do this transfer, you must meet the minimum criteria ...’ (P10) ‘You are actually opening yourself up to medical-legal litigation if you allow a patient with X, Y and Z wrong, to be transferred by a company that cannot provide A, B and C.’ (P9)
CCT not considered a specialty	‘They’re underestimating what is critical care retrieval.’ (P10) ‘... they think it’s rocking up with a ventilator and a monitor.’ (P10) ‘It has to be a specialised vehicle, and there has to be specialised equipment.’ (S2)
Poorly prepared, lacks confidence and feels undervalued	‘Where the ventilator settings have been messed up, now you have to change it, but you’ve never actually done it ...’ (P12) ‘Realising you don’t know, realising you don’t know what you don’t know is the most terrifying feeling ever.’ (P9) ‘I think, yes, I think it must start with recognition. Just being able to say this person is actually different to this person.’ (S8)

CCT = critical care transfer; P = private sector focus group participant; S = state sector focus group participant.

Table 2. Theme 2 with sub-themes and supporting quotes from the transcripts

Theme 2: Systemic challenges experienced when conducting CCTs

Sub-theme	Selected quotations
Shortage of appropriately experienced and qualified crews	‘If you’ve got a bariatric ICU [intensive care unit] transfer ..., it’s done by the same crew who will then turn around five minutes later and do a 400 gm neonate.’ (P9) ‘In private and in state, there aren’t many resources to do this.’ (S8) ‘So which patients are we sending to whom?’ (S8)
Hospitals had unrealistic expectations related to the acuity of patients	‘... they just want to remove the patient, irrespective of what condition they’re in ...’ (S7) ‘... whereby the doctor insisted that the patient must be moved with CPAP [continuous positive airway pressure]. It took us a day to move, something like eight hours.’ (S4) ‘As soon as you walk in it’s your patient ... then they will step back.’ (S4) ‘... the transferring hospital, they always like to rush us. Like when you get there, they’re like here is the patient, the patient is fine, you can go ...’ (S7)
Delays as a result of handover and hospital readiness	‘You spend about an hour trying to figure it out, where should I take this patient?’ (S3) ‘Because obviously there’s no ventilator and they’re relying on your ventilator.’ (S3)
Communication breakdowns between facilities, call centres and the CCT practitioner	‘I found it to be very erratic. There would be one day when you get all the information that you need, and then the next day you would be activated with an IFT (interfacility transfer) with the bare minimum.’ (P12) ‘So it’s like which is the receiving hospital? This hospital is on divert; this ICU is full. You’ll stop at two or three hospitals for diversion notes.’ (S1) ‘From the transferring hospital, a lot of doctors tend to not put all the information so that the patient can be accepted at the receiving hospital.’ (S7)

CCT = critical care transfer; P = private sector focus group participant; S = state sector focus group participant.

- Hospitals had unrealistic expectations related to the acuity of patients deemed appropriate for CCT, i.e. patients who were ‘unstable’ and who were at high risk of deteriorating were expected to be transferred.
- Unnecessary delays in completing a transfer were experienced as result of poor handover, lack of hospital readiness and general communication breakdowns between facilities, call centres and the CCT practitioner of the ambulance.

Discussion

In SA, CCTs are commonly conducted by ALS providers.^[1,2] In the developed world, CCTs are usually undertaken by highly skilled and experienced EC providers using dedicated specially equipped ICU ambulances. While there are clear and obvious differences between a CCT and a normal ‘frontline’ ambulance call, the degree to which local ambulance services appreciate such differences is questionable. These differences were reflected in our participants’ opinions on the emergency services industry not fully understanding what a CCT is or what is required to conduct a CCT safely. The lack of a contextually relevant and universally accepted definition of a CCT results in a lack of standardisation of local CCT practices and support for the ambulance crews.^[7,8]

There seems to be ongoing confusion and debate as to whether the patient requiring transfer indeed warrants a CCT team, and if the team has the required qualifications, competencies, equipment and experience for the transfer. Internationally, CCT is usually reserved for high-acuity patients transferred between ICUs and is performed by specialist CCT teams.^[19-23] Such a situation leads to specific criteria having to be met before a patient is considered appropriate for CCT activation. Specific criteria include that members of the CCT team should have postgraduate CCT-related qualifications.^[8,22] In SA, there are currently no set criteria or postgraduate qualifications focusing on capacitating local EC providers to conduct CCTs. Our participants felt that their undergraduate training focused mainly on managing normal primary response calls and did not adequately prepare them for conducting CCTs upon graduation.

A commonly understood definition for a CCT, together with appropriate inclusionary and exclusionary criteria supporting objective categorisation of patients who are eligible for CCT, may result in better optimisation of the limited CCT resources available. Local EC providers involved in CCTs may then also feel more valued. We note the recent work done in the domain of CCT standardisation in SA; however, it would seem that the results and recommendations have yet to be acted on.^[22]

Another challenge experienced by participants focused on the provision of appropriate equipment and skilled crew members to support them in the rear of the ambulance during a CCT. Again, this may be linked to the failure by industry to treat CCT as a true specialisation of prehospital practice.

A further possible reason for failure of CCT to evolve into a specialist practice locally, may be the lack of experienced and qualified individuals who are willing and able to continue practising in this area. Such shortages of skilled staff in the SA healthcare system are not new and are well described.^[1,2,20]

Additional systemic challenges identified in this study include inappropriately qualified call centre staff and poor screening of transfer requests. Therefore, local CCT teams are commonly dispatched to transfer non-critical patients. While the CCT team is occupied in dealing with the systemic challenges and lengthy delays described above, there may be a genuine CCT request. Because of a shortage of resources,

a normal frontline crew (who are less equipped to deal with such a transfer) is then dispatched to do the transfer.^[1,2] This situation creates obvious concerns around patient safety, as it has been shown that not using a suitably qualified team for a CCT increases the risk of adverse events.^[24] Such practices are not unique to the SA context, with some authors describing how a lack of CCT personnel may result in high-acuity patients being transported by non-CCT crews simply to ensure that they arrive at the receiving facility.^[1,2] The concern regarding this practice is that, despite their good intentions, the crew may be unable to render the required level of care and monitoring.

Our study also highlighted that the doctors and nurses at the referring and receiving facilities do not have a good understanding of the scope of practice and capabilities of prehospital EC providers undertaking the interfacility transfer. These circumstances are supported by other local studies that have shown that in-hospital staff generally have poor knowledge related to existing prehospital qualifications and scope of practice.^[24,25] Consequently, hospitals commonly request CCTs for patients whose ongoing care and monitoring needs far exceed the scope and capability of the CCT team.

The reported communication breakdowns between EMS call centres, staff at receiving and referring facilities and CCT ambulance crews are also not uncommon in a resource-constrained healthcare environment. Participants indicated that they were often ‘rushed’ by hospital staff and were not given appropriately detailed handovers. Incomplete handover has been associated with an increase in adverse events and is a known risk to patient safety.^[26]

Study limitations

Our study focused on describing the experiences of 14 Gauteng-based EC providers. The qualitative approach and regional focus show that similarities and differences may exist in other provinces and areas of SA. The self-reported nature of the data may have introduced participant bias and, considering the PI and the interview environment, desirability bias. Our study focused only on exploring participant experiences of road transfers with CCT ambulances and crews.

No demographic information was collected for a more detailed description of the characteristics of the participants routinely involved in CCTs.

ALS providers with limited training are available in SA to conduct CCTs of high-acuity patients. This limitation led to the small sample size of the study.

Recommendations

Further research is needed to improve the understanding and explore the systemic challenges and frustrations shared by our participants, including the need for formal postgraduate programmes focusing on improved preparation of EC providers to conduct CCTs.

Furthermore, the local EC industry should attempt to achieve consensus and more clearly define the scope and boundaries between an interfacility transfer and a CCT. This may assist in the acknowledgement of CCT as an area of specialisation and could become an important first step in addressing some of the frustrations and challenges experienced by local EC providers tasked with conducting CCTs.

Conclusions

A local CCT system has been described above, which appears to be in need of a significant rethink and overhaul. It has been shown that the management of high-acuity patients in continually resource-constrained environments is linked to suboptimal patient care, compassion fatigue

and interprofessional relationship strain.^[25] While CCT plays a vital role in the resource-constrained healthcare system, the absence of a contextually relevant definition of what constitutes a CCT, coupled with potential curriculum deficits in undergraduate EC programmes, has a negative impact on the experiences of EC providers conducting CCTs. Acknowledging CCT as an area of specialisation is an important first step in addressing some of the frustrations and challenges experienced by EC providers tasked with conducting CCTs. Unless the industry can improve the experiences, frustrations and lack of acknowledgement of those in the area of CCT, it will result in a constant turnover of staff. This is particularly problematic and unfortunate in an environment where undergraduate EC programmes do not sufficiently prepare graduates to confidently undertake CCTs and where the required confidence and competencies develop through trial and error over time.

Declaration. None.

Acknowledgements. The authors would like to thank all participants for the time that they devoted to this study.

Author contributions. ACGS and CV-L conceptualised the study. ACGS conducted the focus group discussions and analysed the data. ACGS and CV-L wrote the manuscript.

Funding. None.

Conflicts of interest. None.

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Accepted 18 August 2021.