Research paper

Relocating an intensive care unit: An exploratory qualitative study

Frances Fengzhi Lin RN, PhD [a,*],
Michelle Foster RN, MN [b],
Wendy Chaboyer RN, PhD [c],
Andrea Marshall RN, PhD [c,d]

[a] Centre for Health Practice Innovation (HPI), Menzies Health Institute Queensland, Griffith University, Australia
[b] Nursing Unit Manager Intensive Care Unit, Gold Coast University Hospital, Gold Coast Health, Southport, Queensland, Australia
[c] Centre of Research Excellence in Nursing Interventions for Hospitalised Patients (NCREN), Centre for Health Practice Innovation (HPI),
Menzies Health Institute Queensland, Griffith University, Australia
[d] Acute and Complex Care Nursing, Gold Coast Health, Australia

At the conclusion of this article a Continuing Professional Development activity is attached

ABSTRACT

Background: As new hospitals are built to replace old and ageing facilities, intensive care units are being constructed with single patient rooms rather than open plan environments. While single rooms may limit hospital infections and promote patient privacy, their effect on patient safety and work processes in the intensive care unit requires greater understanding. Strategies to manage changes to a different physical environment are also unknown.

Objectives: This study aimed to identify challenges and issues as perceived by staff related to relocating to a geographically and structurally new intensive care unit.

Methods: This exploratory ethnographic study, underpinned by Donabedian's structure, process and outcome framework, was conducted in an Australian tertiary hospital intensive care unit. A total of 55 participants including nurses, doctors, allied health professionals, and support staff participated in the study. We conducted 12 semi-structured focus group and eight individual interviews, and reviewed the hospital's documents specific to the relocation. After sorting the data deductively into structure, process and outcome domains, the data were then analysed inductively to identify themes.

Findings: Three themes emerged: understanding of the relocation plan, preparing for the uncertainties and vulnerabilities of a new work environment, and acknowledging the need for change and engaging in the relocation process.

Discussion and conclusions: A systematic change management strategy, dedicated change leadership and expertise, and an effective communication strategy are important factors to be considered in managing ICU relocation. Uncertainty and staff anxiety related to the relocation must be considered and supports put in place for a smooth transition. Work processes and model of care that are suited to the new single room environment should be developed, and patient safety issues in the single room setting should be considered and monitored. Future studies on managing multidisciplinary work processes during intensive care unit relocation will add to the learnings we report here.

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1. Introduction

Worldwide, ageing healthcare facilities are being replaced or refurbished to accommodate the changing needs of healthcare services including modifications to model of care, increased number of beds, technology advancements, and patient privacy needs.[1,2] Hospitals and clinical areas such as the Intensive Care Unit (ICU) are adopting the single patient room design instead of the traditional open environment with multiple patients in one room.[3] This shift in ICU architecture is likely because research suggests that the single room model reduces hospital acquired infection rates.[4,5] Environmental change to an ICU can include differences in the location of the hospital, the physical structure of the ICU, the model of care and work processes that are suited to the new environment.

* Corresponding author. Tel.: +61 414982782.
E-mail address: F.Lin@griffith.edu.au (F.F. Lin).

To understand the change management issues related to changes to the ICU environment the concepts of both *change* and *transition* may both be important. Change is considered to be about the outcome and is situational, which consists visible events that can happen quickly, for example, the move of the hospital will happen on the day. Transition is a process of how people prepare to go through the process and adapt to the environment, which is a longer process that extends from before to after the actual change.[6–8] Within the process of hospital relocation it is important to consider the transitional process of staff members trying to cope with the change from the old to the new environment.[8]

A strategic transition management plan is required to support staff to ensure a successful transition,[9] and to facilitate the continuity of quality care. Workplace culture, leadership, and organisational structure have significant impact on the process and success of relocation and staff transition.[10] In addition, relocation may cause stress and emotional strain to existing staff, and lack of necessary and timely education, support and communication regarding the relocation may create uncertainty and have the potential to impact teamwork and staff turnover.[10]

Due to the unique challenges of relocating an ICU, acuity of patients and array of therapies used in ICUs, it is reasonable to assume that the relocation of an ICU and subsequent transition of staff to a new work environment and model of care may be more complex than other departments of the hospital. However there is limited literature available that address issues related to the relocation of ICUs.

2. Aims of the study

The aim of this study was to identify challenges and issues of relocating to a geographically and structurally new ICU, from the perception of staff working in this clinical area. This paper reports Phase 1 of a three-phased project which was aimed to implement strategies to support the nursing service delivery during the ICU relocation process.

3. Study design

This was an exploratory ethnographic study underpinned by Donabedian's structure, process and outcome (SPO) framework.[11] Donabedian recommended that healthcare organisations' performances could be assessed in the domains of structures (facilities, equipment, personnel, and organisational structure), processes (what is done in providing care to patients) and outcomes (effects of care on patients and populations).

3.1. Setting

This study was conducted in a 15-bed, level 3 ICU (a tertiary referral unit which is capable of providing comprehensive critical care services)[12] of a 580 bed Australian tertiary teaching hospital. The study commenced 6 months prior to the relocation of existing health services to a new 750-bed hospital located 5 km away and built on a greenfield site. Changes to the ICU included a different configuration to the work environment where complete separate single parallel patient rooms in a pod of 10 were used as opposed to the previous predominantly open shared room model, where only 4 beds were single rooms. Critical care services were also expanded with the potential for 50 ICU beds, and new services including cardiothoracic surgery and children's critical care were added which requires the recruitment of suitably trained new staff, training of existing staff, development of new protocols, and variations to normal routines in order to provide safe patient care. Hospital relocation occurred over two days (27–28 Sep, 2013) with the ICU being

the last clinical unit to exit the old hospital. A relocation project team was established and planning for the hospital relocation commenced 2 years before the anticipated hospital move with specific planning for the ICU move commencing 12 months prior.

3.2. Participants

All staff working in the ICU including nurses, doctors, administration and support staff, allied health staff, and hospital relocation transition management committee members were invited to participate. In order to gain insight on what issues concern the nursing service delivery during the ICU relocation transitional period, a total of eight senior ICU nurses formed members of a reference group for this project where their role was to collaborate with the research team and identify key areas of inquiry to guide group and individual interviews. We invited non-nursing staff to participate the study because nurses work closely with other disciplines in ICU. These non-nursing staff will provide important insight on teamwork related nursing issues that needs to be considered during the ICU relocation.

3.3. Data collection

We used ethnographic data collection techniques including focus group and individual interviews as well as document review. A total of 55 participants, which included about 50% of the ICU nursing staff and representatives from other professional groups, consented to participate in the study. Table 1 shows the demographic information of the participants. Staff participants represented all age groups and role classifications of various professional groups. Among the participants, small number of staff had experience in paediatric ICU (7%), in ICU relocation (11%), and hospital relocation (18%). Twenty-two staff members (40%) had

Table 1
Participant demographic information (N = 55).

Characteristic	N	%
Gender		
Female	45	82
Male	10	18
Age (years)		
20–29	9	16
30–39	19	34
40–49	13	24
50–59	13	24
≥60	1	2
Employment classification[a]		
Grade 5 RN	29	53
Grade 6 RN	9	16
Grade 7 RN	5	9
Consultant	4	7
Other	8	15
Prior work experience[b]		
Paediatric ICU	4	7
Cardiothoracic ICU	22	40
Single room ICU	22	40
Relocation of hospital including ICU	6	11
Relocation of hospital but not relocation of ICU	10	18

[a] Grade 5 RN: bedside registered nurses; Grade 6 RN: registered nurses who are often in charge of the shift; Grade 7 RN: Registered nurses in management roles including Nurse Unit Managers, Clinical Nurse Consultants, or Educators; Consultant: intensive care medical specialists; Other: staff working in support roles such as ICU secretaries, and staff working in allied health roles including dietitians, physiotherapists, are included in this category. We did not list the sub categories in the table because some of the professional groups only had 1 participant which could potentially be identifiable.

[b] Staff prior experiences: some staff had answered "yes" to more than 1 categories, thus the total of this section is more than 100%.

Table 2
Internal hospital documents related in relocation reviewed by research team.

Name of document	Author of document
Floor plan of the new ICU	Hospital Relocation Committee
Photos of the new ICU	ICU management staff
ICU relocation plan	ICU management staff
Relocation operation manual	Hospital Relocation Committee
ICU education plan	ICU Educators
Cardiothoracic Service Implementation Strategy	ICU management staff
ICU move guide	ICU management staff

experience working in singe room ICU setting, and/or cardiothoracic ICU.

A total of 12 focus groups, each consisted of 4–12 staff members, were conducted by the chief investigator (as moderator) and a research nurse (as observer). Some focus groups were scheduled to accommodate staff who worked night shift. One focus group was specific to the hospital relocation project team members. Eight individual interviews were conducted with participants who were either unable to attend the focus group meetings, or where individual interviews were more appropriate. We also reviewed a number of hospital documents related to ICU relocation (see Table 2).

Group and individual interview questions were semi-structured with questions aligned to the SPO framework[11] and key areas identified from the reference group meetings. Example of questions included: (1) What aspects of your current work process will change in the new location? (2) What are the differences between the current and new environment? and (3) Is there anything concerning you about the relocation? All focus group meetings and interviews were audio-recorded and transcribed verbatim. All identifiable information was removed from the transcripts before data analysis which was conducted concurrently during the data collection.[13,14] Data collection concluded when ongoing data analysis indicated a thick description and clear pattern of the issues related to the ICU relocation, and no new issues were being raised from groups or individual interviews.[14,15] A data collection journal and a daily contact summary were used to ensure data integrity.

3.4. Data analysis

All focus group and individual interview transcripts and hospital documents related to relocation were entered into NVIVO version 10 (QSR International, Doncaster, Victoria, Australia) to assist with data analysis management. Data were first deductively sorted into three Donabedian's SPO domains.[11] After the first step, the contents in each domain were further reviewed, and inductive content data analysis was undertaken by reading within and across the initial domains to identify themes. Collected documents related to relocation were examined and analysed in relation to their purpose, dissemination pathway, and contents. Data triangulation techniques were used during data analysis to confirm, compare and contrast findings from different participants and different sources.[16] A data analysis report was generated in the end to ensure that all collected data were considered during data analysis. All research team members met regularly and reviewed the data analysis and findings including the final themes.

3.5. Rigour

We used data triangulation method, persistent data collection, and rigorous data analysis process which included analysing data concurrently with data collection, and discussing interim findings among team members and the reference group to increase the credibility of the study.[16,17] Fittingness, whether the study was meaningful for the participants, was evident. At the time of the study, it was recognised that many staff were apprehensive about the ICU relocation resulting in the nursing management team approaching the researchers to help with the relocation. By having a clearly documented study trail, field notes, and the data analysis process, auditability is enhanced. With enhanced credibility, fittingness, and auditability, conformability of the research is possible.[16,18]

The study was approved by the health service Human Research Ethics Committee (approval number: HREC/12/QGC/146), and ratified by the University (approval number: NRS/54/12/HREC). Written consent was obtained from all participants. Access to original data was limited to two investigators (FL and AM) who were not employees of the ICU to ensure that participants' confidentiality was maintained.

4. Findings

Data analysis revealed three themes: (1) understanding of the relocation plan; (2) preparing for the uncertainties and vulnerabilities of a new work environment; and (3) acknowledging the need for change and engaging in the relocation process. The following section describes the themes. Within the quotes from participants in this paper, *PPT*# denotes participant number; *FG* means focus group; and *INT* stands for interviews.

4.1. Theme 1: Understanding of the relocation plan

The majority of the focus group participants included nurses and doctors not in management roles. These participants described having very limited information and training about the relocation, a situation which was perceived as anxiety provoking. There was a perception that limited ICU specific information was available and that communication regarding the relocation was sporadic. A top down approach to disseminating hospital planning information occurred, with the hospital project team communicating information to departmental leads (Medical Directors and Nursing Unit Managers), then from departmental leads to staff working in the departments. Although information was provided in organisational level communication structures (e.g. intranet and newsletters) many participants were unaware of the process for providing feedback or asking questions. This was perceived to be a challenge for departmental leads as most of these staff was still carrying on their normal roles while managing this complex change process. Similarly communication to ICU staff was described as being limited, predominantly verbal and ad hoc despite information being disseminated via email and the ICU computer shared drive. This information was accessible from work computers only with access from outside the organisation not possible. This restricted access may have impacted information flow because most nursing participants claimed that they were too busy to check their emails or the shared drive for relocation information at work. Being able to access information from home and having regular scheduled information sessions were suggested as helpful strategies to improve communication however this function was not available within the available structures and processes.

The perception of the majority of participants was that they had limited understanding about the ICU relocation plan which included such things as orientation to the new ICU and training for new equipment. While processes were in place for staff to view the new location, ICU orientation to the new location was perceived as suboptimal with one participant saying *"we're having difficulty booking in a tour* [*of the new ICU*]. *They're apparently oversubscribed*
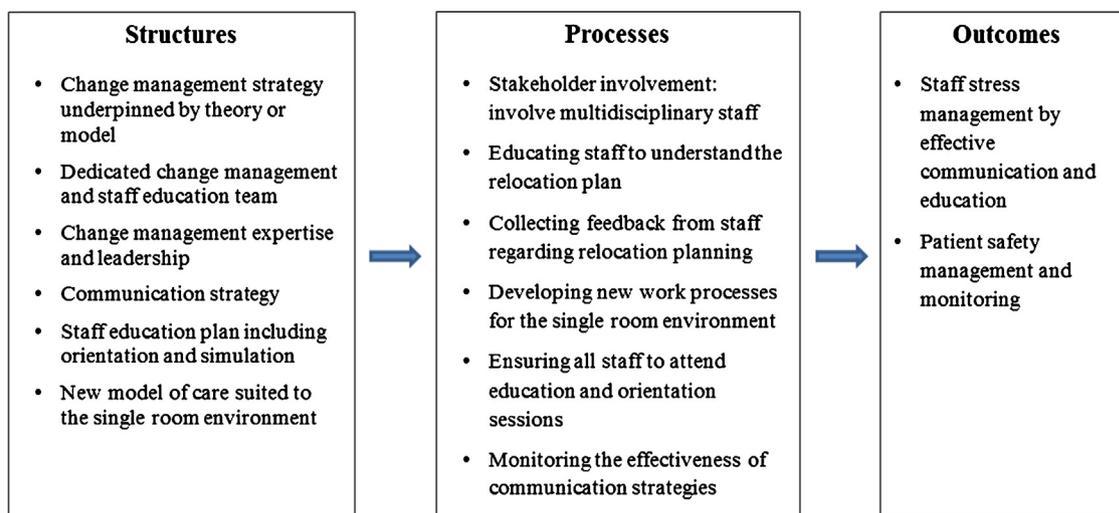
Fig. 1. Participants' recommendations on ICU relocation management strategies under structure, process and outcome categories.

so I'm trying to organise that but it's not looking good" (PPT#62 FG). This is in contrast to the claims of the hospital relocation project team participants who reported that "*tours to the new hospital were often under-booked and it's always the same people from the clinical areas coming on those tours*" (PPT#31 FG).

4.2. Theme 2: Preparing for the uncertainties and vulnerabilities of a new work environment

Participants, including nurses and doctors, perceived the new work system to have a number of uncertainties and vulnerabilities. This was mentioned in all focus group and individual interviews. Participants felt unclear about what impact the relocation may have on ICU work processes, such as communication, emergency procedures, staffing levels, how bedside nurses get help, and junior staff support. One nurse participant said:

> *I think it worries me whether enough preparation or awareness of how the new single rooms layout is going to work. I don't think that people . . . quite grasp the fact that you'll be working on your own and how much we do rely on people walking past or people work next to us. PPT#43 FG*

This uncertainty was perceived to contribute to the high level of anxiety among participants. In addition, the uncertainty, combined with limited communication about the relocation, and changes to the relocation dates, were perceived to "*feed the fear*" (PPT#15 FG) about working in single rooms. The hospital relocation project team participants acknowledged that "*much planning had been focusing on the actual move day and logistics, and not much on human psychology*" (PPT#30 FG).

Patient and staff safety concerns in a single room setting were perceived as vulnerabilities of the relocation. Consistent concerns were voiced about patient safety and there was a belief that, when nurses caring for patients in the single rooms could not get the help they need, the use of sedation and physical restraints would increase to prevent adverse events such as self-extubation. Staff safety was also highlighted as an important issue especially when nursing patients who might become aggressive as sedation is reduced. Supervision of less experienced nurses was also highlighted as a challenge in the single room environment. Participants thought that the assistance from nurses working in close proximity in the shared room model would be lost following the move to the single room environment.

4.3. Theme 3: Acknowledging the need for change and engaging in the relocation process

Participants acknowledged that there would be a period after moving into the new unit for staff to adapt to the new environment. One participant said that "*it's just like moving into a new home. You can never prepare yourself enough . . . it'll take some time, like 6 months for you to gradually work everything out*" (PPT#28, FG). Participants with prior experience in ICU relocation felt positive about the relocation, and understood that change would be needed for the new environment and supported the notion that the care delivery model needed to change to accommodate the physical structural change of the new unit. Reconceptualising the roles and responsibilities of multidisciplinary team members was also considered important after the relocation.

Many participants expressed interest in being involved in the relocation planning, however, up to the time of this study, most participants whose primary role was providing direct patient care stated that they had limited involvement in the planning. Engagement with relocation planning was contingent on recognising and being aware of opportunities. The perception that information was limited about relocation planning while at the same time it appeared participants did not actively seek information through formal communication channels (e.g. intranet, shared drive) and similarly were unlikely to approach leadership teams when they had questions about the relocation. While some participants expected that information be provided directly to them, several others commented that the responsibility for accessing information was with the individual and that "*staff needs to take personal responsibility to access relocation information. This is not something that management have to do*" (PPT#60 INT).

Participants suggested strategies that may assist with managing the relocation process. The strategies were grouped using the SPO domains (see Fig. 1).

5. Discussion

Hospital relocation is considered one of the most complex change management projects.[1,8] The relocation of this ICU, considering the significant change of physical environment, meant changes to work processes were inevitable. Our discussion about the issues related to this ICU relocation was developed according to Donabedian's SPO domains.

A relocation management strategy should be underpinned by a change management theory or model, such as Kotter's eight steps to change,[19] Bridges' transition model,[8] and Lewin's change management model,[20] to name a few. Common to these approaches/models is the focus on engaging those who will be affected by the change early in the process, allowing them to have input into the strategies to facilitate the change, ultimately ensuring the change will be accepted and sustained in clinical practice. While Bridges' transitions theory[8] can help managers to understand the transition process, a clear change management strategy can support the transition process.[17–20] In addition, change management leadership and expertise should be available to support the transition at the hospital level and departmental levels.[19] There are many change management models available in the literature, but as Mathews[6] argued, each of the models has their strengths and weaknesses, and the managers with change management expertise should choose one that is suitable for their unique needs to manage the transition.

5.1. Structures

A dedicated team, change champions and clear communication strategy are important structures recommended for organisations going through change.[2,6,21] In a study on hospital relocation in the United States, structures including employing a transition planning consultancy firm, having clear leadership, and dedicated task force on relocation throughout the hospital and departments were found to be essential for successful hospital relocation.[1] In our study all staff members managing the transition at departmental level were undertaking this role in addition to their existing responsibilities, and little dedicated time for change management was allocated. Effective communication was highlighted by some participants as lacking and it is recognised that effective communication requires time and planning. The results highlight that although existing communication strategies were in place they were not necessarily considered effective by all participants. Consequently ongoing evaluation is essential to ensure the effectiveness of communication structures. Findings suggest that under a well-defined relocation structure, early and effective communication processes needs to be in place to achieve a smooth transition.[1]

A new model of nursing care may be needed for the new work environment. Model of care in nursing refers to an organisational model which formalises the processes of nursing service delivery such as strategies for communication and coordination[22] and how nurses organise their day to day work, including staff and patient allocation and work processes.[23] One study found that nurses' workload increased when a hospital moved into a single room setting from shared room setting.[24] Although there is limited information available in the literature about ICU relocation, it is reasonable to assume that the change of physical structure in this ICU may have impact on staffing levels, staff allocation, and the way to provide support to bedside staff working in single rooms. As the participants identified, much of the help available from people working next to each other in the shared room model environment will be lost in the single room setting. Thus a new model of care may be needed for the new work environment of this ICU.

5.2. Processes

Multidisciplinary team engagement and helping staff members to understand the change plans are essential in change management. Bridges[8] suggests that a transition process has three phases: *ending, losing and let go* (phase 1), *neutral zone* (phase 2), and *the new beginning* (phase 3). In the beginning of a transition process, helping workers to let go of the old way of doing things is essential for the successful transition. For the ICU relocation, staff

acknowledged that changes to work processes would have to occur but "not knowing" what work practices would be required in the new single room environment contributed to a feeling of uncertainty and apprehension. The transition process must be considered so the staff will move on, let go of the old ways of doing things, and look for new ways of adapting to the new environment. Planned sessions with all staff to discuss the issues and challenges of relocation and identify required changes will assist staff to let go of the old and prepare for the next step.

Adequately preparing staff for the relocation during the time leading up to the actual move day was also important. According to Bridges,[8] this is *the neutral zone*, an in-between time when the new way of delivering care is not yet fully functional[8] and is considered "dangerous" if individuals are not prepared adequately for the change. This phase also provides the opportunity for organisations to identify areas of change and realign themselves with the change requirement. Clearly communicating the change plans and encouraging staff to ask questions, a process of working with staff on developing change plans, educating staff via simulation, and dedicated time for orientation were found to be effective strategies to facilitate this phase.[6,25,26] In this ICU relocation process engaging staff to work together to develop new work processes may be helpful to alleviate the fear and anxiety among staff.[1,6,27]

Involving staff to develop new work processes that are suited for the new work environment is considered to be an effective strategy to prepare staff for the change.[19] Bridges suggests that when people are already in the new situation, they need to develop new identities and discover a new sense of purpose, *the new beginning*.[8] Helping people move from the *neutral zone* to the *new beginning* phase, change management strategies involve continued planning and monitoring the effectiveness of the new processes, receiving regular feedback and sustaining change.[1,6,19] Thus in ICU relocation, it would be beneficial for newly developed model of nursing care and work processes to be trialled using simulation programmes to ensure their effectiveness, and continuously collecting staff feedback to guide improvements after the relocation. In this study, most of the participants acknowledged that there would be transition period between the time they moved into the new location to everything is fully functional. This acknowledgement shows positive energy which can be steered towards a smooth transitional planning.

5.3. Outcomes

Organisational change can cause staff stress, confusion and turnover.[8,20] In addition, there is limited understanding on how to manage the transition process to a new physical environment including how to support staff through developing and implementing new models of care best suited to the new physical environment. Ensuring patient safety must be the focus of the change management process and patient safety in the single room environment must be continuously monitored. In this study, while patient safety during the move day was well planned and some strategies, such as staff meal relieve and staffing were considered, the work processes post move and transitional issues still needed more work. The possibility of increased staffing needs for the single room setting,[24] coupled with the obvious isolation issue for nurses, indicate that developing new model of care and work processes is crucial to ensure patient safety and to reduce unnecessary staff stress and dissatisfaction.

6. Limitations

This study was conducted in one ICU and therefore the findings we report here will be specific to this environment. However,

lessons learned during the transition to a new clinical environment may provide important insights for others who are involved in transitioning nursing care from a shared room setting to single room settings. In our study, although all clinical staff were represented as participants, we focused specifically on issues which concerned nursing work processes. Future studies focusing on all multidisciplinary change management processes is needed.

7. Conclusion

This study suggests that a systematic change management strategy, dedicated change leadership and expertise, a clear plan for staff training, and new model of care are important structures that need to be in place to manage the ICU relocation. Processes should be considered in the ICU relocation include communicating relocation plans effectively and transparently, helping staff to engage with the relocation planning and developing new work models for the new environment. Patient safety in the single room setting should be considered. Future studies on managing multidisciplinary work processes during ICU relocation are needed.

Authors' contributions

All authors listed have contributed to the conception and design of the study, acquisition of data, analysis and interpretation of data; drafting the article, revising it critically for important intellectual content; and final approval of the version to be submitted. All those entitled to authorship are listed as authors.

Acknowledgements

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