Title: Using a theory driven approach to manage the relocation of an intensive care unit: An exemplar

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Develop and implement strategies to facilitate an intensive care unit relocation – an exemplar

Abstract

Proactive planning and managing moving from old to newly built hospitals and the relocation process of patients for complex specialised units such as intensive care units is necessary for both patient safety and staff well-being. This paper provides an exemplar for how theory can be used to facilitate a positive relocation experience. Using change management theory, a systematic approach to co-create interventions among researchers and clinicians were crucial to the success of this project.

INTRODUCTION

Refurbishment and relocation of hospitals is becoming increasingly common as a result of increased demand for more hospital beds and the need for updating the physical structure to accommodate modern healthcare infrastructure and patients' needs.¹ A notable change in the physical structural of new hospitals is the adoption of the single or private room design.

Within intensive care units (ICU), single rooms have also been adopted; a departure from the traditional layout where many patient beds are accommodated in an open space. The shift to a single room environment is largely influenced by the research findings that the use of single rooms in hospitals has been preferred by patients and their families as it provides better privacy and comfort and better patient outcomes such as fewer hospital acquired infections^{2,3}, although this latter benefit is debated.³ Improvement in the working environment for healthcare workers has also been reported as the result of a single room environment,² yet this is not consistently experienced with others reporting staff perceptions that single rooms to have a negative impact on teamwork, monitoring, and keeping patients safe.³

It is not uncommon for changes in the physical environment to occur alongside other substantial changes such as the introduction of new services, modifications to team composition and changes in organisational structure.⁴ These organisational changes, combined with the environmental change, have the potential to cause increased stress and anxiety for staff when transitioning from one work environment to another.⁵ As a result, systematic and strategic approaches to change management are recommended. Such approaches should incorporate a transition management framework to support successful transition and ensure patient safety during the relocation.⁶

For staff working in the ICU, transition to a new work environment, which may be accompanied by the introduction of a new model of care, may be more complex and challenging than other parts of the hospital because of higher patient acuity and the number

of staff members on duty at any one time. Hospital relocation and a change from an open plan to single rooms will also likely require staff to significantly modify their work processes.

³ Further, increases of bed numbers, as generally occurs when new hospitals are built means that there will also be an increase of new staff members working in the unit. Ensuring the large number of staff working on different shifts are informed about relocation plans throughout the process can be challenging. ³ Yet, to date, there has been little written about managing the relocation of intensive care services into a single room environment with few evidence-based recommendations for ensuring patient safety and facilitating transition for staff.

AIMS OF THE STUDY

Given the lack of guidance on managing the ICU relocation process in the literature, the aim of this paper was to describe a method that can be used to manage the relocation process, and present an example of how the method was used in our ICU relocation interventional study. The aim of the ICU relocation study was to develop and implement strategies to support the transition process of an ICU relocating from a shared room to a single room setting.

THEORETICAL FRAMEWORK

Two theories guided this study: Bridges transitions theory ⁵ and the theory of expansive learning. ⁷ Bridges ⁵ suggested that the transition process of organisational change can be very complex as people go through three phases: *(1) letting go; (2) the neutral zone; and (3) the new beginning* during the change process. Recognising the characteristics of each phase of the staff transition process and having a structured plan to support staff during each phase of the transition process is important. Involving staff in relocation planning is one way to alleviate the potential stress that the relocation could incur.

The theory of expansive learning,⁷ is an application of activity theory^{7,8}, which focuses on workplace learning and organisational change.⁹ In activity theory, the unit of analysis is the activity system of how humans carry out their everyday activities to achieve their desired outcomes. Complex organisational systems consist of multiple human activity systems that are intertwined. Humans develop their capability in the intertwined activity systems when they interact with others collectively in their environments. Managing organisational change is often aimed at finding resolutions for the tensions and conflicts in complex workplaces, but cannot be isolated from the social and historical contexts of the intertwined complex human activity systems. Workplace learning occurs when the redesign of certain work processes is required. It is a complex progression that needs the collective efforts of participants in the work system.¹⁰ The theory of expansive learning therefore proposes a continuous seven step process^{7,11} that appropriately aims to resolve potential tensions and conflicts that may arise in complex organisations.

In the expansive learning cycle, the actions to develop and transform a complex activity system from one to another goes through seven progressive steps. These include (1) questioning current practice, (2) analysing, (3) developing a new work model(s), (4) testing and revising the new model(s), (5) implementing the new work model(s) and monitoring progress, (6) reflecting on the implementation, and (7) consolidating and forming new practice. The earlier steps make the later steps possible but the cycle is iterative and there can be back and forth movements in the cycle. At the end of this cycle the practice is transformed to a higher and new level.⁷

In the following section, we explain what each of the steps involves, integrating this with Bridges' three transition phases and use our ICU relocation study as an example to show how we redesigned the work processes for the ICU relocation using the expansive learning approach. The relocation of an ICU requires the practitioners to redesign their work processes

for the new and different work environment so that patients are safe and quality of care is ensured. Using these theories together, can help to better manage both the specific situation of relocation process and also more generally when other work process require redesign.

METHODS

A mixed-method interventional study was conducted. The data collection for the development and implementation of interventions occurred from March 2013 to June 2014. The study was approved by the hospital and the university's ethics committees. All staff participated gave written consent.

Setting

The setting for this study was the relocation of an 580 bed Australian tertiary hospital with a 14-bed open plan ICU to a new site of a 750-bed hospital with an ICU with a capacity for 50 single room beds but with 21 open beds in September, 2013.

Sample

All ICU nursing staff were involved in the relocation process to varying degrees and all were invited to participate in the research. Eight senior ICU nurses formed a reference group supporting the study and collaborating with the research team to identify key areas of inquiry throughout the implementation process. The reference group was also instrumental in the co-creation of the intervention and implementation strategies.

Development of intervention and implementation strategies

The process of developing and implementing interventions in this study followed the expansive learning cycle ^{7,12} but was also informed by Bridge's transition theory. ⁵ Figure 1 shows the steps of how new work processes were designed and adapted.

Figure 1 Process of developing new ICU work model adapted from the expansive learning cycle ¹³ and the transitions theory ⁷

Step 1 – Questioning

In the first step, ‘Questioning’ of the current ICU situation and the need for change occurred⁹ and typically involved meeting with the staff of the ICU to gather information and help the researchers understand current ICU work practices and hospital processes. This heralded the beginning of the ‘letting go’ phase in the transition process for staff.

About 12 months prior to the ICU and hospital relocation (which occurred simultaneously), we (the researchers) were approached by the ICU nursing management team to help manage the transition process. After initial planning and ethical clearance, about six months prior to the relocation, focus group meetings and individual interviews with medical and nursing staff were conducted to identify factors that may contribute to uncertainty in clinical practice which may impact on patient safety associated with the ICU relocation. The findings from this step suggested that: (1) strategies need to be in place to help staff to *understand the relocation plan*; (2) a dedicated team is needed to develop work processes *to prepare for the uncertainties and prevent vulnerabilities of a new work system in the new environment*; and (3) staff need to *acknowledge the need for change and engage all staff in the relocation process*.

Recommended strategies to improve the relocation management were identified and classified using Donabedian’s framework¹³ for quality in health care including: structures (engaging a change champion, establishing a working group and redesign the ACCESS nurses’ role), processes (having dedicated communication and information dissemination strategies for the relocation, simulations, and monitoring staff behaviour change in the new work model), and outcomes (changed work systems and structures, staff engagement and recognition). ACCESS nurse is a position for registered nurses who were in staff support

roles and did not have a patient load during their shifts. ACCESS stands for Assistance, Coordination, Contingency, Education, Supervision, and Support.

Step 2 – Analysing what work processes needed to be redesigned for the new environment

Analysing what work processes needed to be redesigned for the new environment was also part of the ‘letting go’ process. The research team and the clinical reference group worked together to carefully considered the issues identified in the first step to better understand the current work processes and the changes required for the new work environment. Solutions to solve the issues were proposed and discussed with the staff in the hospital with the aim to make sure the work activities are focused on the new objectives in the new environment.¹⁴ The active participation of the ICU nursing reference group in the analysis process provided the research team with a real world understanding of the problems to be addressed.

Two months prior the relocation, a dedicated “relocation working party” was established. This group primarily analysed the work processes needed to be changed or redesigned for the relocation. All staff working in the ICU were invited to submit an expression of interest to be involved in the working party. Members were subsequently selected based on their expertise with consideration given to ensure adequate representation of nursing staff from different levels and positions in the ICU. Supporting patients and nurses at the bedside was identified as the new objective. Improving communication and disseminating relocation information to bedside nurses were identified as two main priorities. Work processes that needed to be redesigned were identified as: (1) supporting staff, especially junior staff when working in single rooms; (2) process for restocking equipment in patient rooms; (3) staff meal break relief patterns; and (4) team communication methods. Creating an urgency to change as part of the letting go process was also identified as important to help staff to shift their focus from

the negative feelings associated with the move to actively engaging them in the change process.

Step 3 – Developing a new work model for the new single room environment

Informed by the work in steps 1 and 2, the research team and the relocation working party co-created and tested a new work model to address the issues and priorities identified.

The new work model was labelled “transforming SAFE patient care in SINGLE ROOMS” (SAFE SINGLE ROOMS) with a strong focus on ensuring the safety of the patients and supporting the bedside nurses working in single rooms. To ensure that information was communicated to all staff, a social networking analysis ¹⁵ was undertaken. It is a method used to investigate how people in a group communicate and where they source information. ¹⁵ Questions such as where/who nurses prefer to get relocation information were asked, and then they were asked to rank in priority their responses. From the network analysis, the nurses who were identified as having strong social networks (i.e. had many other nurses identifying them as the source of information) were provided with information. As a result, all information related to the relocation was disseminated to these staff members who could facilitate optimal information sharing among all staff. A regular newsletter, change champions’ constant presence in the unit to answer questions, and a planned information dissemination method were used as strategies to help staff understand the relocation plan throughout the entire process. In addition, the letting go of Bridges’ transitions theory ⁵ informed the drafting of key messages in the initial newsletters, which also acknowledged that feelings of unease or anxiety amongst staff members is commonly experienced during periods of change.

Concurrently, the research team, the clinical reference group, and the relocation working party redesigned work processes to ensure bedside nurses were supported during their work.

Due to the constraints of the single room design in the new environment (i.e. walls separating bed spaces), staff caring for patients that were next to each other could no longer relieve one another if they needed to leave the bedside (for example to get equipment or taking a meal break), which had been possible in the shared room setting. A meal relieve plan was designed the incorporated using ACCESS nurses and other management staff to relive bedside nurses for breaks. A worksheet template was designed for the ACCESS nurses to document their work plan during their shifts which they were able to use to remind themselves to check on staff who needed assistance. Additional equipment stock trolleys were procured to ensure that nurses working in single rooms could stock their rooms whenever required without leaving the patient alone or having to ask others to help observe their patients during their absence.

Step 4 – Testing and revising the new model for the single room environment

Testing and revision is an important step/process in work process redesign and involves an analysis of what worked and did not work, and subsequent revision. Thus, during the initial implementation of the SAFE SINGLE ROOMS model, the implementation strategies were analysed.⁹ In this step, pre-move simulations in the old ICU were conducted to test the redesigned work processes before the relocation occurred. This included single room simulation (draw curtains around each patient's beds to simulate a single room environment), meal relieve/break pattern simulation, and the ACCESS nurse rounding model simulation. A research assistant was based in the unit while the simulation occurred, and collected qualitative data on the simulation to inform any revisions that may have been required.

The purpose of this step was to facilitate the staff members' transition from the first phase of "letting go of the old things", to the next phase - the "neutral zone" – where staff would be required to realise that change was unavoidable and thinking about the relocation and how to act in the change process, would be necessary⁵. The nurses initially showed extreme

frustration during the single room simulation with comments such as “The single room is never going to work”, and “We rely on people working next to us to help with patient care and relieve for breaks and this will be lost in the single room setting”. This simulation forced the bedside nurses to face the reality of the upcoming relocation. This ultimately helped them to consider what could be done to cope with the change (moving into the neutral zone). Soon after the pre-move simulation, some behaviour change was observed. Nurses started asking questions instead of waiting for information to be provided to them. The research assistant received many queries regarding relocation and nurses began discussing what they could do to overcome issues with the single room setting.

ACCESS nurses used the Rounding Template to help support staff and meal break relief during their shifts. The ACCESS nurses found that the template was helpful for them to keep track of the support they were providing to bedside nurses allocated to them at the beginning. They reflected that they did not need to use the template after a couple of weeks of using it as they established a habit of rounding the staff regularly. Thus the use of the Rounding Template was left to the ACCESS nurses’ discretion. During the transition it was noted that the role of the ACCESS nurse needed to change from being the assistant of bedside nurses in patient care, to a higher level supervisory and support role. This was especially required when junior nursing staff were working in single rooms. In consultation with ACCESS nurses and the nursing management team suggestions on how to up-skill the ACCESS nurses were identified and implemented.

Step 5 – Implement the new work model and monitor process

Implementing the new work model (SAFE SINGLE ROOMS) and transforming clinical practices occurred next.⁹ Theoretically, actions in this step could involve formal monitoring

systems, and/or regular meetings among the management team. Addressing, resolving and monitoring arising issues and challenges are all important aspect of this step.

A month after the relocation and implementation of the SAFE SINGLE ROOMS work model a post-move survey was conducted to monitor the new work model. The purpose of this survey was to investigate the level of perceived support received by bedside nurses, and to provide evidence for the next step/phase in the process where we would review the implementation strategies. A 27-item questionnaire designed by the research team and the reference group, which included fixed response questions and open-ended questions, was given to bedside nurses to complete at the end of their shifts each day. Questions were asked about getting assistance for patient care, medication safety including checks, meal breaks, other short breaks, , room stock, and events that occurred during their shifts. Nurses were asked to provide a narrative to elaborate on their answer to some fixed response questions. The questionnaires were distributed to all bedside nurses during the post move period from November 2013 to February 2014. Informed by the findings from this post-relocation survey that highlighted issues such as the content stocked on the stocking trolley for single rooms need to be reviewed, and there were delays in bedside nurses getting help with patient care, revisions to the redesigned work processes were undertaken.

The research team and the reference team held regular meetings to discuss the implementation issues and revisions to work processes occurred when deemed necessary. All strategies including the regular newsletter, staff meal relief process, the ACCESS nurses work model and the regular meetings to identify issues to be addressed, continued as a part of routine practice.

Step 6 & 7 – Reflections on the new work model and consolidating practice to a new level

Reflecting on and consolidating the new practice, the last two steps, involved the formal evaluations of the new work model, conducted at different levels within the hospital.⁹ This reflection and consolidation aids in what Bridges terms ‘the new beginning’.⁵ After six months of implementation, final evaluations using focus groups and individual interviews with bedside nurses, the ACCESS nurses, and nursing management staff were conducted. They were asked about the new work models and whether they thought their new practices were effective or not. Based on the findings from step 6 and 7, revisions to the SAFE SINGLE ROOMS model was conducted and implemented. From these steps, it was clear the nursing staff viewed the relocation and the associated changes as the new beginning.

In summary, the expansive learning theory provided a framework to manage the relocation process and help staff transition from the ‘old way of doing things’ to a new work model.

Table 1 summarises the various components of the relocation intervention and implementation strategies that were used to facilitate the physical relocation and human transition.

Table 1 Components of the ICU relocation interventions

Interventions and their aim	Implementation strategies
Introducing a change agent:	<ul style="list-style-type: none"> • A part-time ICU nurse was employed as research assistant (RA) for an extra two days per week to work on this project and lead the change management teams. • Collect frequently asked questions and provide answers, and feedback on relocation progress.
Establishing a relocation working party: to discuss work processes that may change and plan for simulations/strategies	<ul style="list-style-type: none"> • Regular working party meetings (total of 8 meetings over 6 months attended by members and the research team). • Regular feedback meetings to reference group and management team by the RA.
Regular newsletter dedicated to relocation: to improve communication	<ul style="list-style-type: none"> • Contents of the newsletter collected from key stakeholders and staff by RA. • Email and hard copies to ensure thorough dissemination. • Regular publication during the research project (total of 8 newsletters total of 18 months). • Social networking survey was conducted and the results of the survey helped us to decide how information was disseminated.
Pre-relocation single room simulation: to create a sense of urgency and stimulate forward thinking about changing work processes.	<p>Trialled a “draw curtain between beds” in the old ICU 15 times, with all staff working in the unit participating on the days the simulations were conducted.</p>
Pre-relocation meal relief trials: to model post move support for bedside nurses	<p>Trialled meal relief patterns# in a simulated single room environment (nurses were not allowed to relieve each other for lunch. Only RNs who did not have a ventilated patient could relieve others for meal breaks).</p>
*ACCESS nurse rounding model pre-move simulation: stimulate thinking about how to support bedside nurses in the new setting, and trialling staffing levels	<ul style="list-style-type: none"> • Reviewing ACCESS nurses’ roles in the single room environment (increased leadership and supervision responsibility in comparison to the shared room model; taking up the role of a support person to bedside nurses). • Draft ACCESS nurse rounding model. • An ACCESS nursing rounding record form was trialled. • Meetings with ACCESS nurses and management team.
ACCESS nurse rounding model post-move revisions: to ensure nurses are supported at the bedside post move so nursing care can be carried out in time and as needed.	<ul style="list-style-type: none"> • ACCESS nurses hourly rounding model implemented and reviewed. Every five ventilated patients were allocated one ACCESS nurse to support the bedside nurses. • Regular meetings with reference group and ACCESS nurses.

Interventions and their aim	Implementation strategies
Continuously improving practice using the expansive learning cycle approach: to review the effectiveness of the interventions post move and make revisions	<ul style="list-style-type: none"> • The RA and chief investigator led the meetings with the nursing management team and reference group on how to monitor the post move strategies and how to identify issues and modify the strategies. • A total of seven meetings were held. • Post-move surveys and mini follow-up interviews were conducted. • Revision of strategies post-relocation: use of staff assist call buttons, clarification of what is an emergency, based on the findings from the post-relocation survey, and follow up mini interviews. • Changes to the implementation were communicated via the newsletter, in person and at meetings with key nursing staff. • Clarified roles and responsibilities within the multidisciplinary team. The waster bins is now emptied by cleaners which was done by nurses pre-move
Staff assist button use (findings from the post-move survey) to promote the use of staff assist button in the ICU, so bedside staff get the help they need quickly	<ul style="list-style-type: none"> • Clear message in the newsletter. • Support from management team. • Educating ACCESS nurses to encourage staff to use the staff assist button. • Educating all staff who did not have a patient load to respond to staff assist calls. • Discourage the use of phones to get help, as only one person can hear the phone, but many people can hear and see the staff assist call.

In Australia, critically ill patients admitted in ICU, such as ventilated patients, unstable patients, and unstable patients on dialysis have a patient to nurses ratio of 1:1. There must be a nurses watching these patients at all times. Therefore the nurses caring for these patients need to be relieved for breaks. *RA: research assistant=change agent.

DISCUSSION

Hospital relocation can be very complex and challenging to manage. Intensive care relocation is particularly complex due to patient acuity and multidisciplinary involvement in patients' care especially when it is coupled with both a structural change in the physical setting, such as the move from an open plan to single room, and an expansion of services such as from 14 to 21 beds. Current literature about hospital relocations is mostly reflective of the experience of the physical move, with limited information regarding intensive care relocation from a shared room to a single room setting. Thus, informed by two organisational learning and change management theories we developed a relocation management plan and a variety of specific strategies to help in this process. The new work models and its implementation strategies appears to have been successful because it: (1) was informed by theory; (2) used change management principles; and (3) promoted interaction between clinicians and researchers in the co-creation of the implementation strategies. Additionally, because the planning began before the move, data collection during the various steps was thought through and had the approval of the ethics committees.

Identifying and using a change management theory is important when managing change in large organisations. ^{4,16} Bridge's transitions theory ⁵ helped the researchers and the reference group nurses to understand the psychological phases of what staff were going through when facing the impending relocation, which was associated with a number of significant changes to the way people would work. Staff members' transitioned through the three phases of "letting go", the "neutral zone", and the "new beginning" by actively participating in designing and co-creating various strategies such as newsletters, the pre-relocation simulations and post-relocation implementation. Their focus shifted from resisting change to

actively engaging with and participating in the change process.⁵ For example, the pre-relocation simulations, although appearing a cause of frustration for nurses as indicated by the field notes, it did stimulate staff members' thinking and created a sense of urgency among them to actively consider what could be done to overcome the problems. Establishing a sense of urgency is thought to be an important and effective first step in successful change management¹⁶ and helps staff realise that change is becoming real and they need to consider letting go of the old ways of doing things.⁵ Urgency also encourages staff to be involved in change planning, which increases driving forces for change.¹⁷

The expansive learning theory guided the re-design of the work models in the ICU because it is an object-oriented theory which means identifying the new objective in the new environment is pivotal to the successful change management. That is, with clear objectives in mind, nursing staff in the ICU aimed to find solutions to resolve the conflicts and tensions formed in the development of the complex work environment. Identification of the new "object" (objective) and supporting patients and bedside nurses to facilitate the relocation was a key step in the expansive learning cycle.⁹ The design, testing and evaluation of the implementations in this study appeared to be effective based on changes in staff members' attitudes, which shifted from a resistant stance on the relocation to active participation in the study.

The core value of the expansive learning theory is about the co-creation of the new work model and implementation strategies among the researchers and clinicians. Other change management theories, such as Lewin's change model¹⁷ and Kotter's eight steps to successful change,¹⁶ also emphasise the importance of involving staff in the change management process. The strength of this study was that the will for a successful transition came from within. The ICU nursing management team sought help to manage the change process, worked with the research team closely, and led clinical meetings and discussions on change

management during the study process, with support from the research assistant dedicated to the project. Current implementation science literature suggests that when the clinicians are in equal partnership with the research team in clinical practice improvement, the change made will most likely be sustained.¹⁸

Having the Bridges' transitions theory and the expansive learning theory as theoretical frameworks was important in helping the researchers and clinicians to understand the transition process, and design new work models and implement strategies systematically. However, we observed that the length of time from the commencement of the study process to its evaluation was too short. We commenced the study six months before the relocation which was very late for developing a comprehensive yet feasible relocation management plan. In addition, due to funding constraints, we conducted the final evaluations six months after the relocation, which did not allow enough time for the new SAFE SINGLE ROOMS model and associated new clinical practice to consolidate. A longer time frame between the relocation date and the evaluation would have been beneficial and is an important consideration for future research in this field.

LIMITATIONS

This study was conducted in one ICU; therefore the findings may only be specific to this environment. However, the methods of redesigning work processes and monitoring outcomes in the transition process may provide important insight for others who are managing transitions that involve both physical relocation and expansion and require a changes to work processes.

In addition, we only focused on supporting nurses' work during the transition and did not implement strategies that involve staff from other disciplines. Had we had more time, we would have worked to involve other health professionals, both researchers and clinicians.

Given the multi-disciplinary team environment in the ICU setting, this may have resulted in additional ways to manage the relocation process.

CONCLUSION

This study is one of the few studies that investigated intensive care relocations, was planned a priori, and to our knowledge, the first study focused on designing management plan to support the transition from a shared room ICU to a single room ICU. The transitions theory helped us to better understand the psychological issues staff were experiencing and to design the implementation strategies accordingly. The strengths of this study is the development of the strategies was guided by both Bridges transition theory and the expansive learning theory, a workplace learning theory that promotes the co-creation of implementation strategies among researchers and clinicians by following the expansive learning cycle. The method we have presented can serve as an example for other clinicians and researchers in designing interventions to facilitate physical relocation and expansion and the resultant need for work process change.

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