Analysis of Mobility Practices in the Intensive Care Units at William Osler Health System

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EXECUTIVE SUMMARY

The intensive care unit (ICU) is a part of the hospital which deals with patients who are gravely ill and need extensive medical and nursing care. Historically, patients receiving care in the ICU were encouraged to remain in bed for their daily care. However, current research has emerged which shows that the early mobilization of patients in the ICU has a positive impact on health outcomes.

William Osler Health System (WOHS) is a large publicly funded community hospital situated at two different locations in the Greater Toronto Area. The administration identified a need to evaluate its current mobility program in the ICUs and develop a plan to improve patient care practices and decrease length of stay of patients in the ICU.

The deliverables of the project included the following:

1. Literature review of current and best practices regarding early mobilization in the ICU.

2. Analysis of current mobility practices in the ICUs at WOHS. This analysis will use a qualitative approach and will include a strengths, weaknesses, opportunities, and threats (SWOT) analysis of the ICU.

3. Review of comparable hospitals and current practices in those hospitals.

4. Recommendation of guidelines and key measurable outcomes.

5. Strategic plan regarding the implementation of solutions.

The methods required to achieve the deliverables included a thorough literature review on the topic of early mobility in the ICU; in depth interview of the client regarding WOHS structure and its ICU; an early mobility research questionnaire of physiotherapists at hospitals that are comparable in size and patient population to that of WOHSs; and an analysis of the above findings.

The results of the above illustrate the corporate and ICU structures of WOHS and include a detailed stakeholder analysis. It also shows how early mobility programs are structured in the comparative hospitals. Finally, it incorporates the best practices that were identified in the literature review.

The results also include a discussion regarding the strategic plan that WOHS should undertake and implement in order for a successful early mobility program. The strategic plan includes: improving patient care; decreasing length of stay; improving patients' functional status. Therefore the two main goals, improving patient care and decreasing their length of stay in hospital, were established together with the means of successfully achieving them.

By integrating the information gathered in the methods and analysis section a conceptual framework of early mobility is provided both in visual and written format. It illustrates the complex nature of early mobility and how it impacts patient care.

Recommendations are provided that can be implemented immediately as well as long term. These include:

1. Completion of the Organizational Culture Assessment Instrument (OCAI) and/or Organization Cultural Profile (OCP)
2. Enhancement of early mobility in the intensive care units
3. Team building
4. Outcome measures
5. Long term sustainability

In conclusion, early mobility in the intensive care unit is feasible and has been shown to have a positive outcome with respect to decreasing patient length of stay in hospital as well as improving patients' functional outcomes. By implementing early mobility in the ICU, WOHS can be a leader in changing the current culture of patient care and act as an ambassador to other Ontario community hospitals.

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INTRODUCTION

An acute care hospital provides health care in many different ways. This care can range from minor – the application of a bandage to a cut – to provision of life support to the most gravely ill. The intensive care unit (ICU) of a hospital provides care to patients who are critically ill and require the most complex medical assessments and treatments. Historically, the ICU environment and work culture have not been supportive of early mobilization. In most ICUs, patients are treated lying down in their hospital beds for the entire length of their stay. This imposed inactivity inevitably leads to loss of muscle mass and consequent weakness. This ICU acquired weakness affects all muscle groups, including those responsible for breathing. The weakness ranges from mild to severe, and is directly proportional to the severity of the original illness. Unfortunately, this acquired weakness can impede or prolong the healing process.

Situated in the Greater Toronto Area, William Osler Health System (WOHS) is a large, two site community hospital which offers care to patients with life threatening illnesses in its two intensive care units. It has been shown that the WOHS ICUs have higher patient lengths of stay compared to the provincial average (M.S. Miletin, personal communication, May 9, 2011). WOHS cares for a large number of individuals suffering from chronic diseases (for example, heart failure, emphysema, kidney disease, and diabetes) that increase the risk of immobility and its related complications during a stay in the ICU. Recently, the assisted mobilization of ICU patients beginning almost immediately after hospitalization (or *early mobility*) has been shown to decrease ICU acquired weakness and the hasten recovery from illness (Hopkins & Spuhler, 2009; Needham, Truong, & Fan, 2009; Schweickert et al., 2009). The leadership of the WOHS ICU is aware of this emerging standard of care and is interested in analyzing the current mobility practices in the unit, and is interested in solutions which will improve patient outcomes and decrease length of stay.

The paper will commence with a background section and will follow with a methodology and deliverables section. It will continue with a thorough literature review regarding early mobility in the ICU. The paper will then examine WOHS ICUs and ICUs of other hospitals and describe the results of these studies. It will conclude with a synthesis, discussion, then conclusion and recommendations.

BACKGROUND

Individuals who are in the intensive care unit are critically ill (reliant on various life supports, including intravenous medications and breathing machines) and are for the most part bedbound. These patients become deconditioned and develop muscle atrophy and nerve injury (Morris & Herridge, 2007). Improving the mobility of these individuals has been shown in multiple studies to improve health outcomes (Morris, 2007). Early implementation of mobility programs in intensive care units has also been shown to decrease hospital length of stay and decrease the risk of discharge to long term care facilities (Hopkins, Spuhler, & Thomsen, 2007).

METHODOLOGY AND DELIVERABLES

Methodology

The methodology used in this project consisted of four steps. The first step was to analyze William Osler Health System's organizational structure and ICU functions.

The second step included a literature review with a focus on current mobility practices in patients cared for in intensive care units.

The third step involved interviewing physiotherapists who work in ICUs in hospitals in Ontario which are similar in size to the ICU at WOHS and provide same types of services, including assisted breathing, known as mechanical ventilation. The hospitals were identified by the client and each physiotherapist was contacted by the researcher. After obtaining signed informed consent, a questionnaire (see Appendix 'A'), previously approved by The University of Victoria Ethics Board (see Appendix 'B'), was administered via telephone. Results from each hospital physiotherapist were then identified by number only (i.e. 1, 2, 3. . .) to protect confidentiality. The participants were informed of the limits to confidentiality and the means taken to protect them in the consent form (see Appendix 'C').

The fourth step was an analysis of the results from WOHS and the other hospitals.

Deliverables

Deliverables were discussed with the client and the following list was identified and agreed upon:

1. Literature review of current and best practice regarding early mobilization in the ICU.

2. Analysis of current mobility practices in the ICUs at WOHS. This analysis will use a qualitative approach and will include a strengths, weaknesses, opportunities, and threats (SWOT) analysis of the ICU.

3. Review of comparable hospitals and current practices in those hospitals.
4. Recommendation of guidelines and key measurable outcomes.
5. Strategic plan regarding the implementation of solutions.

Strengths of Methodology

There are two methodological strengths that should be mentioned. First, the literature review regarding early mobility and early mobilization in patients requiring intensive care was exhaustive. Second, the implemented questionnaire was done in a structured and standardized formal interview by the principal investigator.

Limitations of Methodology

One of the methodological limitations was the limited sample size of the questionnaire. The sample size was small due to the limited number of hospitals in Ontario with intensive care units of similar size and patient complexity as WOHS.

Another limitation was the definition of *early mobility* or *early mobilization*. It was apparent that participants had differing ideas as to what these terms meant. A standard definition was not provided to ensure that all therapists in the study were responding according to the same definition of early mobility or early mobilization.

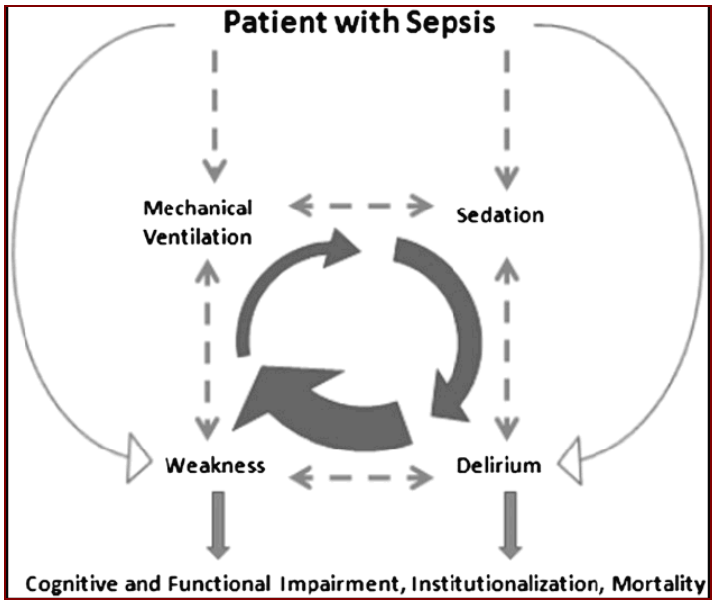
Limits to Confidentiality

Because of the small number of comparable ICUs in Ontario, the client (who is familiar with the comparable hospitals), may know or surmise who participated in the study. In addition, participants might be identified at their workplaces, if they required permission from their supervisors in order to participate in the study.

LITERATURE REVIEW

The literature of published studies describing early mobility practice in the intensive care is relatively new. As medical therapies evolve, patients who are critically ill increasingly survive from what were in the past uniformly fatal illnesses. However, the recovery process can take weeks to months. Inactivity in critically ill patients has shown to decrease muscle function, increase muscle atrophy, produce ICU acquired nerve damage, and deconditioning of the cardiovascular system (Morris, 2007). This ongoing cycle has been illustrated (see Figure 1) where patients with the very common ICU illness of severe infection known as sepsis are mechanically ventilated with a breathing machine and administered medications to induce and maintain a sedated state at the beginning of their life-threatening illness, but then become weak and delirious, which in turn causes them to stay mechanically ventilated and sedated longer (Vasilevskis et al., 2010).

Figure 1: Relationship between ICU acquired delirium and weakness in a patient with sepsis (Vasilevskis et. al (2010))



However, survivors of critical illness continue to experience functional disability long after leaving intensive care. Herridge et al. (2003) describe the functional disability in adults one year after discharge from the ICU. The study evaluated 109 survivors who had had acute respiratory distress syndrome, a form of severe lung injury usually due to infection or trauma. The results showed that at one year post discharge from the ICU, most of the patients had important functional limitations due to persistent muscle weakness.

A second study by Herridge et al. (2011) took a second look at the same cohort and analyzed function at five years post ICU stay, and reported similar results. This study concluded that due to ICU acquired weakness, patients may not fully recover and may have ongoing functional limitations after their ICU admission.

The first study by Herridge et al. (2003) prompted other researchers to examine the role of early mobility in the ICU and whether it would cause the long term functional outcome of patients who were critically ill to improve. Several studies report that a change in medical management during a patient's ICU stay along with early mobility resulted in decreased length of stay and improved outcomes (Kress, 2009). When patients receive early mobility from a physiotherapist and have a mobility protocol, there is a decrease in not only the length of stay in the ICU, but also a decrease in length of stay for the entire hospital admission (Morris, 2008). Schweickert et al. (2009) examined the

impact of early mobility with ICU patients combined with a decrease in the sedation of patients. This allowed the patients to interact with the therapists and participate more actively in the mobility program. This randomized control study examined 104 patients who were assigned to the control or intervention group. The intervention group was provided with early mobilization and exercise during times when their sedation was decreased. The results showed that patients in the intervention group returned to their premorbid functional level more often when compared to the control group. The authors concluded that early mobility in conjunction with a decrease in sedation was safe, improved functional outcome, decreased delirium, and decreased the number of days of mechanical ventilation.

In order to determine whether early mobility was feasible in ICUs, Pohlman et al. (2010) studied 49 patients who were seen 1.5 days post mechanical ventilation. Early mobility consisting of active/active assisted range of motion exercises, bed mobility exercises, dangling at the edge of bed, sitting balance exercises, transfer from bed to chair, standing exercises and ambulation training, was provided during periods when the patients' sedation was decreased. The study concluded that it was safe to incorporate both physiotherapy (PT) and occupational therapy (OT) immediately after a patient is mechanically ventilated, and having a decrease in sedation during those times were beneficial. Similarly, Bailey et al. (2007) conducted a study and concluded that early activity was possible during the early days of mechanical ventilation. In this case, the investigators carried out a prospective cohort study in which they studied 104 patients who were involved in early activity (sitting at edge of bed, transferring from bed to chair, and walking). Although the study showed that early activity is feasible in the ICU, it did indicate that a change in work culture and teamwork was required. There are a various definitions of organizational culture, in this paper, culture is defined as "...the beliefs and attitudes that are shared by an organization's members. Culture determines how a team embraces change and preserves it from generation to generation" (Bailey, Miller, & Clemmer, 2009, p.S430). The theme that changes in ICU practices must be made is also commented on by Thomsen, Snow, Rodriguez, and Hopkins, (2008). They state "The ICU environment may contribute [to] unnecessary immobilization [of patients]..."(p.1123).

In addition, researchers are examining early activities in ICU and how they affect functional recovery. A randomized controlled trial by Burton et al. (2009) studied the effects of using a bedside cycle ergometer in 99 patients. They concluded that the bedside ergometer was not only safe during the early stages of ICU but it also improved patients "...functional exercise capacity, muscle force, and perceived functional status at hospital discharge in ICU survivors" (p.2503).

Barriers and Contraindications

There are many items to consider prior to initiating early mobility in the ICU. Morris (2007) identifies potential barriers which may arise when implementing early mobility. These are as follows:

- Safety concerns – early mobility might be perceived to have adverse affects. Caregivers might feel that patient will medically deteriorate with early mobility.
- Multiciplicity of vascular access – it is common for patients in the ICU to have more than one vascular access device therefore care must be taken during mobilization.
- Sedation – currently ICU patients receive sedation and therefore cannot actively participate in early mobilization. New protocols are emerging which have daily awakening times within the general sedation protocols.
- Cost barriers – it is challenging to justify the costs associated with funding of physiotherapists, to initiate early mobility, when there is little data supporting the quality improvement of early mobilization.
- Obesity – more staffing will be required to address the mobility needs of obese individuals.
- Time restraints – the amount of time required to administer an early mobility program to ICU patients will increase the workload of the entire team involved.

Even when the barriers are identified and modified, there remain contraindications for initiating early mobility and for continuing early mobility. The list of contraindications, adapted from Pohlman et al. (2010), is illustrated in Table 1.

Culture Change

As briefly noted, the implementation of early mobility in the ICU does require a change in culture. The authors Thomsen et al. (2008) indicate that changes to ICU culture are required. The questions which arise are what are these changes and how can they be accomplished? A recent paper by Needham et al. (2010), illustrates the answers to these questions. For their quality improvement project, Needham and colleagues changed several routine items in their ICU. First they ensured that all patients were on “activity as tolerated orders” as opposed to bed rest orders. Second, they changed their sedation protocol. Then they established PT and OT guidelines and created a list of indications for physical medicine and rehabilitation. Needham and colleagues also addressed having sufficient PT, OT and rehabilitation staffing dedicated to the ICU. Finally, they ensured that patients were provided consultation services from both a physiatrist and neurologist. The authors showed that their interventions decreased length of stay in the ICU, decreased delirium rates, and improved functional mobility.

The medical management of the patients must change. For example, there should be a daily interruption of sedation, the culture of a more awake patient should be promoted,

Table 1: Contraindications for Initiating and Continuing Early Mobility (Pohlman et al., 2010)

Contraindications for Initiating Early Mobility	Contraindications for Continuing Early Mobility
A. Mean arterial pressure < 65	**A. Mean arterial pressure < 65**
B. Heart rate < 40, > 130 beats/min	**B. Heart rate < 40, > 130 beats/min**
C. Respiratory rate < 5, > 40 breaths/ min	**C. Respiratory rate < 5, > 40 breaths/ min**
D. Pulse oximetry < 88%	**D. Pulse oximetry < 88%**
E. Evidence of elevated intracranial pressure	**E. Marked ventilator dysynchrony**
F. Active gastrointestinal blood loss	**F. Patient distress**
G. Active myocardial ischemia	**a. Evidenced by nonverbal cues, gestures**
H. Actively undergoing a procedure	**b. Physically combative**
I. Patient agitation requiring increased sedative administration in the last 30 mins	**G. New arrhythmia**
	H. Concern for myocardial ischemia
	I. Concern for airway device integrity
J. Insecure airway (device)	**J. Fall to knees**
	K. Endotracheal tube removal

and early tracheostomy should be considered to facilitate mobility (Morris & Herridge, 2007). Researchers Vasilevskis et al. (2010) have extended these concepts and created a strategy called ABCDE. This targets key areas in order to promote early mobilization in critically ill patients. These areas are airway, breathing and circulation, delirium monitoring, and early mobility/exercise. They state “This strategy is interdisciplinary by design and most effective when implemented by nursing, respiratory therapy, and physical therapy personnel working together as an ICU team” (p. 1226).

Within the intensive care unit, the issue of culture change is quite complex. Bailey et al., (2009) list four areas to consider when implementing a culture change in ICUs. They are as follows:

1. Linking effective teamwork with patient focused outcomes – by having patient focused care, all healthcare providers in the ICUs will work together to achieve the goals thereby altering the change of current practices.

2. Creating a strategy to improve the level of teamwork and collaboration – this includes interdependence of all disciplines. For example, “early mobility requires coordination of care among the nurse, physical therapist, respiratory therapist, and critical care technicians” (p.S431). This will improve teamwork and overall patient care outcomes.

3. Creating a reliable process for early mobility – this includes a clear method on the delivery of early mobility and outcome measures.

4. Identifying current practice patterns which have the potential to interfere with mobility – this includes determining which areas of practice can be changed to facilitate mobility. For example, examining pain management process or the sedation protocols in the ICU. The use of medications can alter the level of alertness of a patient thereby preventing them from being able to participate in early mobility.

In addition to the above items, a clear vision must be presented by the ICU team to the stakeholders which promotes early mobility and must be supported by the hospital administration (Hopkins, Spuhler, & Thomsen, 2007). The list of stakeholders impacted can include, but is not limited to the following: physiotherapists, occupational therapists, speech language pathologist, respiratory therapists, social workers, nurses, pharmacists, physicians, patients, patients’ families, public advocacy groups, the Ontario Ministry of Health, and the hospital administration. This vision must also be communicated to the entire ICU staff and sufficient education should be provided to enable the changes. Due to the fact that there are a variety of different health care disciplines working in the ICU, collaboration is imperative when delivering early mobility (Hopkins & Spuhler, 2009). For example, there must be continued dialogue between the physician, nursing staff, physiotherapist, occupational therapist, and respiratory therapist to ensure that the goals of early mobility are shared and that there is a commitment to achieve these goals.

Future Steps

Early mobilization includes more than just turning the patient in bed, having them sit up, transfer to a chair and ambulation. It also encompasses passive range of motion, active range of motion exercises, neuromuscular electrical stimulation, and cycle ergometry (Needham, Troung, & Fan, 2009). Since ambulation of a critically ill patient is complex, there may be a need to create a technological aid to facilitate ambulation while mechanically ventilated. For example, a walker which has a safety seat, an equipment tower for cardiac monitor and other lines, and a portable ventilator would facilitate ambulation for a critically ill patient who requires mechanical ventilation (Needham et al., 2009).

The common element which rises from the literature review is that changes must be made in order to facilitate early mobility in the ICU. However, Thomsen et al. (2008) stated that more controlled studies regarding early mobility and sedation are needed. Other research questions have also risen with respect to mobilization in critical care. These are illustrated in Table 2.

Table 2: Future questions for ICU mobility therapy (Morris & Herridge, 2007)

Future Questions for ICU Mobility Therapy
• **Who is responsible for passive range of motion?** • **When to start ICU physical activity?** • **What is a safe change in heart rate and oxygen saturation?** • **What is a baseline heart rate?** • **How do we measure exercise load for ICU patients?** • **How do we judge appropriate doses of therapy and optimize the benefits of therapy?**

In addition, since early mobilization is relatively new, more discussion regarding safety parameters must be established in order to promote early mobility to critically ill patients. Morris and Herridge (2007) identify several of these factors, which are listed in Table 3.

Table 3: Safety parameters to be addressed in future mobility studies (Morris & Herridge, 2007)

Safety Parameters to be addressed in future mobility studies
• **Ventilator settings at which mobilization should be withheld?** • **Fever is known to increase oxygen consumption – should mobilization be [with] held in febrile patients?** • **Is there a dose of norepinephrine[1] that predicts harm if mobilization occurs?** • **How soon after respiratory failure or shock should mobilization be implemented?** • **How do we select the appropriate mode and intensity of mobilization?** • **What is appropriate action if a decrease in oxygenation or blood pressure occurs? Stop mobility therapy versus increase in supportive therapies for oxygenation?**

[1] Norepinephrine is a medication that is used to support a failing heart and higher doses are given to sicker patients.

Summary

The literature is in agreement that early mobility in the intensive care unit is beneficial to patients with respect to their outcomes. This not only includes improvement in patients' functional status but also the amount of time they are admitted to the ICU and overall hospital stay. It is also clear from the research that culture change is needed in order to successfully implement early mobility programs in the ICU. This includes changes in sedation of patients and a collaborative team work approach in mobilizing the patient. The teamwork is imperative in the success of early mobility. Key changes that need to take place include the promotion of the benefits of early mobility to staff members, and enabling all staff to participate and to engage in early mobility practices on a daily basis.

Further research is needed to determine sedation protocols and early mobility. In addition, long term studies regarding the effects of early mobility and functional status would be beneficial.

RESULTS

The following section describes the results obtained from the client interview regarding WOHS ICU structure and the questionnaire administered to physiotherapists from hospitals with similar size and patient population as WOHS ICUs. The findings will be analyzed in the discussion section.

William Osler Health Centre Intensive Care Structure

William Osler Heath Centre Intensive Care is situated in two campuses, the Etobicoke General Hospital (EGH) and the Brampton Civic Hospital (BCH). Combined, these hospitals have 550 inpatient beds, among which are 36 ICU beds (12 at EGH and 24 at BCH respectively). The administrative hospital structure is matrix model management. Matrix management is defined as having dual reporting relationships in an organization (Matrix Management Structure, n.d.) Both sites provide one to one nursing care (one nurse per patient) in the ICU for mechanically ventilated patients and one to two (one nurse for two patients) for non-mechanically ventilated patients.

The Ontario provincial median length of stay (LOS) for ICU patients is 2 days. However, both BCH and EGH ICUs have a median ICU length of stay of 3 days. The following (Table 4) describes both ICUs in more detail.

Strengths, Weaknesses, Opportunities, Threats (SWOT) Analysis

William Osler Health System's strengths, weaknesses, opportunities and threats (SWOT) (SWOT analysis, n.d.) must be identified In order to assist with goal setting and strategic planning. The following section is WOHS's SWOT analysis.

Table 4: Overview of William Osler Hospital System's Intensive Care Units

	Brampton Civic Hospital	Etobicoke General Hospital
Number of ICU Beds	24	12
Average ICU Bed Occupancy	92%	90%
Average Length of Stay in ICU	7 days	5.6 days
Median Length of Stay in ICU	3 days	3 days
Number of Physicians	12 Physicians, 2 work daily for 7 days. Rotation schedule.	5 Physicians, 1 per day for 7 days. Rotation schedule.
Number of Nurses	180	70
Number of Physiotherapists	1.0 Full Time Equivalent	0.5 Full Time Equivalent
Number of Occupational Therapists	0	0
Number of Speech Language Pathologists	0.2 Full Time Equivalent	0.2 Full Time Equivalent
Number of Pharmacists	1.0 Full Time Equivalent	0.5 Full Time Equivalent
Equipment	Hoyer lift in every room High wheeled walkers	Hoyer lift in 10 rooms High Wheeled Walkers
Weekend Coverage by Physiotherapy	None	None
Medical Directive for Physiotherapy to Assess and Treat	None	None

- Strengths
  - Matrix model management due to dual reporting relationships. This allows professional practice support as well as support in the clinical area setting. It promotes interprofessional collaboration which is important in supporting the team based care of the ICU.
  - Supportive administration
  - Patient centred care model

- Weaknesses
    - Two different sites, with each unique demands, issues, and culture
    - High turnover of nursing staff
    - Minimal to no weekend coverage by physiotherapy
    - Potential for resistance by employees (nursing) to change in workplace environment

- Opportunities
    - To provide current and up to date care to patients
    - Multidisciplinary approach to patient care delivery
    - Improve patient care outcomes by decreasing length of stay in ICU

- Threats
    - Budgetary restraints imposed by the Ministry of Health
    - Decrease in the number of health care professionals. Shortages of physicians, nurses, and other health staff.
    - Increase in patient volumes
    - Increase in proportion of elderly patients
    - Varying degrees of illnesses in the ICU

WOHS' strengths of having a supportive administration and a patient centred care model will enable it to establish the framework for the implementation of an early mobility program. Since early mobility in the ICU is relatively new, the organization has the opportunity to enhance their patient centred care model by providing current evidence based practice. The identification of weaknesses and threats will enable the WOHS team to be aware of potential challenges to the implementation and to the sustainability of the early mobility initiative.

Stakeholder Analysis

Since WOHS is a publicly funded hospital there are many different stakeholders that are involved. However, with respect to implementing early mobility in the intensive care unit, the stakeholders can be identified as follows: physiotherapists, occupational therapists, speech language pathologist, respiratory therapists, social workers, nurses, pharmacists, physicians, patients, patients' families, public advocacy groups, the Ontario Ministry of Health, and the hospital administration.

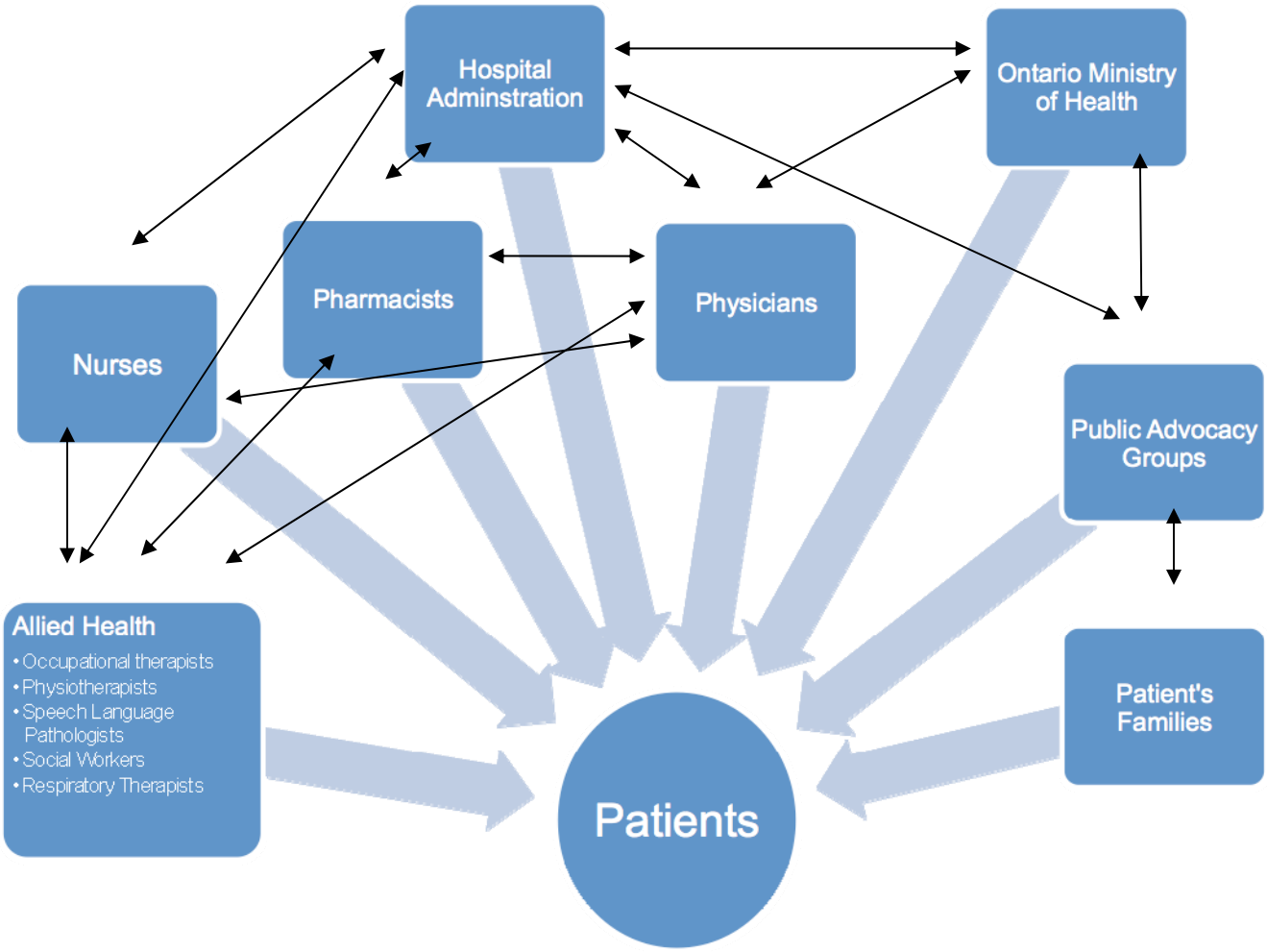
The relationship of the stakeholders is complex and is depicted in the stakeholder map (see Figure 2). The following is a description of the stakeholders listed:

- Physiotherapists – are regulated by the Ontario College of Physiotherapy and hold an independent practice certificate. They are front line staff who provide care in the ICU by

assessing patients and providing cardiorespiratory and mobility treatment. They are employed by the hospital and have close working relationships with nursing, pharmacy, and physicians.

- Occupational Therapists – are regulated by the Ontario College of Occupational Therapy and hold an independent practice certificate. They are front line staff who provide care in the ICU by assessing patients for wheelchair seating and upper extremity splinting, and providing treatment for mobility and activities of daily living. They are also involved with cognitive assessment and treatment. They are employed by the hospital and have close working relationships with nursing, pharmacy, and physicians.

Figure 2: William Osler Health System Stakeholder Map



- Speech Language Pathologists - are regulated professional and hold an independent practice certificate. They have direct interactions with patients and their practice area includes assessment of communication, cognition, and swallowing. They are employed by the hospital and have close working relationships with nursing, pharmacy, and physicians.

- Respiratory Therapists - are a regulated professional and hold an independent practice certificate. They have direct interactions with patients and their practice area includes supportive care for patients who require mechanical ventilation and/or oxygen therapies. They are employed by the hospital and have close working relationships with nursing, pharmacy, and physicians.

- Social Workers - are regulated by their college and hold an independent practice certificate. They are front line staff who are involved with providing support to patients and families during their stay in the ICU. They are employed by the hospital and have close working relationships with nursing, pharmacy, and physicians.

- Nurses – are unionized employees of the hospital. They are front line staff who provide daily care to patients which includes the administration of prescribed medications, maintenance of intravenous lines and catheters, and mobility. They have close working relationships with physiotherapists, occupational therapists, speech language pathologists, social workers, respiratory therapists, pharmacists, and physicians.

- Pharmacists – are regulated by their college and hold an independent practice certificate. They have direct interactions with patients and their interest includes regulation of medications and education of staff regarding administration of medications and contraindications of medications. They are employed by the hospital and have close working relationships with physiotherapists, occupational therapists, speech language pathologists, social workers, respiratory therapists, nursing, and physicians.

- Physicians – are independent practitioners who have privileges to practice at WOHS. They have direct interactions with patients and provide medical care to patients based on current best practices. They are paid on a fee-for-service basis by the Ontario Ministry of Health and re involved with all the other health care team in order to provide patient care.

- Patients – these are individuals who are medically ill and unstable. They are the most vulnerable of all stakeholders as they sometimes are unable to voice their concerns. They rely on the other stakeholders in order to have their best interests heard. These may include decreasing wait times, accessibility to care, and best practice medicine.

- Patients' families – are individuals whose interest are in their family members care delivery and outcomes. This may include wait times, availability of tests and investigations, and daily care provided.

- Public advocacy groups – includes groups from the public who wish to change the way public health care is delivered and administrated. They do not have direct patient contact at the hospital.

- Ontario Ministry of Health – provides funding to WOHS and interest includes budgetary balance and fiscal responsibility. The Ministry is also interested in decreasing wait

times and is accountable to the public, however they do not have direct involvement or any interactions with daily patient care.

- Hospital administration – their role is to determine how funds, which are allocated by the Ontario Ministry of Health, are spent. Their interests are to balance annual budgets, improve patient flow, improve patient care and satisfaction, and improve staff satisfaction. They have limited interactions with patients and do not provide any daily care.

Review of Other Hospital ICUs

All hospitals in Ontario are publicly funded and have the same challenges with respect to being fiscally responsible and transparent. Hospitals do differ in size and in the patient population that they serve. They also differ in the kinds of care that they provide. For example, only certain hospitals and respective ICUs may provide care to patients suffering from traumatic injuries, burns, or patients requiring complex surgical procedures. Therefore, in order to compare ICUs appropriately, it is vital to analyze hospitals which are the same size and provide the same types of service, such as mechanical ventilation. The following chart (see Table 5) is a summary of the ICUs at different hospitals and early mobility practices. The first column is the information that is obtained from WOHS and is inserted in the chart for comparison purposes.

Table 5: Results from other Intensive Care Units

	WOHS	Hospital #1	Hospital #2	Hospital #3	Hospital #4	Hospital #5	Hospital #6
Number of ICU Beds	36	24	20	16	16	20	30
% Occupancy	91%	87.5 %	100 %	90 %	100 %	80 %	95%
Number of Physiotherapists	1.5 FTE	1.5 FTE	2.0 FTE	1.0 FTE	1.0 FTE	1.0 FTE	1.45 FTE
Number of Physiotherapy Assistants or Rehab Aids	None	Help available	None	None	None	None	None
Hours of PT coverage	Monday thru Friday 7.5 hours	Monday thru Friday 7.5 hours. On call coverage Saturday and Sunday	Monday thru Friday 9 hours. Chest PT and on call coverage Saturday and Sunday	Monday thru Friday 7.5 hours. Chest PT on Saturday and Sunday only.	Monday thru Friday 8 hours. On call coverage Saturday and Sunday	Monday thru Friday 8 hours. Chest PT on Saturday and Sunday only.	Monday thru Friday 8 hours. Weekend 1 – 3 hours.

	WOHS	Hospital #1	Hospital #2	Hospital #3	Hospital #4	Hospital #5	Hospital #6
% patients seen daily	n/a	50%	70-75%	100 %	75-80%	50 – 60 %	100 %
% seen daily for mobility	n/a	20%	75%	35%	Not answered	25 %	100 %
% seen daily for chest	n/a	80%	25%	65%	Not answered	75 %	40 %
Equipment	-Hoyer lift	- Low Wheeled	- Low Wheeled	- Hoyer lift	- Mechanical	- Walkers	- High

	- High Wheeled Walkers	Walker - High Wheeled Walker - Tilt Table - Stretcher Chair - Standing Sling - Canes - Bike for Lower Extremities	Walker - Treadmill - Wii - Standing Sling - Bike for Lower Extremities - Physiotherapy Ball - Weights	- Standing Sling	percussion machine - Cough assist - Incentive Spirometry - Hoyer lift - Tilt recline chairs - Bike for lower extremities - Walker - Rollator with oxygen tank		wheeled walker - Hoyer lift
Provide Early Mobility	Yes	Yes	Yes	Yes	Yes	Yes	Yes
% Patients who receive early mobility	n/a	100 %	70-75%	100% if stable	80%	50%	n/a
Early Mobility Practices	- Mobilize bed to chair - Dangle - Sit to Stand	- Mobilize bed to chair - Dangle - Sit to Stand - Ambulation - Stairs	- Dangle - Transfer to chair - Ambulation - Stairs	- Dangle - Transfer to chair - Standing - Pre-gait exercise such as marching on the spot	- Range of Motion (passive and active)	- Range of motion - Dangle - Stretcher chair	- Bed mobility - Strengthening exercises - Dangle - Transfer bed to chair
Early Mobility of Patients who are mechanically ventilated	Yes. However no ambulation.	Yes	Yes	Yes. However, no ambulation secondary to limited staffing	Yes	Yes. However no ambulation. Only transfer to chair.	Yes. However no ambulation. Only transfer to chair.
Contraindications for Starting Early Mobility	n/a	- Unstable C-spine - More than one blood pressure support medication - Active seizures - Active GI Bleed	None noted	- Heart Rate - Blood pressure - Cardiac arrest	- Temporary pacemaker - Hemodialysis - Femoral arterial line	None noted	- Femoral dialysis catheter
Contraindications for Continuing Early Mobility	n/a	As above	None noted	As above	As above	None noted	As above
Medical Directives for PT to Assess and Treat	No	In Progress	In Progress	Premade ICU standing order (PT to see)	No	No	No

It is evident from the above chart that WOHS and the other hospitals have a high occupancy rate (80% and above). They also all have dedicated funds which are allocated to ICU physiotherapists. Although all hospitals provide early mobility, the definition varied from facility to facility. There also are differences in the equipment resources that are available in the ICUs for treatment and promotion of early mobility.

Interestingly, only 2 of the 7 hospitals have a medical directive process. A medical directive would allow physiotherapists to identify and treat patients who would benefit from early mobility, without the delays inherent in having to wait for a physician's order. The information in the table will be discussed in more detail in the results section.

CONCEPTUAL FRAMEWORK

The following is an illustration of the conceptual framework of early mobility in the intensive care unit (see Figure 3). It was established by combining the information gathered in the literature review with current practices in the intensive care units that were studied. The ICU patient is in the middle of the framework with all the elements which impact it. It depicts what currently happens as well as how changes can be made thereby improving patient health care.

Description of Conceptual Framework

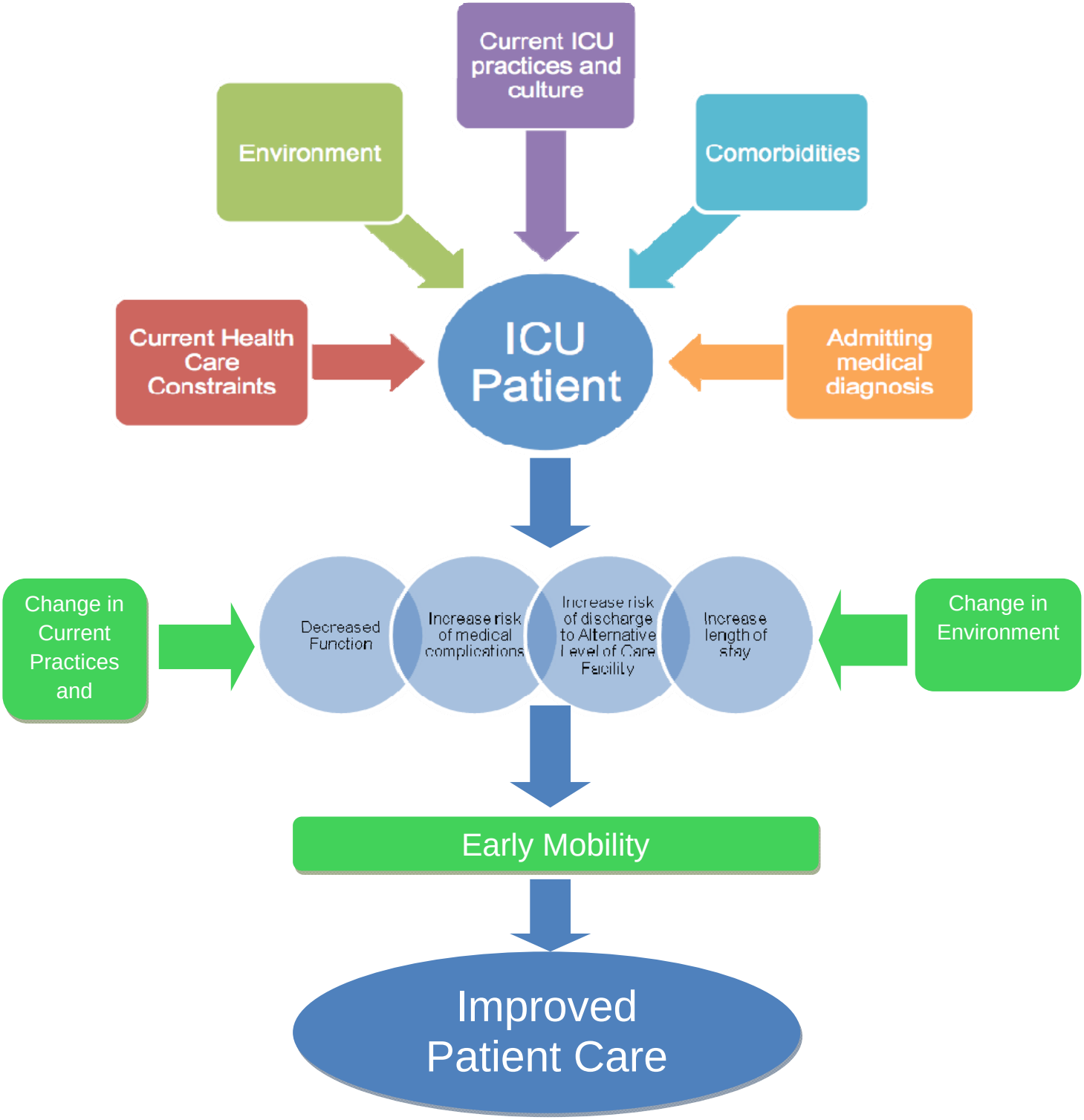
Once admitted to the ICU, patients are faced with many factors. The above conceptual framework illustrates these factors. The ICU patient faces the following variables: current health care constraints, environment, current ICU health care practices and culture, admitting diagnosis, and co-morbidities. The following explains the variables in more detail.

a) Current health care constraints – these include annual requirements in order to balance the hospital budget and be fiscally responsible and transparent to publically funded resources. The provincial government and therefore the provincially funded hospitals are under constant pressure to reduce or maintain health care funding while the care requirements and costs increase. These increases are in part due to the increase in the elderly population and increase in longevity as well as new medical advances.

b) Environment – the ICU environment is an important one. These patients are often critically ill requiring one to one nursing care. That means that they should have one nurse dedicated to their care. The medical equipment, such as heart monitors, ventilators, electrical beds, should all be up to date.

c) Current ICU health care practices and culture – presently, the focus of the patients stay is medical management. Early mobility is discouraged; on the contrary, patients are actually encouraged to remain in bed during their ICU stay.

Figure 3: Conceptual Framework


Current ICU practices and culture
Environment
Comorbidities
Current Health Care Constraints
ICU Patient
Admitting medical diagnosis
Change in Current Practices and
Decreased Function
Increase risk of medical complications
Increase risk of discharge to Alternative Level of Care Facility
Increase length of stay
Change in Environment
Early Mobility
Improved Patient Care

d) Admitting diagnosis – the diagnosis with which a patient is admitted to the ICU varies tremendously. At times, the condition is irreversible with death being imminent. Other times, patients require life saving strategies combined with medial care in order to improve and be discharged out of the ICU.

e) Co-morbidities – often patients admitted have multiple medical issues which impact their current medical diagnosis. The co-morbidities also affect how the patient will be medically managed in the ICU as well as potential prognosis.

When a patient faces the above factors they can progress to develop the following:
a) Decreased function
b) Increased risk of medical complications
c) Increased risk of discharge to medical care facility
d) Increased length of hospital stay

The literature review as summarized above states that changes are often needed to implement early mobility. These include changes in current practice and work environment and culture. The conceptual framework illustrates how these changes will allow an early mobility program to will improve patient outcomes.

DISCUSSION

William Osler Health System

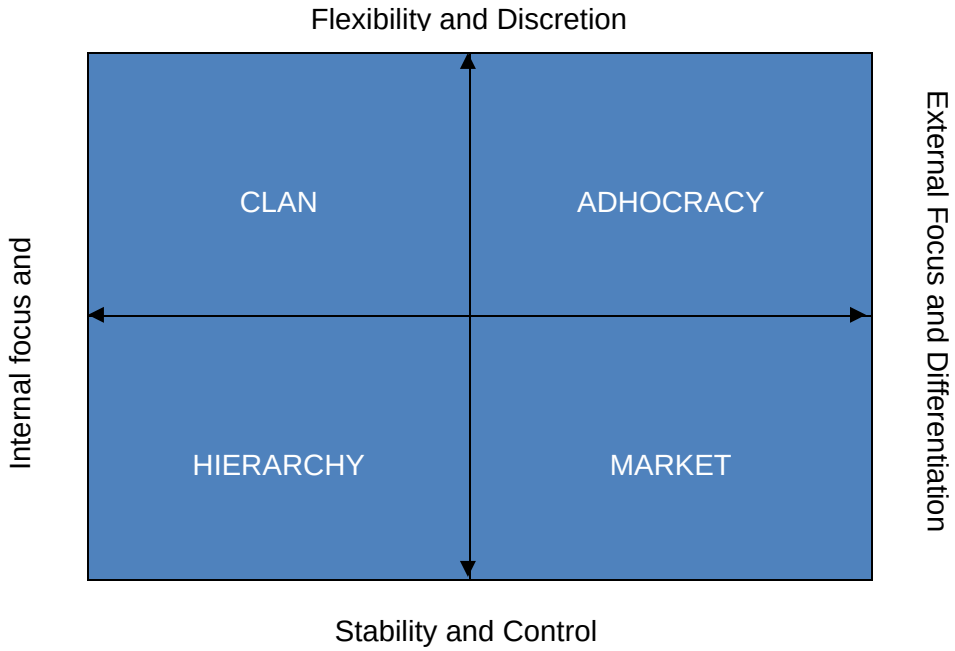
As mentioned above, WOHS incorporates a matrix model for its management structure. Quinn, Faerman, Thompson, McGrath, and St. Clair, (2007) define a matrix model as the one in which employees are assigned to functional departments and also cross functional teams. There are three items which should be present for a matrix model to be successful. These are "...outside pressure for dual focus, pressures for high information-processing capacity, and pressures for shared resources" (Westphal, 2005, p.416). This method of management is successful in an acute care hospital due to the fact that health care disciplines often have a professional department as well as the area where they practice and work clinically. For example, a physiotherapist who works in the ICU reports directly to the physiotherapy department however is also accountable to the ICU manager for the services that they provide to ICU patients.

The SWOT analysis (SWOT Analysis, n.d.) illustrates the strengths, weaknesses, opportunities and challenges that WOHS faces when planning a change in its ICU. In addition to a SWOT analysis it may be beneficial to determine what the organizational culture is using the Competing Values Framework (CVF) and/or the Organizational Culture Profile (OCP). The literature review in this paper indicated that a culture change in the intensive care unit should take place in order to successfully implement an early mobility program(Hopkins et al., 2007; Thomsen et al., 2008). This includes changes in

how patients are sedated and a collaborative team work approach to mobilizing the patient. Cameron and Quinn (2006) state "...failure to change the organization's culture doomed the other kinds of organizational changes that were initiated" (p.1). Determining WOHS organizational culture will allow the ICU team to reflect on how they currently operate and where they would like to be in the future with respect to early mobility program. Once this is accomplished, the team can determine the exact steps required in order to successfully accomplish the goal of early mobility in the ICU.

The CVF framework is comprised of four different quadrants which not only determine an organization's culture, but also its ability to change (Cameron and Quinn, 2006). It is divided into four sections: flexibility and discretion, stability and control, internal focus and integration, and external focus and differentiation. As illustrated in Figure 4, the CVF has four core culture types: clan, adhocracy, hierarchy, and market (Cameron and Quinn, 2006).

Figure 4: Competing Values Framework (Cameron and Quinn, 2006)



The following is a detailed description of the four core culture types as defined by Cameron and Quinn, 2006.

- Clan: family type organization with shared values and goals between employees and organizational leadership.
- Adhocracy: focus is on adaptability, flexibility, and creativity.

- Hierarchy: has a clear line of decision making authority, standardized rules and procedures.
- Market: focus is on external environment and competitiveness in the market place. Goal is to increase productivity, results and profits.

The identification of WOHS dominant culture style will allow it to have a better understanding as to how the leadership operates and its effectiveness. Once this is established then a preferred culture style is determined. Cameron and Quinn (2006) list six items that are imperative in assisting culture change. For WOHS, it would mean a change in the ICU to initiate and sustain an early mobility program. These six items are "..reach consensus on current culture; reach consensus on the desired future culture; determine what the changes will and will not mean; identify illustrative stories; develop a strategic plan; develop an implementation plan" (p.90).

This would assist with the planning of how to implement change in the organization with respect to early mobilization in the ICU as well as team building. Since the early mobility program requires collaboration of several health care professionals it may be beneficial to have a team building retreat. The competing values of leadership, effectiveness and organizational theory is depicted in Appendix 'D'.

The OCP, on the other hand, can determine the organizational culture as perceived by the employees, as well as the person-organization fit (O'Reilly, Chatman, & Caldwell, 1991). This second point may be beneficial as change in work environment and practices will require the ICU team to change how they currently operate. The OCP will be discussed in more detail in the recommendations section.

Stakeholder Analysis

Stakeholder analysis is an important step when strategically planning regarding change in how care is provided in the intensive care units at WOHS. Bryson (2004) states "Wise use of stakeholder analyses can help planners frame issues that are solvable in ways that are technically and administratively feasible and politically acceptable...and that create public value and advance the common good" (p. 335). In the results section it is evident that the number of stakeholders are extensive. It is interesting to note that not all of the stakeholders have the same interests or power to initiate change. Collaboration among stakeholders will enable successful implementation of early mobility in the ICU.

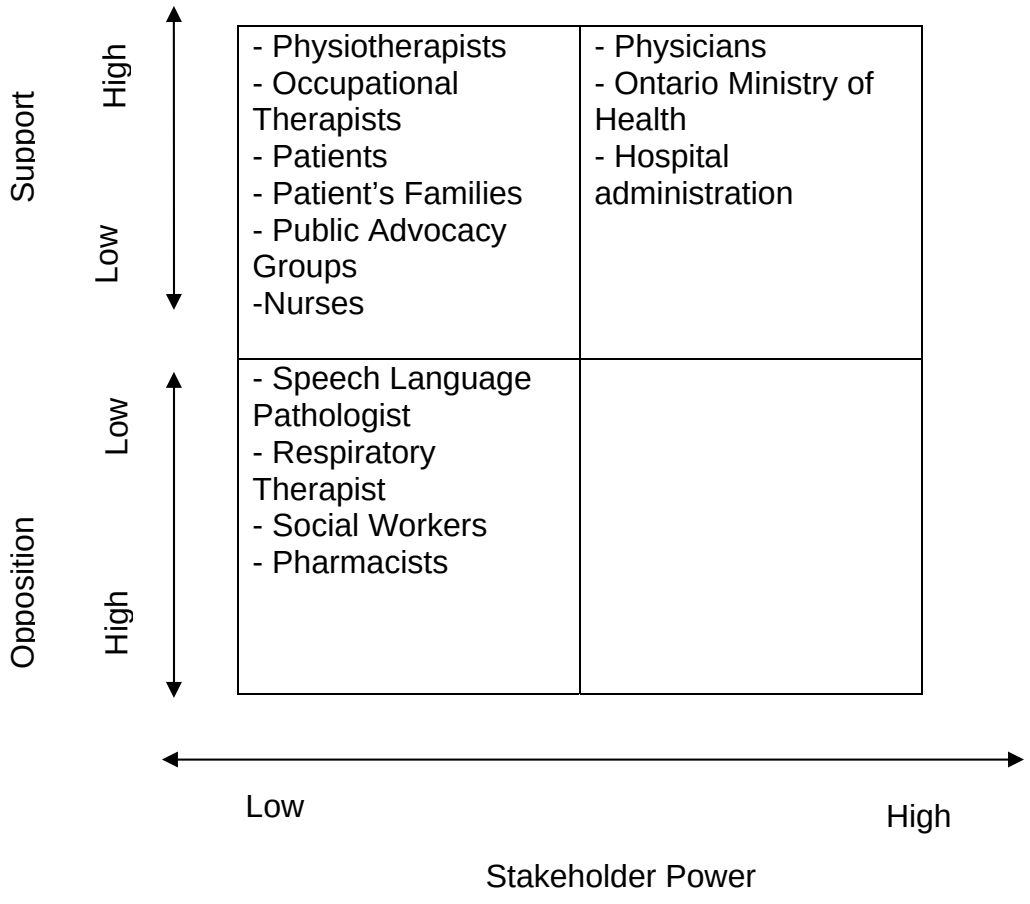
The following illustrates how the different stakeholders vary in interest and power (see Figure 5). It is interesting to note that there are many groups who support the initiative of early mobility in the ICU; however they almost all hold very little stakeholder power. The important point is that three groups, the physicians, the Ontario Ministry of Health, and the hospital administration, all have strong support and strong stakeholder power.

Current Early Mobility Practices in Other Intensive Care Units

The hospitals which were approached had ICUs which were similar in size to that of WOHS's ICUs and provided the same types of service such as mechanical ventilation. It is apparent from the results of the interviews that some common themes among the ICUs emerged. However, more differences among the ICUs were identified than similarities.

The common themes that emerged are that all hospitals have a high ICU occupancy rate (80% and above). They all have dedicated funds which are allocated to ICU physiotherapists. And all of the physiotherapists interviewed stated that early mobility was part of their practice.

Figure 5: Problem Frame Stakeholder Map (adapted from Bryson, 2004)



There were also several differences noted among the different hospitals. First, only one hospital has services that are provided by a physiotherapist assistant or rehabilitation

aide. Second, the definition of early mobility varied from bed mobility and bed exercises to ambulation. This is important as common language regarding the definition of early mobility is necessary in order to compare facilities as well as to engage in further research as to the benefits and contraindications. Similarly, the contraindications of initiating early mobility and continuing early mobility were different among the hospitals. The last two points make it difficult to compare hospitals for research.

Another difference was that only three of the six physiotherapists provided ambulation to patients who were mechanically ventilated. Of the three that did not, reasons included lack of resources and staff. The differences in resources are partly noted in the equipment section. The type and amount of equipment such as standing slings, high wheeled walkers, and bike for lower extremities varied across all six organizations.

The most surprising difference was that only 2 of the 6 hospitals had a medical directive process. A medical directive would allow physiotherapists to identify patients who would benefit from early mobility on their own and would not rely on a physician's order.

Comparing Early Mobility Practices at WOHS with Other Intensive Care Units

When comparing early mobility practices at WOHS ICUs with other ICUs which are similar in size and patient mix, it is evident that the allocation of physiotherapy staff is consistent with the other hospitals. The coverage of physiotherapy is approximately the same as other sites with coverage being from 8 hours during the week. However, WOHS is the only hospital that does not have any weekend coverage. This indicates that patients are not seen on the weekend for either cardiorespiratory treatments or early mobility. WOHS also does not have a medical directive for physiotherapy to assess and treat patients in the ICU.

The equipment that is provided in WOHS ICUs is on the low end of the spectrum. It only has a Hoyer lift and high wheeled walkers. In order to improve and incorporate early mobility of patients more equipment would be beneficial. This would include, but not be limited to, standing sling, Wii (to promote functional recovery), bike for lower extremities, and tilt table.

Therefore in order to successfully implement an early mobility program, WOHS will need to implement specific changes. These include a creation of an early mobility protocol; review of current staffing; and audit of current equipment. These will be discussed in more detail in the recommendation section of the paper.

Evidence Base

In order to establish an effective early mobility program in the ICU there needs to be a link to current research. For example, the definition of early mobility needs to be

identified as in the literature. It is defined as bed mobility, dangling at the edge of bed, transferring from bed to chair, passive range of motion, ambulation, active range of motion exercises, neuromuscular electrical stimulation and cycle ergometry (Needham et al., 2009). This is administered with the applied knowledge of the contraindications for both commencing and continuing early mobility (see Table 1). It is also important to note that patients who are mechanically ventilated can and should participate in all aspects of early mobility, not just the tasks that are accomplished in bed.

In addition, the literature is consistent in indicating that sedative medications must be decreased in order for patients to actively participate in their mobility programme. Once the patient becomes awake enough to participate with early mobility, the entire health care team is involved. The ICU health care team is comprised of, but not limited to, the physicians, nursing, pharmacy, respiratory therapist, physiotherapist, occupational therapist, speech language pathologist, social work and dietician. These individuals need to work as a collaborative team in order to facilitate early mobility. Therefore, as the literature indicates a culture change is required to enable this new model of care.

Strategic Issues

By taking the above discussion points into account the following strategic issues can be identified for WOHS ICUs.

1- Improving Patient Care
   - Description: Currently patients who are admitted to the ICU at WOHS do not receive early mobility. They are seen as per physician order for cardiorespiratory treatment, bed exercises and transfer from bed to chair.
   - Success definition: All patients who meet the inclusion criteria for early mobility are seen daily. This includes patients who are mechanically ventilated.
   - Barriers to success: This includes staffing, culture change regarding decreasing sedation, budgetary restrictions, and lack of equipment.
   - Enablers: This includes Ministry of Health and hospital administration.
   - Strategic Question: Could implementing early mobility practices in the ICU improve patient care and satisfaction?

2- Decreasing length of stay
   - Description: Currently WOHS ICU median length of stay is 3 days, which is above the Ontario provincial median of 2 days.
   - Success definition: Decrease length of stay to be same or less than the provincial median.

- Barriers to success: This includes lack of funding, insufficient staffing, culture change regarding early mobility, and lack of equipment.
- Enablers: Includes Ministry of Health and hospital administration.
- Strategic Question: Could implementing early mobility practices in the ICU decrease the median length of stay?

3- Improve patient's functional status

- Description: Currently, patients at WOHS ICU are seen for cardiorespiratory treatment, bed exercises and/or transfer to a chair. As the literature indicates many ICU patients are not at their previous level of functioning when discharged from hospital and some do not reach their baseline even after two years post admission.
- Success definition: Patients will improve in their level of functioning to be close to baseline and there will be less discharge to long term care facilities. Patients will be more likely to be discharged back to their home if their level of functioning is that of their preadmission baseline.
- Barriers to success: This includes budgetary restraints, insufficient staffing, and lack of equipment.
- Enablers: Includes Ministry of Health and hospital administration.
- Strategic Question: Could implementing early mobility practices in the ICU improve patient's functional status on discharge?

Goals

From the above strategic issues, it is apparent that there are two main goals. These are improving patient care and decreasing the length of stay in the intensive care unit. The goals grid below (see Table 6) describes the items that WOHS should achieve, preserve, avoid, and eliminate.

Sustainability

The early mobility program will be a new initiative at WOHS. In order to launch it, new resources will have to be made available by the hospital (to increase staffing and purchase equipment). It will be important to demonstrate the impact of the program to the hospital administration by measuring patient outcomes. If the program is successful in improving patient outcomes, it will be able to justify future resource requirements. The objective measures and long term sustainability will be discussed further in the recommendations section.

Table 6: Goals Grid (adapted from Nickols and Ledgerwood, 2006)

ACHIEVE	PRESERVE
• **Improve patient care** • **Decrease length of stay** • **Improve patient's functional outcome** • **Implement a model of care that reflects best practice** • **Implement medical directive for physiotherapist to assess and treat patients for early mobility** • **Culture change of the ICU staff with respect to early mobility**	• **Staff satisfaction and retention** • **Opportunities for staff education and clinical growth** • **Teamwork structure** • **Good communication with hospital administration**
AVOID	**ELIMINATE**
• **Staff attrition** • **Increase in costs**	• **Current sedation practice** • **Current mobility practices** • **Negative feelings of changes to work routine**

RECOMMENDATIONS

The following section will discuss recommendations for WOHS to consider for successful implementation of early mobility practices in their intensive care units.

1 - Organization Culture Assessment

The literature indicates that culture change is needed in ICUs in order to facilitate early mobility practices. This includes changes in how patients are sedated as well as having therapy involved for early mobility commencing during the patient's second day of admission. There are two culture assessments that may be of benefit for WOHS to explore in order to establish its current culture.

The Organization Culture Assessment Instrument (OCAI) (see Appendix 'E') is a tool which allows WOHS to determine its culture. Once this internal analysis is complete, WOHS will have identified its leadership style, theory of effectiveness, and value drivers. The OCAI is composed of a questionnaire targeting six different sections. These sections evaluate the organization's dominant characteristics, organizational leadership, its management of employees, organizational glue, strategic emphasis, and criteria of success (Cameron and Quinn, 2006).

An average score is determined for each area and then mapped on a graph (see Appendix 'F'). This can be done to assess WOHS's current culture and/or its preferred cultures.

The second tool which would assist WOHS in determining its culture is the Organizational Culture Profile (OCP) (see Appendix 'G'). The tool has 54 items which are placed into rows of 9 categories by the participants with one end of the row being the most characteristic component and the other end the least characteristic component.(O'Reilly et al., 1991). The OCP can also determine the participant's individual preference and then calculate the person-organization fit.

Once WOHS has determined which culture type dominates its organization it can then begin to plan how to incorporate this change. The OCAI or OCP along with a SWOT analysis will be beneficial when implementing and strategizing about changes required to be made. These changes include when and how physiotherapy is referred in the ICU, how a patient is sedated in the ICU, who is involved in delivery of early mobility, and team work.

2 – Enhancement of early mobility in the intensive care units

There are three items that should be considered in order to further develop a successful early mobility program in the ICU at WOHS. First is the creation of a protocol for early mobility with inclusion and exclusion criteria. The protocol should also include a medical directive delegating physiotherapists to actively assess and determine if patient meets criteria for early mobility.

Second is a review of current staffing. There needs to be sufficient physiotherapy staff dedicated to the ICU both during the week as well as on weekends and holidays. Furthermore, there needs to be sufficient nursing staff and Allied Health staff allocated to the ICU in order to engage the early mobility program. For example, a patient who is mechanically ventilated should be able to ambulate with the assistance of a physiotherapist, physiotherapy assistant, nursing and respiratory therapist on a Saturday. The patient should not have to wait until a week day to be mobilized. This will improve patient care and result in improvement of the patient's health status. Therefore, the recommendation is for seven day coverage in the ICU[2]. For WOHS ICU, Brampton site, the recommendation is for an additional 1.0 full time equivalent (FTE) physiotherapist, 0.5 FTE physiotherapy assistant, and 0.5 FTE occupational therapist. For WOHS ICU, Etobicoke Site, the recommendation is for an additional 0.5 FTE physiotherapist, 0.5 FTE physiotherapy assistant, and 0.5 FTE occupational therapist.

Finally, an audit of the available equipment is recommended. In order to engage patients in an early mobility program there needs to be sufficient resources with respect to staffing but as well as equipment. Currently, the equipment available to facilitate early mobility at WOHS includes Hoyer lifts and high wheeled walkers. It is recommended to increase the equipment to allow for a wider range of activities.

[2] Weekend coverage does not have to be full day.

Equipment which would enhance a patient's mobility includes, but is not limited to standing slings, low wheeled walkers with oxygen tank holder, and bikes for lower extremities. The use of a Wii might also be beneficial as it will engage the patient in early mobility and a functional activity. For example, playing a game of bowling would encourage mobility as well as a serving as functional pastime activity.

3 – Team Building

Since the early mobility program requires collaboration of several health care professionals it may be beneficial to have a team building retreat. This will allow a general education of the importance of early mobility and how it is related to best care practice. It will also enable each discipline to educate the others regarding their scope of practice and their role during the early mobilization of the patient. Other benefits of a team building retreat will be to determine how the program will be initiated and allow of feedback (both positive and critical) from front line staff regarding the feasibility of the program.

4 – Outcome Measures

In order to illustrate to WOHS administration that the early mobility program is successful, it is imperative that outcome measures are determined and collected both prior to and after the early mobility program is initiated. There are four outcome measures that should be collected. These are:

1. Length of stay in the ICU
2. Length of stay in the hospital
3. Rates of readmission to the ICU
4. Discharge destination

The above outcome measures would allow objective analysis as to whether early mobilization of patients in the WOHS ICU is beneficial or not. It would also relate to the goals that were identified in the discussion section.

5 – Long term sustainability

Given the fact that there are many new resources being implemented in order to activate the early mobility program at WOHS, the long term sustainability of the program is important. Care must be taken to identify whether early mobility has a positive effect on patient care. Analysis of the data collected with the objective measures will hopefully demonstrate a return on investment to the hospital administration.

Education of staff should be repeated at regular intervals, such as biannually. Also, a local champion should be identified early on to serve as a leader in the early mobility implementation. The champion should be involved with the education of staff and mentor staff daily.

Summary

The above recommendations identify strategies that WOHS can implement immediately as well as long term. The creation of a good foundation for the implementation of early mobility will assist with its success.

CONCLUSION

In conclusion, early mobility in the intensive care units is feasible and has shown to have a positive outcome with respect to decreasing patient length of stay in hospital as well as patients' functional outcomes.

The purpose of this project was to review current literature and examine WOHS organizational structure. The project also included a comparison of WOHS ICU with other hospital ICUs. The analysis and recommendations made were based on data collected as well as best practice guidelines which were reported in the current literature.

By implementing early mobility in the ICU, WOHS can be a leader in changing the current culture of patient care and act as an ambassador to other Ontario community hospitals.

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Appendix ‘B’ – Interview Questions for Intensive Care Unit (ICU) Physiotherapist (PT)

1. How many ICU beds does your hospital have?
2. What is the usual occupancy?
3. How many different Physiotherapists work in the ICU? How many full time equivalents?
4. Is there 24/7 coverage? If not, what hours/days are covered?
5. How many Physiotherapy Assistants or Rehab Aids work in the ICU?
6. On average what % of patients are seen daily by physiotherapy?
7. From the above number of patients seen, on average how many referrals are for chest physiotherapy and how many are for mobility?
8. What equipment is available for you to use when you treat patients in the ICU?
9. Do you provide any early mobility in the ICU? By early mobility I mean starting by the second day of ICU admission, if no contraindications are present.
10. What % of patients receive early mobility?
11. What are your early mobility practices?
12. Do you (or other ICU PTs in your unit) provide mobility treatments to patients on ventilators?
13. What are the contraindications for starting early mobility?
14. What are the contraindications for continuing early mobility?
15. Does your facility have any medical directives for PT to assess and treat patients in the ICU?
16. Do you have any other comments, or is there anything that you would like to tell me about your unit’s practices, about which I didn’t specifically ask?

Appendix 'C' - Participant Consent Form

Participant Consent Form

Analysis of Mobility Practices in the Intensive Care Units at William Osler Health System

You are invited to participate in a study entitled Analysis of Mobility Practices in the Intensive Care Units at William Osler Health System, that is being conducted by Nathalie Topdjian.

Nathalie Topdjian is a Graduate student in the department of Public Administration at the University of Victoria and you may contact her if you have further questions by e-mail at topdjian@uvic.ca.

As a Graduate student, I am required to conduct research as part of the requirements for a degree in Master's of Public Administration. It is being conducted under the supervision of Dr. Rebecca Warburton. You may contact my supervisor at rnwarbur@uvic.ca or 250-885-8469.

Purpose and Objectives

The purpose of this research project is to analyze current mobility practices in the intensive care units (ICUs) at William Osler Health System (WOHS) and recommend solutions which will improve patient outcomes and decrease length of stay.

Importance of this Research

Research of this type is important because WOHS ICUs have higher patient lengths of stay compared to the provincial average. WOHS cares for a large number of individuals suffering from chronic diseases (for example, heart failure, kidney disease, diabetes) that increase the risk of immobility and complications during a stay in the ICU. Historically, the ICU environment and work culture have not been supportive of early mobilization. Patients are usually treated in their hospital beds and activity is not encouraged. Due to the fact that early mobilization has shown to decrease length of stay and improve patient outcomes, WOHS is interested in analyzing its current mobility practice, and identifying current practices and changes that could improve patient outcomes and decrease length of stay. Ontario hospital ICUs differ not only in size but, also services that they provide. Therefore when analyzing current practices at other hospitals it is important to identify those which can be compared to WOHS's ICU in size and service. More specifically, the ICUs must provide mechanical ventilation. Furthermore, it is interested in solutions which will improve patient outcomes and decrease length of stay.

Participants Selection

You are being asked to participate in this study because you are a physiotherapist who currently works in the ICU of a hospital in Ontario that is similar in size to WOHS's ICU and provides the same types of services, including mechanical ventilation.

What is involved

If you agree to voluntarily participate in this research, your participation will include a 10 - 15 minute telephone interview at a mutually predetermined time. You will be asked a series of questions by the researcher to determine how much and what kinds of physiotherapy are provided in your ICU. Notes of the interview will be made by the researcher via computer.

Inconvenience

Participation in this study may cause some inconvenience to you, including time of 10-15 minutes.

Risks

There are no known or anticipated risks to you by participating in this research.

Benefits

The potential benefits of your participation in this research include the improvement of ICU patient outcomes and decreasing the length of ICU and hospital stay

Voluntary Participation

Your participation in this research must be completely voluntary. Even though you may be professionally acquainted with the researcher, this should not influence your decision whether or not to participate. If you do decide to participate, you may withdraw at any time without any consequences or any explanation. If you do withdraw from the study your data will be destroyed and not be used.

Anonymity

In order to protect your anonymity the researcher will assign your hospital a number. Your name will be used only to contact you for the interview, and will not be documented in any research materials or results.

Confidentiality

Your confidentiality and the confidentiality of the data will be protected by ensuring that your hospital will be assigned a number only (i.e.: 1, 2, 3) and your name will not be documented in any research materials (the questionnaire) or results.

Potential Limits to confidentiality

The hospitals which will be compared with WOHS will be identified by the Medical Director of Critical Care at WOHS, who may therefore be able to infer who participated. The small sample size may make it possible to infer who participated. Also, some participants may require the permission of their supervisor in order to participate in the study.

Dissemination of Results

It is anticipated that the results of this study will be shared with others in the following way: thesis/dissertation/ class presentation. The results will also be shared with the client, who is the Medical Director of Critical Care at WOHS, in order to implement changes and solutions which will improve patient outcomes and decrease length of stay.

Disposal of Data

Data from this study will be disposed of 1 year post study. All electronic data will be erased and any paper copies will be shredded.

Contacts

Individuals that may be contacted regarding this study include the researcher and/or supervisor. Please see above for contact information.

In addition, you may verify the ethical approval of this study, or raise any concerns you might have, by contacting the Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

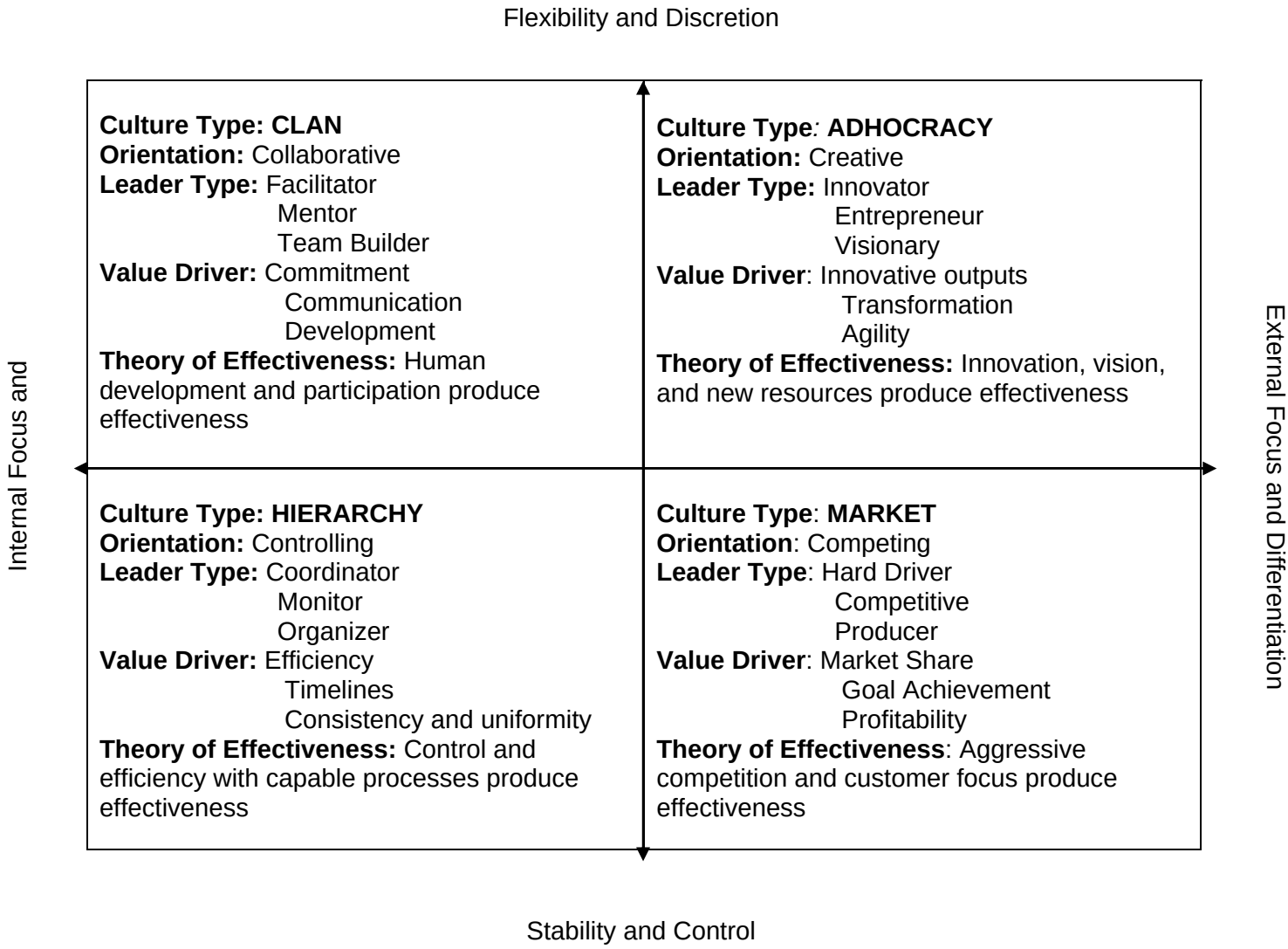
Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

Name of Participant	*Signature*	*Date*

A copy of this consent will be left with you, and a copy will be taken by the researcher.

Appendix 'D' - The Competing Values of Leadership Effectiveness, and Organizational Theory

(Reprinted from Cameron and Quinn, 2004)



Appendix 'E' - The Organizational Culture Assessment Instrument

(Cameron & Quinn, 2004)

1 – Dominant Characteristics	Now	Preferred
A The organization is a very personal place. It is like an extended family. People seem to share a lot of themselves.		
B The organization is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.		
C The organization is very results-oriented. A major concern is with getting the job done. People are very competitive and achievement-oriented.		
D The organization is very controlled and structured place. Formal procedures generally govern what people do.		
Total	100	100

2 – Organizational Leadership	Now	Preferred
A The leadership in the organization is generally considered to exemplify mentoring, facilitating, or nurturing.		
B The leadership in the organization is generally considered to exemplify entrepreneurship, innovation, or risk taking.		
C The leadership in the organization is generally considered to exemp a no-nonsense, aggressive, results-oriented focus.		
D The leadership in the organization is generally considered to exemplify coordinating, organizing, or smooth-running efficiency.		
Total	100	100

3 – Management of Employees	Now	Preferred
A The management style in the organization is characterized by teamwork, consensus, and participation.		
B The management style in the organization is characterized by individual risk taking, innovation, freedom, and uniqueness.		
C The management style in the organization is characterized by hard-driving competitiveness, high demands, and achievement.		
D The management style in the organization is characterized by security of employment, conformity, predictability, and stability in relationships.		
Total	100	100

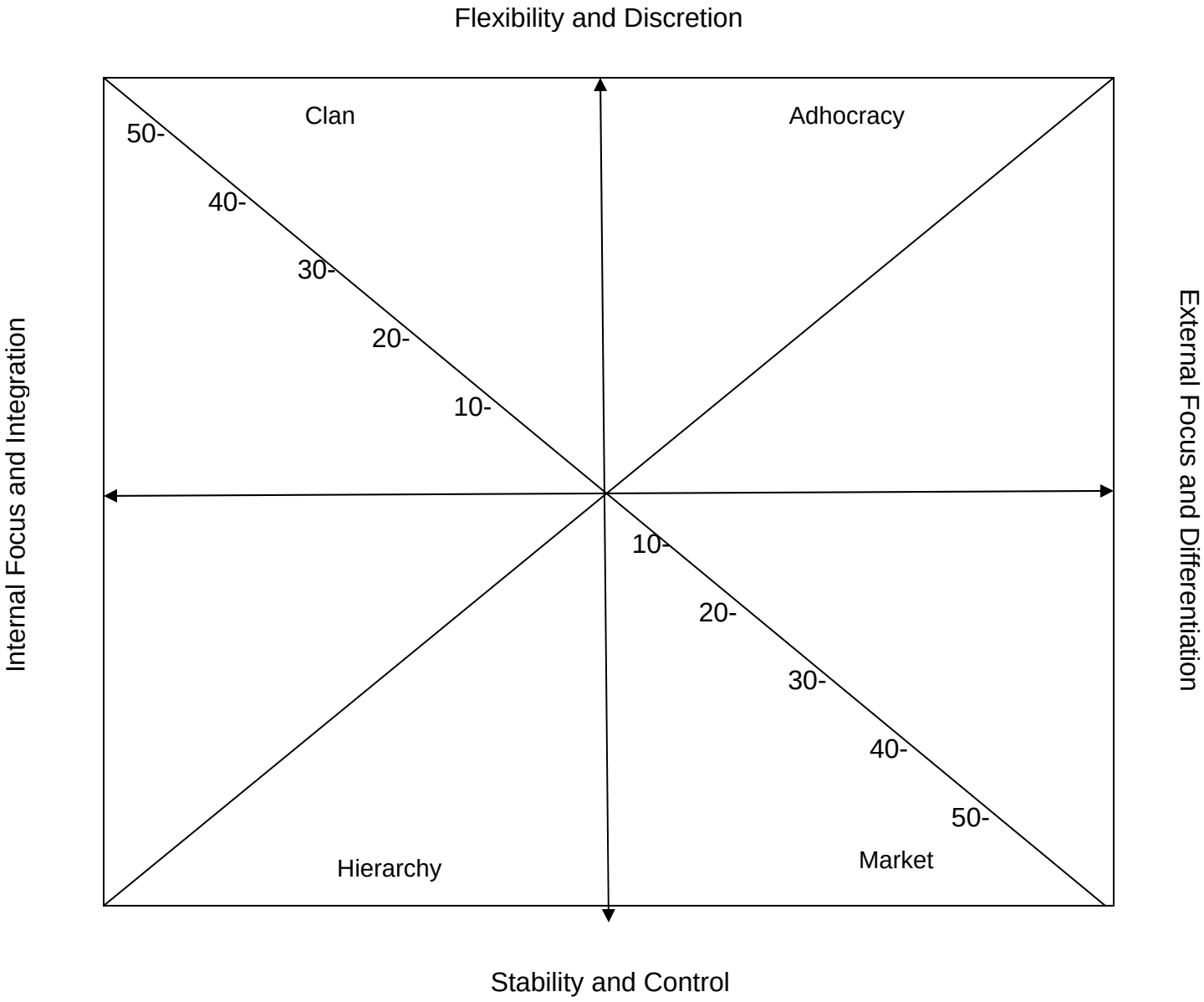
4 – Organizational Glue	Now	Preferred
A The glue that holds the organization together is loyalty and mutual trust. Commitment to this organization runs high.		
B The glue that holds the organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge.		
C The glue that holds the organization together is the emphasis on achievement and goal accomplishment.		
D The glue that holds the organization together is formal rules and policies. Maintaining a smooth-running organization is important.		
Total	100	100

5 – Strategic Emphasis	Now	Preferred
A The organization emphasizes human development . High trust, openness, and participation persist.		
B The organization emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.		
C The organization emphasizes competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant.		
D The organization emphasizes permanence and stability. Efficiency, control, and smooth operations are important.		
Total	100	100

6 – Criteria for Success	Now	Preferred
A The organization defines success on the basis of the development of human resources, teamwork, employee commitment, and concern for people.		
B The organization defines success on the basis of having the most unique or newest products. It is a product leader and innovator.		
C The organization defines success on the basis of winning in the market place and outpacing the competition. Competitive market leadership is the key.		
D The organization defines success on the basis of efficiency. Dependable delivery, smooth scheduling, and low-cost production are critical.		
Total	100	100

Appendix ‘F’- Organizational Culture Profile Template

(Reprinted from Cameron & Quinn, 2004)



Appendix ‘G’ – Organizational Culture Profile Item Set

(O’Reilly, Chatman, & Caldwell, 1991, p. 516)

1 – Flexibility

2- Adaptability

3 – Stability

4 – Predictability

5 – Being innovative

6 – Being quick to take advantage of opportunities

7 – A willingness to experiment

8 – Risk taking

9 – Being careful

10 – Autonomy

11- Being ruled oriented

12 – Being analytical

13 – Paying attention to detail

14 – Being precise

15 – Being team oriented

16 – Sharing information freely

17 – Emphasizing a single culture

18 – Being people oriented

19 – Fairness

20 – Respect for the individual right

21 – Tolerance

22 – Informality

23 – Being easy going

24 – Being calm

25 – Being supportive

26 – Being aggressive

27 – Decisiveness

28 – Action orientation

29 – Taking initiative

30 – Being reflective

31 – Achievement orientation

32 – Being demanding

33 – Taking individual responsibility

34 – Having high expectations for performance

35 – Opportunities for professional growth

36 – High pay for good performance

37 – Security of employment

38 – Offers praise for good performance

39 – Low level conflict

40 – Confronting conflict directly

41 – Developing friends at work

42 – Fitting in

43 – Working in collaboration with others

44 – Enthusiasm for the job

45 – Working long hours

46 – Not being constrained by many rules

47 – An emphasis on quality

48 – Being distinctive-different from others

49 – Having good reputation

50 – Being socially responsible

51 – Being results oriented

52 – Having a clear guiding philosophy

53 – Being competitive

54 – Being highly organized