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Prospectus for Decreasing Lab Specimen Errors

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Prospectus of Decreasing Lab Specimen Collection and Labeling Errors in a High-Volume Women's Health Ambulatory Care Clinic

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Abstract

It has been estimated that >160,000 adverse patient events occur each year in the United States because of patient or specimen identification errors involving the laboratory (Sandhu, et. al 2017). The overall effect of specimen labeling errors often leads to patient safety issues related to medication errors, misdiagnosis, and delays in care (Sandhu, et. al 2017). The Women's Clinic (WC) an outpatient clinic located within a larger northern California acute care facility had noted a significant increase in the number of lab years in the last year. This clinic sees on average four hundred patients and collects hundreds of specimens daily. In the time from October 2018 to April 2019, the lab error rate on average has been around 8 errors per month. The purpose of this project is to implement education for the medical assistant staff to learn how to focus on the goal of the following: properly label lab specimens, use the right culture medium for specific labs, to properly close the lab specimen containers, and place the specimen in the proper bin (pathology vs laboratory) for both pick up and processing. With the plan to reinforce the education on correct laboratory specimen collection, labeling and processing with resulting in, a 50% decline of the lab error rate and substantial cost-savings.

Introduction

The purpose of this project is to implement education for the medical assistant staff to learn how to properly label lab specimens, use the right culture medium for specific labs, to properly close the lab specimen containers, and place the specimen in the proper bin (pathology vs laboratory) for pick up and processing. The aim of this project is to reduce the laboratory errors in the Women's Clinic from an average of 8 per month by 50% to an average of 4 per month by April 30th, 2019 through the use of increased education, knowledge, and more efficient workflows. This organization has a dedication to clinical service excellence and encourages an environment that works on teamwork, promotes compassion, and is very dedicated to patient care (Kaiser, 2018).

Problem Description

High staff turnover, numerous daily sick calls, increasing demand for patient driven access and increasing tasks that must be completed prior to a provider seeing patients are all contributing factors to the increasing number of lab error generated from the Women's Clinic. A root cause analysis (Appendix A) and SWOT analysis (Appendix B) was conducted and concluded that most lab errors occurred during the following times: lunch coverage, at the end of the day, on days when the medical assistants were sharing providers and when the residents held a clinic. Staff were observed not properly handing off their patient assignments during the lunch hour and at the end of their shift.

A lack of communication was noted when multiple medical assistants (MA) where required to share providers during times when the unit was short staffed. This was especially evident when the residents were in clinic and did not have a specific MA assigned to them,

which resulted in multiple handoffs and lab specimens either being lost or mislabeled. The purpose of this project is to educate staff members on the importance of proper lab specimen labeling and their role in this process to ensure proper lab handling, labeling, and data collection are obtained so that our patients receive accurate lab results back in a timely manner.

Available Knowledge

Laboratory tests help direct and determine how healthcare providers are going to treat and diagnose; therefore, labeling a specimen correctly is crucial to providing safe care and essential to ensuring the patient receives appropriate treatment based on the correct diagnosis. The PICOT question used to search for current literature asked in outpatient clinics (P), how does efficient workflows (I), compared to current workflows (C), affect the rate of lab specimen labeling and collection errors (O), over the course of a calendar year(T)?

Evaluating the "source" of lab specimen errors an article by Abdollahi et al; (2013) focused on the three phases of which lab specimen errors may occur. These phases are defined as: preanalytical, analytical, and postanalytical. The preanalytical errors occurs prior to the specimen being sent to the lab for processing. These type of errors may be caused by the following factors: incorrect order placed, improper patient identification, improper collection (wrong medium used, sample size not big enough), improper transportation (placed in wrong bin for pick-up which leads to specimen being sent to wrong area for processing- local facility vs. outside facility, lab vs pathology, etc). Green, (2013) also looked at lab specimen errors from this perspective and further noted the prevalence of medical errors which represents the eighth leading cause of death in the United States. For the clinical laboratory, errors that occur in the preanalytical phase of testing may account for up to 75% of total laboratory errors; 26% of these may have detrimental effects on patient care, which contribute to unnecessary investigations or

inappropriate treatment, increase in lengths of hospital stay, as well as dissatisfaction with healthcare services. The results focused on the different phases of lab errors, with evidence that in the preanalytical phase, it could affect clinical and financial outcomes.

The Joint Commission (TJC) also acknowledged specimen identification errors and released a National Patient Safety Goal (NPSG) in 2014 to address the issue. The NPSG called for healthcare providers to use two patient-specific identifiers, such as name and date of birth, to ensure each patient received the correct medication or treatment (The Joint Commission, 2014). TJC revised this NPSG in 2017 to include the additional criteria: labeling the specimen in the presence of the patient. (The Joint Commission, 2017).

Methods

Five teaching points have been identified. The teaching plan will be implemented over a three-month period. One teaching point will be discussed each week during daily huddles for five weeks. The entire teaching plan will be the focus of the unit's next two staff meetings that occur monthly (Appendix B). Presentation will be given by the laboratory error reduction task force champions. With each teaching point a competency has been developed and will be signed once the learner has mastered the criteria successfully.

A Gannt chart has been created to track our progress (Appendix C). A laboratory error reduction task force will be created to serve as champions for this project. The champions will include: eight union-based team members (UBT), two Lead Medical Assistants (MAs), one Charge Nurse, and the Nurse Manager. These group will also have the occasional assistance of a project manager and a clinical nurse leader (CNL) student. The core twelve champions will be the driving force for this project's completion, success, and sustainability. Education will begin

with addressing the effect that a laboratory error has on the patient's care experience and/or medical diagnosis.

Market Analysis

An outpatient Women's Clinic (WC) is the microsystem that was focused on for the purpose of this paper. The WC is located within a well-known private healthcare entity that focuses on preventative healthcare services and prides itself on providing high quality levels of care throughout the patient care continuum. This facility is located within the SF greater bay area in a bustling suburban neighborhood. This medical center has received the top score of an "A" rating by the Leapfrog Group on its annual safety report for 2019. At the same time, Leapfrog also this healthcare entity as one of the top teaching hospitals in the US, one of only 9 in California and one of only 53 in the United States based on data comparing 2,600 hospitals throughout the United States (Kaiser Permanente, 2019). This private healthcare entity's mission is to provide high-quality, affordable health care services and to improve the health of its' members and the communities that they serve (Kaiser Permanente, 2018). Keeping patient safety as a top priority has enabled this healthcare entity to be known as leaders in the healthcare field regarding innovation and patient safety practices.

The WC is a sub-component of the MOB and houses thirty-one exam rooms, three procedure rooms, twenty-four doctors, three nurse practitioners, thirty-two medical assistants, one licensed vocational nurse (LVN), six registered nurses (RNs), one nurse director, one nurse manager, one non-nurse manager, and twelve ancillary staff on a daily basis. The WC also houses two sub-specialty clinics (Urogynecology and Gyn-Oncology) within itself and serves around 400 patients per day. The patient population includes female clients, ages fifteen to one hundred plus years old. Majority of the patients are in the range of thirty years of age and older.

Forty-nine percent of our patient population is married, a working professional, non-smoker and has one or less co-morbidity. The other fifty-one percent has two or more co-morbidities present like hypertension, obesity, sleep apnea, asthma, etc. There are many cultures present in the department with a predominantly Asian and Middle Eastern patient population. The patient population is also highly educated and arrives to their scheduled appointments with lots of questions in hand. This organization has a dedication to clinical service excellence and encourages an environment that works on teamwork, promotes compassion, and is very dedicated to patient care (Kaiser, 2018).

Financial Analysis

According to Atwaru et al (2016), losing laboratory specimens generates cost on many levels with cost ranging from $200 to $2000 per incident. From January to March 2019, there were twenty-two lab errors that have been traced back to the Women's Clinic by the laboratory. Each lab error is multiplied by the total number of errors and productive time loss of the employees involved in the incident. As a result, the estimated cost for each laboratory error ranges from $4,400 to $44,000 per incident. Currently the Women's Clinic averages eight lab errors a month, which is an average of ninety-six errors per year. This current trend costs the clinic anywhere from $19,200 to $192,000 yearly (Appendix E). Patient specimen and laboratory testing identification errors comprise the majority of the laboratory errors retrieved from the Women's Clinic.

Laboratory tests help direct and determine how healthcare providers are going to treat and diagnose; therefore, labeling a specimen correctly is crucial to providing safe care and essential to ensuring the patient receives appropriate treatment based on the correct diagnosis. With the plan to reinforce the education on correct laboratory specimen collection, labeling and

processing, we hope to see a 50% decline and save the unit between $9,600 to $96,000 for the year of 2019.

Implementation

Lippit's Change Theory Model

The Lippit's Change Theory Model is composed of seven steps (Appendix F) and is an expansion of Lewin's Model of Change (Appendix G). Lewin's model focuses on three stages: unfreezing which is the process of altering current state, changing where behaviors are modified, and refreezing which happens after the change is implemented (Hawkes & Hendricks-Jackson, 2017). Lippit's model expands on these three core processes and emphases on importance of the "change agent" role during the change process. A CNL is able to embody a variety of essential roles such as—advocate, team manager, information manager, systems analyst/risk anticipator, clinician, outcomes manager, and educator (AACN, 2007b). Harris, Roussel, and Thomas (2018) define CNLs as leaders in healthcare systems who "designs, implements, and evaluates care through coordination and delegation" (p. 5). Enhancing a culture of safety for patients across the continuum of care in both inpatient and outpatient settings, is my vision for the CNL role which is why the Lippit's Change Model was chosen for this project because being a change agent is the essence of the CNL core values.

This theory will serve as our guide to effect change through applying the nursing process of assessment, planning, implementation, and evaluation as we develop best practices guidelines for proper laboratory specimen collection and labeling. Step One: In this step, the nurse manager, CNL, Lead Medical Assistants, and members of the Unit Based Teams (support staff and union representative) have been tasked to identify issues with our current laboratory workflow. The need for change is then made known to other members of staff who will be affected so that

formal meetings can be held to decide on how to move forward. Step Two: In this step, the CNL will assess the unit's receptiveness to change. This individual will also assist the work group with performing a root- cause analysis and SWOT analysis to determine care gaps within the current policies. Steps Three and Four: Require a change agent and its implementation. The CNL will act as the change agent and educate all team members on using evidenced based practices to develop best care guidelines. In this phase the implementation of a staff education teaching plan will be developed as well as staff training competencies. The remaining three phases will focus on educating the staff, documentation and data collection to track our progress and workflow adjustments (Appendix C).

Timeline

The Clinical Nurse Leader and the Nurse Manager will meet with the Union Based Team (UBT) committee to discuss the current lab error issues on the floor in early December of 2018. Through the combined efforts of the union-management partnership (LMP), a waste walk was completed, and a fishbone diagram was created (Appendix A). Staff education will began starting December 2018, the learner will attend daily huddles on proper labeling of lab specimens.

From December 2018 through February 2019 the focus of our daily huddles and staff meetings will focus on the following five objectives. First objective will be to have the staff member verify that an order for a lab specimen or pathology has been placed in the patient's electronic medical record (EMR) prior to entering the patient's room. The second objective will have the staff member identify the proper test medium needed to place lab specimen in. The third objective will have the staff member identify what are two acceptable forms of patient identification that can be used to verify patient information (i.e. full name, date of birth, and/or

medical record number). The fourth objective will have the staff member demonstrate knowledge of the correct bin to place the sample in (lab vs pathology) to ensure that the specimen is sent to correct location for processing. The fifth and final objective will have the staff member recall and teach back the proper way to give a handoff when turning over a patient assignment.

Starting February 2019, we will conduct daily and weekly lab audits to allow us to correct lab errors in live time before they leave the unit for processing. In March 2019, we will implement our first test of change regarding our improved workflows. We will evaluate our progress, validate all data collect, and present our final project findings. By April 30th, 2019 our lab error should have decreased from eight specimens per month to an average of four per month. By the year 2020, if staff has sustained the education and maintained the new workflows, the lab error rate for the WC should have dropped to 50% less of 2019, with an estimate of two. A Gannt chart has been generated to track the WC's progress (Appendix C).

Conclusion

In 1999, the Institute of Medicine (IOM) released an eye-opening report, To Err, Is Human: Building a Safer Health System, which provided details about the number of deaths and injuries caused each year by various healthcare systems. This report initiated collaborative efforts to improve patient safety, from medication errors to anatomical markers to prevent surgical site errors. A follow-up report from IOM in 2001, Crossing the Quality Chasm, continued to trigger conversations about patient safety and quality of care. These reports have shed light on the depth and complexity of improving patient safety and quality care standards,

prompting many health institutions to raise the bar on quality improvement efforts through research, committees, and other means.

Patient safety is essential in healthcare settings and steps must be followed to ensure quality in practice with competencies in medical practice and patient care. The IHI released a white paper regarding guidelines to develop a framework for safe, reliable, and effective care. This paper guides leaders to identify and correct workflow insufficiencies through the use of process mapping, tests of change, ongoing feedback, staff accountability, and transparency to yield long term results (Frankel et al.,2017).

One of the most important steps to know is how ensure the lab specimens are properly obtained and labeled. By giving proper education about lab specimen collection, labeling and handoff, we expect to find a significant decrease lab errors generated from our department. Interventions specific to evidenced based practices must be implemented to maintain the highest levels of patient safety. By following Lippitt's change theory model, we will develop, implement and maintain best practice guidelines. Performance measures will be evaluated one year after implementation of the change strategy to determine its success and reviewed annually to meet evidenced based practice guidelines. According Russ et al (2016) The goals of human factors in health care are to support the health care professional in their work and to promote safe, quality care. Human factors science is about designing systems that are resilient to unanticipated events and modifying the design of the system to better aid people. As long as there is a human component to healthcare delivery systems, the potential for errors to occur exists.

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EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

STUDENT NAME: Sabrina Scruton

DATE: 7/29/2019

SUPERVISING FACULTY: Shelley McNeil

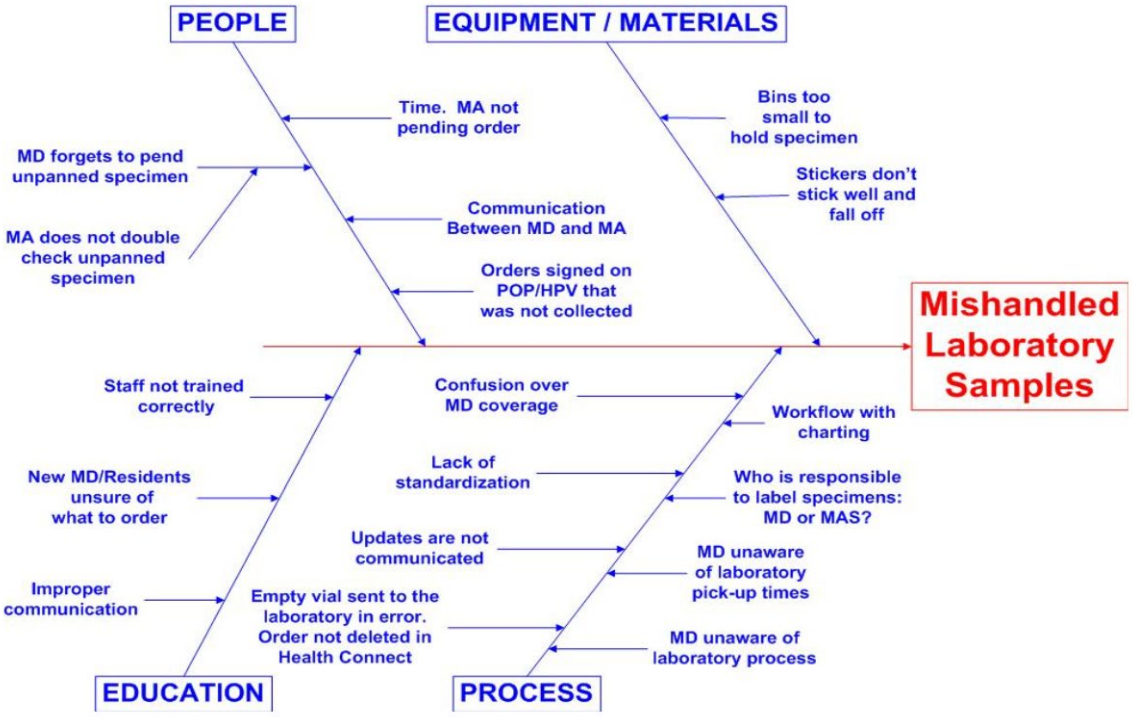
Instructions: Answer YES or NO to each of the following statements:

Project Title:	**YES**	**NO**
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	X	
The specific aim is to improve performance on a specific service or program and **is a part of usual care**. ALL participants will receive standard of care.	X	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does **NOT** follow a protocol that overrides clinical decision-making.	X	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	X	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	X	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	X	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	X	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	X	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: *"This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."*	X	

Appendix A

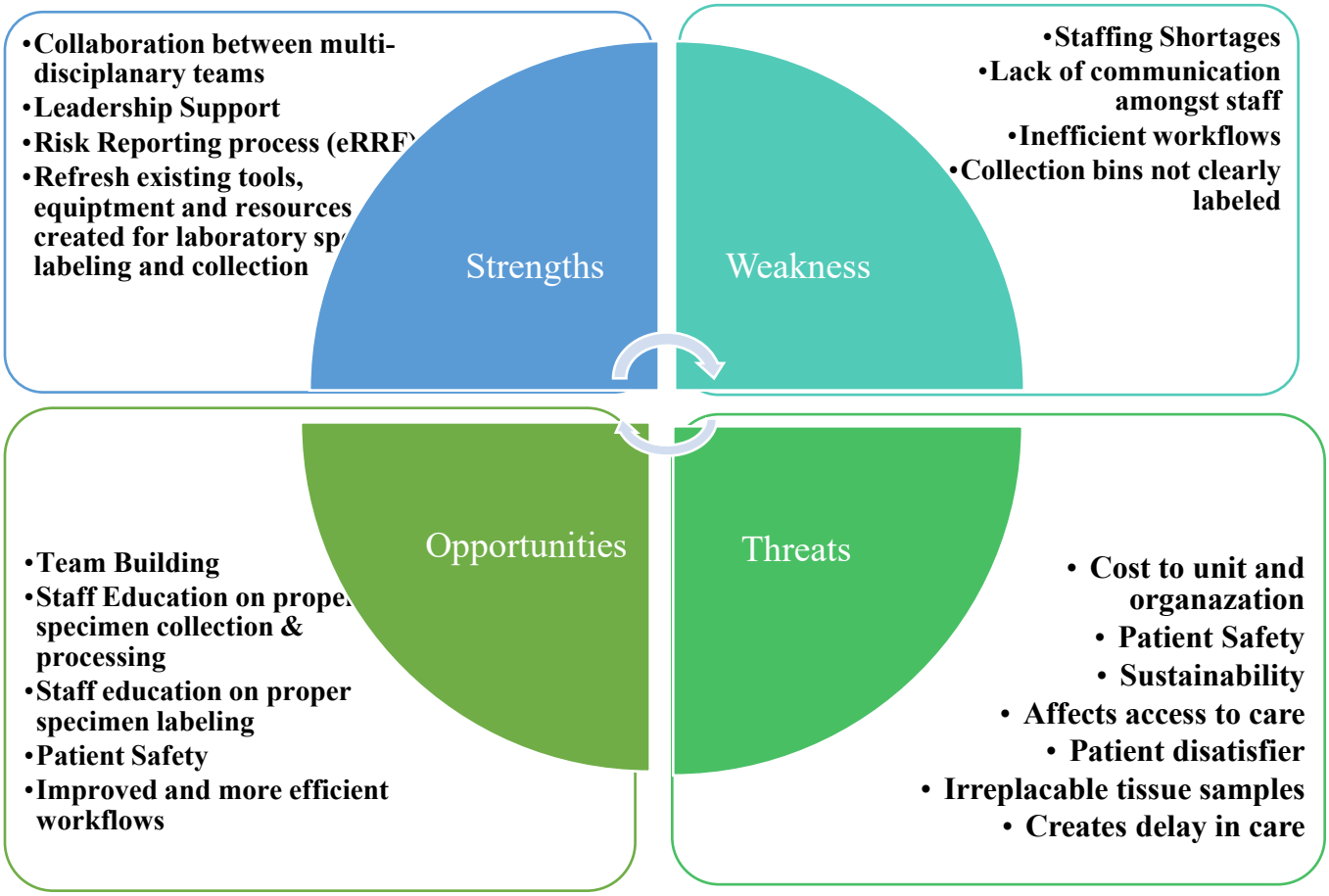
CAUSE AND EFFECT DIAGRAM

PENDING ORDER, NO ORDER AND UNLABELED SPECIMEN



Appendix B

SWOT Analysis



Appendix C

Timeline

Steps	10/18	11/18	12/18	1/19	2/19	3/19	4/19	10/19	12/20
Microsystem Analysis	X								
Topic and Goal Setting		X							
Baseline Data Collection			X						
Project Proposal to UBT			X						
Daily Huddles			X	X	X				
Staff Meeting				X	X				
Lab Audits					X	X			
Improve (Test of Change Cycle) Evaluation of Outcomes					X	X			
Project Outcome Presentation							X		
6-month follow-up (Review lab audits)								X	
Control – Develop Sustainable Plan									x

Appendix D

"Lab Specimen Labeling-teaching plan"

I. Purpose: To ensure that all staff members in the Women's Clinic are aware of the proper way to collect, label, and process lab specimens.

II. Objectives:
- The staff member will verify that an order for a lab specimen or pathology has been placed in the patient's electronic medical record (EMR) prior to entering the patient's room.
- The staff member will be able to identify the proper test medium needed to place lab specimen in.
- The staff member will be able to identify what are two acceptable forms of patient identification that can be used to verify patient information (i.e. full name, date of birth, and/or medical record number (MRN).
- The staff member will demonstrate knowledge of the correct bin to place the sample in (lab vs pathology) to ensure that the specimen is sent to correct location for processing.
- The staff member will recall and teach back the proper way to give a handoff when turning over a patient assignment.

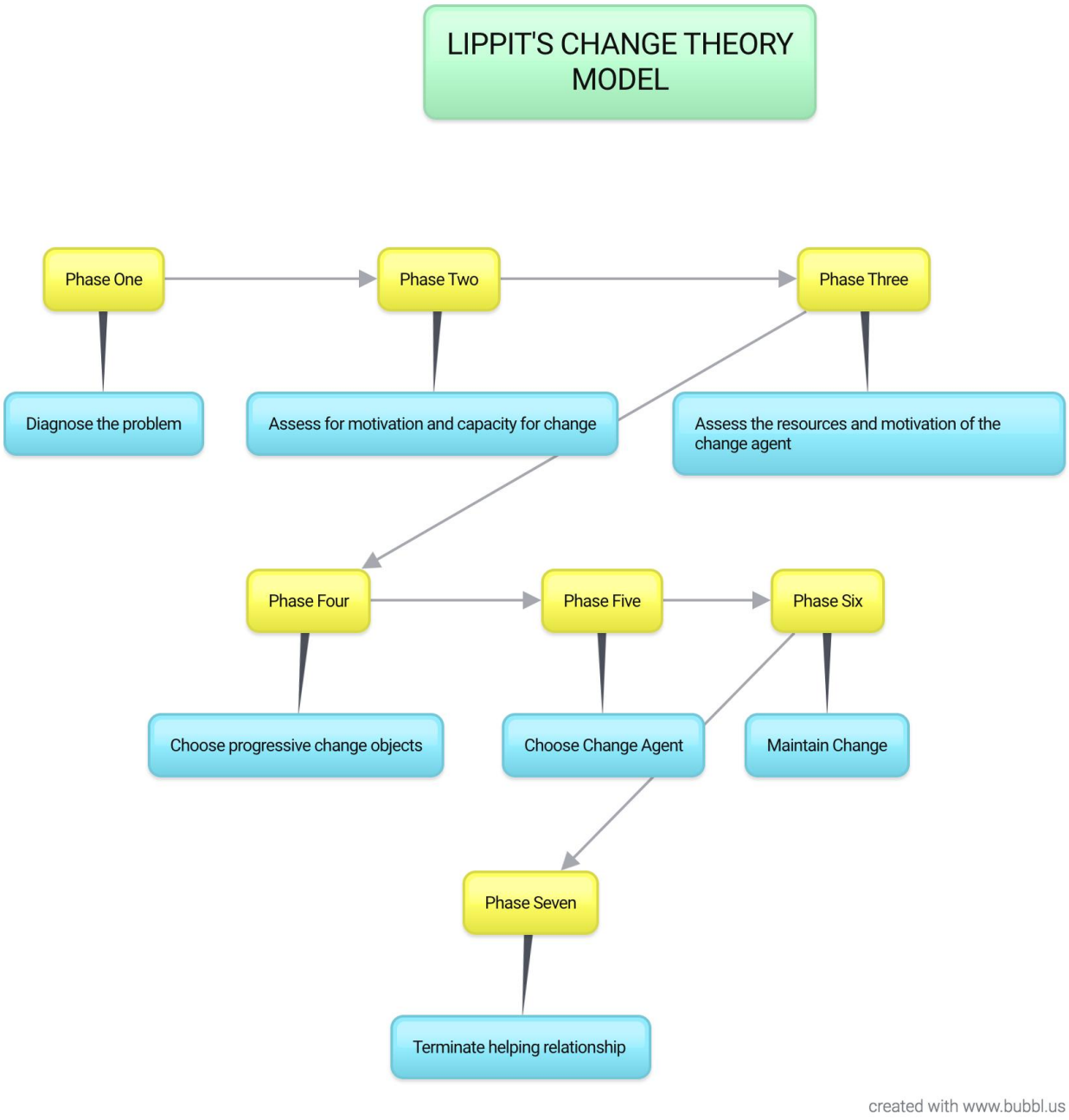
III. Procedure
- The staff will also take a tour of our dirty utility room to demonstrate and identify the correct collection bin to place the lab samples in for processing.
- The staff will role model how to "room" a patient which includes: using two patient identifiers, checking the EMR for a lab order, selecting the proper lab medium, labeling the lab specimen in the presence of the patient, and placing the specimen in the correct collection bin.
- The staff will also role model how to handoff their assignment by using a handoff checklist.

IV. Evaluation
- Staff will complete a pre and post-test to assess knowledge.
- Staff will role model "rooming" a patient-once all elements are addressed a competency will be issued and placed in their training folder.
- Staff will role model the correct way to handoff their assignment. A competency will be signed once a correct handoff is observed and will be placed in their training folder.
- Lab reconciliation reports will be run twice daily until the Women's Clinic maintains three consecutive months with no lab errors reported.

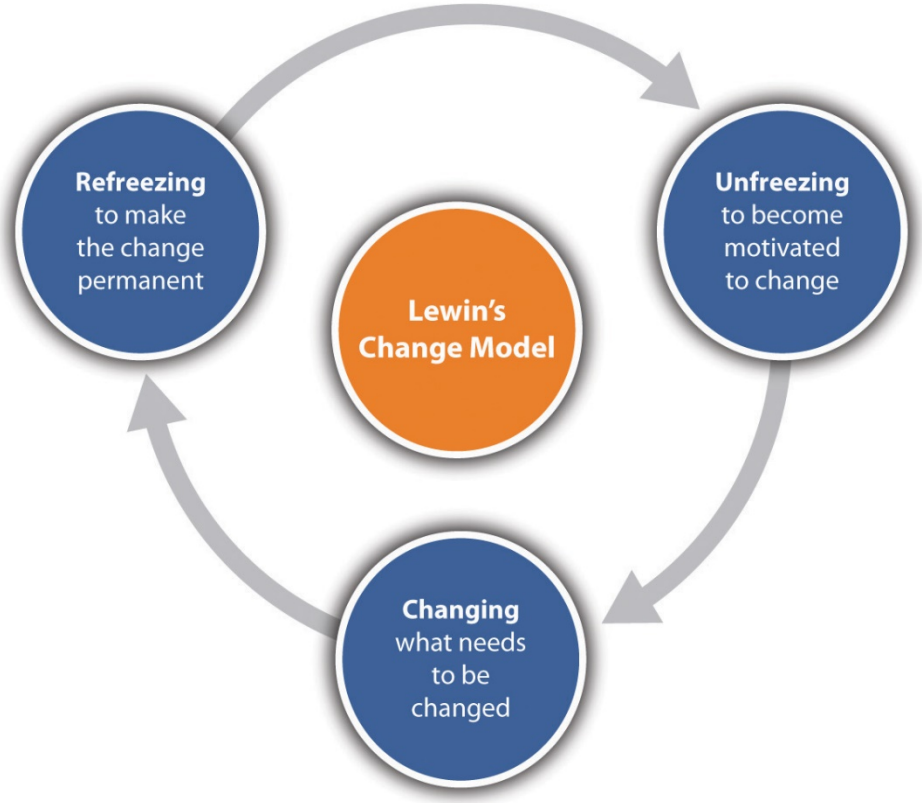
Appendix E

	YEAR	Cost Benefit Analysis	
Cost Description	2018	2019(estimate)	2020(estimate)
# Of Lab Errors	96 total (8 per month)	48 total (4 per month)	24 total (2 per month)
Cost to unit per lab error per month ($200-$2000)	8 x $200=$1600 8 x $2000= $16000	4 x $200= $800 4 x $2000=$8000	2 x $200= $400 2 x $2000= $4000
Cost savings (Benefit)	$19,200 to $192,000 (LOSS)	$19,200-$9,600= $9,600 $192,000-$9,600= $96,000	$19,200- $4,800= $14,400 $192,000-$48,000= $144,000
Cost for training program	0	0	0
Cost of Education re-enforcement	0	0	0
Net Benefit		$9,600 to $96,000 (Benefit)	$14,400 to $144,000 (Benefit)

Appendix F


LIPPIT'S CHANGE THEORY MODEL
Phase One
Phase Two
Phase Three
Diagnose the problem
Assess for motivation and capacity for change
Assess the resources and motivation of the change agent
Phase Four
Phase Five
Phase Six
Choose progressive change objects
Choose Change Agent
Maintain Change
Phase Seven
Terminate helping relationship
created with www.bubbl.us

Appendix G


Refreezing
to make
the change
permanent
Unfreezing
to become
motivated
to change
Lewin's
Change Model
Changing
what needs
to be
changed