AN EVALUATION OF CLINICIAN KNOWLEDGE AND SELF-EFFICACY PRE/POST EDUCATION IN PERISTOMAL MANAGEMENT

by

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A doctoral scholarly project submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Nursing Practice

Charlotte

2019

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ABSTRACT

KIMBERLY SAUNDERS. An evaluation of clinician knowledge and self-efficacy pre/post education in peristomal management. (Under the direction of DR. KATHLEEN JORDAN)

Purpose

The primary purpose of the study was to evaluate the effect of an educational intervention including the use of a clinical reference tool on the clinician's knowledge and self-efficacy scores in peristomal management. A secondary purpose compared the participant's knowledge and self-efficacy based on the education delivery method of online education as compared to in-person.

Design

This education project was a two-group, pre/posttest, descriptive design used to evaluate changes in knowledge and self-efficacy in ostomy management post education intervention.

Subjects and Setting

The study groups included physical therapist, nurse, nurse practitioner, physician assistant, and physician practicing in a variety of healthcare areas in the United States. Online participants (n=64) were scattered geographically across thirteen different states, and the in-person groups (n=89) were located in New Jersey, South Carolina, and Hawaii.

Methods

The groups received education (PowerPoint presentations) and a quick reference clinical tool regarding stomal and peristomal presentations and complications. The

participants completed pre/post education surveys evaluating knowledge and self-efficacy.

Results

For the total sample, there was a statistically significant increase in knowledge scores from pre-intervention to post-intervention, $t(106) = -16.03$, $p < 0.001$ and a statistically significant increase in self-efficacy scores, $t(115) = -6.49$, $p < 0.001$. The knowledge rate of growth was greater in the in-person learning however the self-efficacy scores improved at a higher rate in the online group.

Conclusions

This doctoral project focused on a teaching methodology and its effect on the learner regarding peristomal assessment and treatment. The results have carry-over implications on education techniques and methods of testing knowledge. Online and in-person instruction mutually show improvement in knowledge and self-efficacy. The level of improvement may individually differ according to the teaching methodology and testing approach. Thus, a varied education and testing style is recommended for best knowledge acquisition and implementation into practice.

DEDICATION

To Rodney, my husband and soulmate who consistently supports me and creates an environment for us to thrive in.

To my children, Conner and Emma, your education is a lifetime investment that drives your success. Never stop learning!

ACKNOWLEDGEMENTS

To Dr. Kathleen Jordan, thank you for agreeing to be the Chair of my committee. I was continuously amazed at your ability to critique, mentor, and cheerlead all in one breath! I appreciated your words of wisdom as you encouraged me through this process. I hope that we can work together on future projects.

To Dr. Katie McGuffin and Dr. Teresa Cating, thank you for your suggestions and critique of this project. It is so helpful to see one's work through different eyes.

To Dr. Kelly Powers, thank you for your expertise and guidance in learning a new online platform for data entry and analysis. This new tool will provide many uses as I continue to research in my field.

To Dr. Michael Towler, thank you for the unique insight that a surgeon brings to the conversation as I brain-stormed in the infancy of this project.

To my cohorts in the DNP program, thank you for the cohesiveness in learning as we journeyed through the process of the doctoral degree together. I look forward to reading your research in the journals.

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LIST OF ABBREVIATIONS

ADL	activities of daily living
ANOVA	analysis of variance
CINAHL	Cumulative Index of Nursing and Allied Health Literature
DNP	Doctor of Nursing Practice
OCA	Ostomy Care Associate
PICO	problem, intervention, comparison, outcome
SPSS	statistical analysis software
UOAA	United Ostomy Associations of America
URL	uniform resource locator
WOCN	Wound Ostomy and Continence Nurses Society

CHAPTER 1: Introduction

In the United States of America, there are over 700,000 individuals with an ostomy for diversion of the bowel or bladder (Sheetz et al., 2014). An ostomy is a diversion of the bowel or bladder to an abdominal surgical opening using a loop of the bowel. As documented on the United Ostomy Association of America Inc. (UOAA) website, the Ostomate Bill of Rights document supports all new ostomates have the right to specialized education to achieve a positive quality of life score and decrease complications (2017). However, with hospital shortened length of stay, ostomate education and problem-solving cannot be completed in the acute care setting and thus fall in the venue of the community nurse.

The education required for a new ostomates include stomal care, diet, activity level, and precautions post-operatively to improve patient's self-care abilities and self-confidence after discharge. Studies have shown the education in the short length-of-stay acute care setting was not sufficient to meet the needs of the patient with barriers to patient self-confidence existing when transitioning from hospital to home (Cengiz & Bahar, 2017). The study further noted that outpatient clinic visits alone for education did not meet the daily problem-solving needs of the new ostomate either. Thus, the study implied that two-four weeks of continued education via home care telephone calls and home visits were needed for best patient outcomes (Cengiz & Bahar, 2017).

To provide this patient education in the hospital and the community setting, the clinician must be knowledgeable in stomal and peristomal management. However, nursing school curriculums include only a brief discussion of peri-operative care of the new ostomate, with most clinician knowledge of peristomal care coming from

experience. Additional training and board certification are possible through several certifying options (Wound Ostomy Continence Nurses Society, 2018) however, every community-based setting does not employ a board-certified ostomy nurse. Thus, problem-solving peristomal issues falls on the community-based clinician who has not had focused education in this specialized area.

1.1 Problem Statement

Clinicians demonstrate a gap in knowledge of evidenced-based stomal and peristomal management. Studies have shown improved patient outcomes including decreased peristomal skin breakdown occur when the patient receives special training (Stokes et al., 2017). To meet the need for patient education and self-management, clinicians need additional opportunities to increase their knowledge and skill set.

The Wound Ostomy Continence Nurses Society® (WOCN) has recognized this gap and in 2017 created a tiered approach of education. In addition to full certification, an Ostomy Care Associate (OCA) level was added requiring less pre-requisite education and fewer preceptor hours (Wound Ostomy Continence Nurses Society, 2018). This level still requires 27 hours of education and successful completion of a final examination but is less rigorous.

Some validated tools for the home health nurse to assess and treat the ostomate are available, too (Beitz, Gerlach, & Schafer, 2014). The tools assume a high level of peristomal knowledge, however. The tools show many complicated clinical presentations with recommendations that include referral to a certified ostomy nurse.

Conversely, sometimes the bedside clinician needs a simple rather than complicated tool that assists in assessment and treatment of basic ostomy presentations. Within the

tool, basic pictures of stomal size, height, and exudate presentations provide examples for the clinician to use when assessing the patient. Therefore, providing a tool for ostomy triage is needed for clinicians to use when assessing the patient at bedside. This just-in-time education is a reference that reminds the clinician of presentations and the appropriate treatment. The tool does not require prior ostomy knowledge, but instead can be used as a memory-jogger in problem-solving. Thus, a basic tool provides a tiered approach to education, adding more options for clinicians, but does not replace certified levels of ostomy education programs.

These simple answers to practical questions are lacking in the present more advanced, clinical tools. Also lacking is a generic use of supplies regardless of the ostomy supply company used. This feature in a tool is needed as the bedside clinician makes decisions of ostomy products based on the formulary availability and the payer source requirements.

1.2 Purpose Statements

The primary purpose of this doctoral project was to evaluate the effect of an educational intervention with the addition of a supplemental clinical reference tool on the clinician knowledge and self-efficacy scores in peristomal management.

The secondary purpose of this doctoral project was to compare the participant's knowledge and self-efficacy based on the education delivery method of online education as compared to a face-to-face education intervention. The tool and assessment education was provided with the same material in either online format with voice-over instruction or with a live presenter teaching the same material. Thus, with the same information

presented, a comparison of score changes were evaluated to see if clinicians receiving online education differed from live teaching-sessions.

1.3 Significance of the Project

The certified ostomy nurse demonstrates needed expertise in the assessment and treatment of stomal and perisomal presentations. The ostomate may present in a variety of healthcare settings that do not have a certified ostomy nurse readily available. The frontline clinician (nurse practitioner, nurse, therapist, or surgeon) that assesses the patient may not have the needed knowledge to appropriately problem-solve the stomal presentation. The gap in clinician knowledge coupled with the variety of settings an ostomy patient presents to leads to undesired patient outcomes when a certified ostomy nurse is not readily available.

Thus, a tool is needed for the frontline healthcare worker to use when the ostomate presents with stomal and peristomal complications and a certified ostomy nurse is not readily available. This project implements a quick access tool for assessment and treatment strategies based on five quick questions. This tool can be printed to a pocket-guide size or downloaded electronically to a portable device. It was designed to fit multi-disciplinary skill sets as well as remote service areas. Thus, it addresses the knowledge gap deficit of the non-certified clinician required to problem-solve the stomal and peri-stomal presentation.

1.4 Clinical Question (PICO)

The primary PICO question for this DNP scholarly project was: Do clinicians who participate in a structured educational program including the use of a clinical reference tool, report increased knowledge and self-efficacy in peristomal

management? A secondary PICO question was: Do clinicians who participate in an online education program as compared to instructor-access (face-to-face/ in-person) education program demonstrate a difference in knowledge and self-efficacy scores in peristomal management?

1.5 Project Objectives

The objectives of the educational program are as follows:

- Create and implement a reproducible structured education program with a supporting pocket guide tool for clinicians to use for stomal and peristomal management decisions.
- Evaluate clinician self-efficacy and knowledge pre/post education intervention in the management of stomal and peristomal presentations.
- Evaluate correlation of education style with knowledge and self-efficacy improvement scores.

CHAPTER 2: Literature Review and Theoretical Framework

A literature review was conducted using the PubMed, Medline, and CINAHL databases. The keywords used in the database search included: *home care education, patient simulation, patient education, nurse education, ostomy care, ostomy outcomes, ostomy self-efficacy,* and *ostomy education*. The review included articles from 2007 through 2018. Exclusion criteria included: articles that were not written in English, not in a peer-reviewed journal, or articles that involved stomas other than fecal or urinary. The search led to 19 articles with 16 selected for content. Emerging themes included peristomal complications, patient self-efficacy, and education style.

2.1 Emerging Themes

a) Peristomal complications. In a study conducted by Geng and others (2017) it was demonstrated that quality of life indicators were lower in patients who experienced peristomal complications including skin irritation or pouch leakage. These complications were reported to lead to a decrease in the patient's self-efficacy and ability to adjust to the ostomy. Patients were more likely to resume work and social desired activities for example, when pouch leakage concerns were low.

Six randomized controlled studies support that patients who received evidence-based education on ostomy problem-solving tend to achieve positive outcomes of planned pouch changes without leakage and fewer incidents of peristomal irritation (Adamina, Kehlet, Tomlinson, Senagore, & Delaney, 2011; Stokes et al., 2017; Bare et al., 2017). In addition, the utilization of education through ostomy pathways by ostomy-educated clinicians, resulted in improved effectiveness of care post-operatively and

reduced morbidity (Adamina et al., 2011). Thus, positive ostomy clinical outcomes are associated with specialized assessment and education plans specific for the ostomate.

b) Patient self-efficacy. Patient self-efficacy as it relates to ostomy care is defined as the patient's belief in their ability to perform stomal/peristomal management tasks (Geng et al., 2017). To achieve the desired level of self-efficacy in ostomy management, the patient must learn a new skill set in ostomy care. Clinical best practice guidelines summarize these skills of activities of daily living (ADL) needed to achieve self-care of the stoma. The ADL tasks of peristomal management include: pouch emptying, pouch changing, stomal and peristomal assessment, problem-solving for pouch leakage or irritated skin, diet, and when to seek medical intervention (Prinz et al., 2015).

In order for the patient to achieve ostomy self-efficacy, they will need to be confident and self-sufficient in the listed ADL skills of ostomy care (Prinz et al., 2015). Thus, the patient requires training. The timing and style of training the patient receives varies according to healthcare setting and clinician expertise. The next section compares, and contrasts patient outcomes related to the teaching method and when the education occurs (the education style).

c) Education style. When clinically able, the pre-operative timing of patient education (versus postoperative alone) positively correlates with improved postoperative outcomes of improved patient self-efficacy scores and decreased peristomal complications (Chaudhri et al., 2005). Interestingly, adding hands-on education preoperatively in the patient's home environment further improved outcome parameters compared to verbal education alone (Stokes et al., 2017). Therefore, patients as adult

learners retain more information when the education adds a hands-on delivery method in addition to verbal instruction and begins pre-operatively.

In the emergent surgical ostomy patient, the first education can't occur until recovering after surgery (Taneja et al., 2017). Post-operatively, the hospital stay for ostomy surgeries can be as short as two to four days depending on the surgical approach. To become competent and self-confident in self-ostomy care, the patient will need more education than the short two to four post-operative days in the recovering acute care patient (Chaudhri et al., 2005; Taneja et al., 2017). Thus, the education will continue post-hospitalization.

In the community setting of the home or outpatient clinic the education continues. Cengiz and others (2017) investigated the setting for teaching further and found patients' best retention of knowledge was provided in the home setting versus outpatient. Specifically, they found home health education visits of at least four weeks (versus outpatient follow-up and phone calls alone) was needed in order to meet the achievement of problem-solving and ostomy self-care skills (Cengiz, 2017).

The provider who instructs the patient learning is part of the education style discussed in the literature. When a certified ostomy clinician directs the patient-centered education, there is an association with positive patient outcomes (Adamina et al., 2015; Cengiz & Bahar, 2017; Chaudhri et al., 2005; Prinz et al., 2015; Stokes et al., 2017). This evidence-based education optimally begins pre-operatively, including verbal discussion, written material, and return demonstration of ostomy management tasks. However, education must continue post-operatively in the healthcare setting of the patient. The

next area of inquiry evolved around the level of knowledge of the clinician that is educating the patient in ostomy care.

2.2 Concept Link of Patient to Clinician

The emerging themes in the literature show decreasing peristomal complications, improving patient self-efficacy in ostomy care, and patient-centered education result in ostomate best outcomes (Chaudhri et al., 2005). Furthermore, Bare and others found the more advanced level of knowledge the nurse has in ostomy care, the higher the patient scored in knowledge and self-efficacy with ostomy care (2017). Ultimately, patient knowledge and self-efficacy in ostomy care is directly affected by clinician knowledge and self-efficacy in ostomy care (Colwell, McNichol, & Boarini, 2017; Sheets et al., 2014).

a) Patient knowledge from clinician knowledge. Studies on clinician ostomy knowledge reflected improved knowledge scores from pre to post education (Dillard-Thompson, 2015; Pyle, 2015; Bare et al., 2017; Beitz et al., 2014). Knowledge included clinician problem-solving peristomal problems but also how to teach the patient how to problem-solve. As the clinician knowledge increased, the patient knowledge increased.

b) Patient self-efficacy from clinician self-efficacy. Some studies compared nurse self-efficacy in peristomal management pre and post education and found significant improvement in scores. Other studies identified that adding hands-on education with visuals to reinforce new knowledge demonstrates improved nurse scores in self-efficacy (Pyle et al., 2015) and self-confidence (Pyle et al., 2015; Bare et al., 2017) and improved nurse knowledge application (Dillard-Thompson, 2015; Pyle et al., 2015; Bare et al., 2017; & Beitz et al., 2014).

Clinician self-efficacy improvement paralleled patient perceptions of improved peristomal management after education (Pyle, 2015; Bare et al., 2017; Beitz et al., 2014). In these studies, whether clinician or patient, self-efficacy improved as knowledge improved. Thus, to improve the nurse self-efficacy scores in ostomy care, the nurse knowledge must improve first in peristomal management.

Nursing school curriculums include diversion surgeries and peri-operative care, but additional training and board certification are possible through certifying options (Wound Ostomy Continence Nurses Society, 2018). The United Ostomy Association of America (UOAA) recommends each ostomate receive stomal education under the direction of this ostomy certified clinician (UOAA, 2018). In the absence of a specialized clinician an ostomate may receive education from a clinician that is not board certified.

The Wound Ostomy Continence Nurse Society® (WOCN) has developed an ostomy care associate (OCA) program to extend the knowledge of the frontline nursing/clinician team (Wound Ostomy Continence Nurses Society, 2018). The OCA online course is 27 contact hours and additional preceptor hours (Wound Ostomy Continence Nurses Society, 2018). This program does not answer the problem of just-in-time tools for the clinician to use in ostomate treatment until a certified ostomy clinician can direct the care. There is a need for this level of tool to fill the gap.

Patient self-efficacy results from improved patient knowledge. Patient's improved knowledge directly links to the level of clinician knowledge. As the clinician ostomy knowledge improves, the clinician self-efficacy scores improve. Thus, clinician knowledge in ostomy care with resulting clinician self-efficacy impacts patient knowledge and resulting self-efficacy.

2.3 Variations in Education Methods

For best peristomal clinical outcomes, the clinician knowledge must exhibit higher forms of thinking such as analyzing and evaluating concepts, processes, procedures, and principles. Higher thinking extends beyond recall of facts like teaching a patient a step-procedure of pouch change. Assessing and treating pouch leaking and peristomal complications utilizes extended cognitive levels of analyzing and evaluation. Thus, the clinician must achieve this higher level of thinking through education.

Retention and application of new knowledge varies according to the learner and the presented education style. Current recommended adult education styles include a combination of passive and active learning through verbal, written, and interactive teaching situations (Billings & Halstead, 2016). These style combinations assist with short-term memory retention of information. If the clinician works in a clinical area that uses this new knowledge skill repetitively, the skill-knowledge will transition from short-term memory to long-term and muscle memory (Billings & Halstead, 2016).

However, if the clinician has a sporadic need to use new knowledge, long-term memory creation is unlikely. Therefore, passive and active learning can be supplemented through reference tools triggering the initial learning memory but used at sporadic times in the future. Algorithms and picture reference-tools are two examples of effective and efficient clinical memory joggers.

2.4 Literature Summary

Clinician knowledge in ostomy care with resulting self-efficacy positively correlates to patient knowledge with resulting self-efficacy in ostomy care. To improve outcomes for the ostomate, the patient needs access to a clinician who can demonstrate

evidenced-based stomal and peristomal management. In the absence of a board-certified ostomy nurse, the clinician must problem-solve peristomal issues.

There is a gap in knowledge in ostomy complication management for the front-line clinician. This gap is difficult to overcome and retain with education alone when the clinician uses this knowledge sporadically due to infrequent exposure to ostomy patients. Clinical tools can assist as memory joggers for clinicians and are available through several studies. However, many of these assessment guides assume a high level of ostomy knowledge. Thus, there is a need for available tools designed for the frontline clinician level of knowledge in ostomy care.

2.5 Theoretical Framework

Often, the first time a clinician seeks further knowledge occurs after the current patient problem solving interventions have failed. Without specialized certification in ostomy care, each clinician experience with ostomates may vary. Thus, the clinician may experience failures in addition to successes in ostomate care. Failure becomes an intrinsic motivator for a change of usual practice due to a leaking pouch or undesired outcomes (Mitchell, 2013).

The intrinsic motivator of failure provides a stepping stone for applying Lewin's Change theory. Implementing a change in education practice requires the learner to proceed through various stages. Lewin's change theory describes these changes.

a) Lewin's change theory. Lewin identified the steps a learner progresses through as unfreezing, moving, and refreezing (Mitchell, 2013).

Lewin's unfreezing (behavior) stage. The unfreezing stage involves moving away from the usual way of doing things. Two effective manners to encourage this occurs by

highlighting the driving force (negative or unfulfilled patient outcomes) and dampening the constraining force (limited access to knowledge).

This first step involves discussion of experienced patient negative outcomes of leaking and skin irritation, the treatment ordered, and the success or failure of the treatment. This begins the discussion of identified needs. The next step includes discussing barriers to obtain the knowledge needed to effectively assess and treat ostomate complications. This conversation increases awareness, preparing the learner for the moving behavior stage.

Lewin's moving (behavior) stage. The second stage is moving the old behavior to new behavior. Three actions motivate this different conduct. The first action assists the learner to identify outcomes unachieved. For example, asking the group of clinicians if they've ever treated patients needing to change their pouch every day due to leaking, experienced skin erosions hard to heal, or had difficulty determining which pouching system would manage the clinical presentation?

The second action is to identify with common problems which promote clinician buy-in for opportunity change. To create clinician buy-in, the interventions include providing a tool and education that addresses common difficulties while respecting clinician's limited time and financial constraints. Two options for just-in-time information include cost-effective pocket-guide tools or smartphone electronic applications. These resources provide learning tools for clinicians treating ostomates in a variety of healthcare settings.

The third action with moving behavior is the commitment and buy-in from stakeholders in a leadership position. This requires approval for learners to purchase tools

to use. It also requires leadership approval to attend education sessions needed for job functions such as peristomal management.

Lewin's refreezing (behavior) stage. The third stage of refreezing solidifies the changed behavior as it becomes the common new way of doing things. The usage of an education tool as an algorithm provides a reference pathway rather than reverting to old habits of ostomy care. Formal means (policies) and informal means (positive outcomes and success with usage) stabilize the new pattern of behavior of tool algorithm usage for ostomy management. Therefore, joint visits (live or via telehealth) using the tool while assessing an ostomate reinforces tool and user effectiveness. User effectiveness adds to buy-in and longevity of behavior change.

b) Barriers to change and proposed resolutions. Barriers may present through any or all of the phases of change. Anticipating and identifying barriers becomes essential in the ongoing evaluation of any implementation project. Some barriers anticipated include knowledge deficit and dissemination of the information.

Knowledge deficit. In addition to interweaving change theory in the strategic plan, barriers to change must be identified with proposed resolutions to overcome. The primary obstacle to effective peristomal management lies in knowledge deficit. Not every healthcare system employs a certified ostomy nurse. Thus, the frontline clinician performs assessment, treatment, and problem-solving.

As a recall however, the United Ostomy Association of America (UOAA) recommends a board-certified nurse to be involved in the ostomate plan of care due to the adverse patient outcomes when this specialty is not involved (UOAA, 2018). The implication is the frontline clinician does not have the level of knowledge needed to

assess and treat peristomal complications. A barrier to change can occur when an organization as a whole or the frontline clinicians individually do not recognize this knowledge deficit and the implications.

Dissemination of information. The other significant barrier focuses on dissemination of information. Education hours away from clinical hours creates time conflicts and workload challenges. Thus, a clinical tool must be available in multiple delivery methods to meet the needs of the individual clinician. A variety of delivery methods reaches numerous learning styles with the goal to give the learner options of learning.

2.6 Summary of Literature Review and Theoretical Framework

Lewis' change theory provided a framework of steps needed as a strategic plan developed for this education project. Nurse self-efficacy, self-confidence, and knowledge application show improvement when education includes hands-on. High self-efficacy and self-confidence scores provide internal motivation to re-freeze new practice models learned in an education strategic plan. Thus, an education plan grounded in Lewis' change theory evaluated changes in clinician scores of self-efficacy and knowledge pre and post education.

CHAPTER 3: Project Design

This education project was a two-group, pre/posttest, descriptive design used to evaluate changes in knowledge and self-efficacy in ostomy management post education intervention. The study groups included health care clinicians of disciplines including physical therapist, nurse, nurse practitioner, physician assistant, and physician practicing in a variety of healthcare areas in the United States.

3.1 Setting

There were two settings for this DNP Scholarly Project: an online group and a live seminar group. The first setting was an online group who completed a computer-based course via an online platform Qualtrics (www.qualtrics.com). This was viewed from the participants' computer at their convenience during a one-month time-frame. The second group setting was a face-to-face course taught at three different locations with interaction of the instructor/attendee.

3.2 Population and Recruitment

The online population included convenience samples of clinicians (operationally defined as nurses, physical therapists, nurse practitioners, physician assistant, or physician). In the six months preceding the project implementation, these clinicians attended wound seminars taught by the doctoral nursing practice (DNP) student. At the time of the previous event, they were asked if interested in a future electronic ostomy education and study. If interested the clinicians gave their email address for future contact.

Prior to the beginning of the project, the online group received a reminder of the upcoming project via a participant recruitment email (see Appendix A). The online

sampling group totaled 220 clinicians living in 13 different states. A second email was sent containing a Qualtrics link to anonymously complete an ostomy education project during a timeframe of September and October of the year 2018. The group received a reminder email each week for three consecutive weeks until the end of the survey (see Appendix B). Of the 220 clinicians receiving the online invitation, 64 accepted and completed the consent, surveys, tests, and education launched within the Qualtrics secure online platform.

The face-to-face group derived from clinicians attending live seminars taught by the DNP student. These teaching sessions occurred in three different states as part of a larger education event. At registration for the larger education event, the attendees were given a participant recruitment email explaining the project (see Appendix C). The face-to-face population received the ostomy education regardless of whether they wanted to be part of the implementation project. Notably though, 100% of the face-to-face group decided to consent for their test results to be used for the project. The in-person group totaled 89 clinicians.

3.3 Tools and Implementation

The online group received the invitation link via email. The link directed the participant to the Qualtrics online platform containing all of the tools and the links to the education PowerPoints. The platform required the participant to answer yes to the consent (100% consented yes) to continue through the study (see Appendix D). If the participant answered no to the consent question, the survey stopped, and the participant received a thank-you statement for considering the study.

Next the Qualtrics platform allowed the online participant to complete a demographic survey (see Appendix E). These questions identified their

- discipline,
- years of experience,
- level of education,
- work setting,
- ostomy education in college,
- exposure to ostomy patients, and
- belief of whether ostomy education would be beneficial.

The demographic survey was followed by a pre-education self-efficacy test (see Appendix F). The five-point Likert scale measured their self-perceived confidence in multiple clinical aspects of ostomy care. These included their ability to

- provide best-practice care of peristomal presentations,
- identify stomal and peristomal complications,
- treat peristomal skin breakdown,
- determine what ostomy supplies to order for a patient's stoma,
- measure a stoma and correctly cut/mold, size the flange to the stoma, and determine what to do when a pouch keeps leaking.

After the self-efficacy test, the online participant completed a pre-education knowledge test (see Appendix G). The questions included formats of true/false and multiple choice. Each question provided an option to answer, "I don't know". The rationale for the use of this answer was to determine true knowledge verses the ability to

guess the answer correctly. Test questions queried their understanding in stomal and peristomal management. The questions included knowledge in:

- pouch presentations,
- when to use convexity pouches,
- etiology of peristomal erythema at edge of pouching system,
- pouching treatment of a stomal prolapse,
- average wear time of a pouch,
- purpose of the flange/wafer,
- when mucocutaneous separation complication occurs,
- treatment of mucocutaneous separation,
- etiology of peristomal moisture-associated skin damage, and
- treatment of peristomal skin erythema extending from the stoma.

After completion of the knowledge test, the participant was directed to click on a link to the PowerPoint file and download. The education was entitled *Stomal & Peristomal Assessment & Management: Colostomy Ileostomy Urostomy* by Kim Saunders (see Appendix H) and formatted in a PowerPoint presentation with voice-over for the online group. After watching the education, a second PowerPoint presentation was provided via downloadable link to use as a tool during the post tests. This presentation was entitled *Ostomy Pouching Decisions 101* by Kim Saunders (see Appendix I).

Using the *Ostomy Pouching Decisions 101* tool, the participant took the self-efficacy and knowledge test again. The Qualtrics online platform did not allow the participant to return to pre-education questions to change any answers. Once the

participant completed the post tests, a thank you statement appeared and indicated the completion of the project.

The face-to-face group received their consent form (see Appendix J) at the beginning of the education session. After briefing the attendees on the study, the demographic survey, self-efficacy and knowledge tests were handed out. Both online and face-to-face groups received the same surveys with the only differences of online verses paper format. After signing the consent form, the participants were directed to assign an alias name and three numbers as their identifier for each tool. This alias was known only to the participant and was used on all tools except for the consent form. The attendees were given time to complete the surveys and tests.

After all participants had completed their tests, the forms were collected. The face-to-face groups then received the same education PowerPoint (*Stomal & Peristomal Assessment & Management: Colostomy Ileostomy Urostomy* by Kim Saunders) without voice-over, but with the DNP student teaching live. After the education, the group was given the self-efficacy and knowledge tests using the same PowerPoint tool *Ostomy Pouching Decisions 101.* The participants were reminded to use the same alias used on the pre-education tests. All forms were collected at the end of the education session.

At the end of the project implementation phase, the DNP student entered all face-to-face data into IBM® SPSS Statistics Software online platform using the alias names to group the pre/posttests per participant. The online group's data immediately saved into Qualtrics platform as the participant completed the study. After completion of the 30-day window, all online Qualtrics data was securely transformed to the same IBM® SPSS

Statistics Software. Therefore, the data from all participants was securely analyzed in the same software package.

3.4 SWOT Analysis

a) Strengths. The project included two groups: online and face-to-face education intervention. This is a strength because education delivery methods can be evaluated as to the impact of retention of learning. The clinical tool developed and provided for the intervention has practical application post education intervention. This is a strength as the frontline clinician can use this when assessing patients with an ostomy.

b) Weaknesses. Project weaknesses include the use of convenience samples rather than a random electronic distribution of the project. This decreases generalization to the larger population. Another weakness is the varying levels of expertise among the clinicians. The self-efficacy survey assessed perceptions of knowledge to accommodate for this.

c) Opportunities. Clinical resources currently available to a bedside clinician include evidenced based guidelines for peristomal management. Additional support includes programs for certified ostomy nurses and certified ostomy care associates (Wound Ostomy Continence Nurses Society, 2018). However, a gap exists for a condensed version of education and algorithm tools for the bedside clinician to triage peristomal problems until a certified clinician is available. This project seeks to fill this education gap and evaluate its effectiveness in learning and self-efficacy.

The education implementation provides questions for the frontline clinician to ask when managing stomal and peristomal presentations. The education proceeds with the clinical problem-solving answers for these five questions. These questions include

- what is the size and height of the stoma,
- what is the condition of the peristomal skin,
- what is the effluent and consistency amount,
- are there wounds or body contours to consider, and
- what supply options are available?

d) Threats. Dissemination of the education implementation tools resulted in only a few online questions. Therefore, the user-friendly Qualtrics platform decreased some of the technology threats. Numbers of participation in live-groups was a potential threat but completed with enough numbers for data comparison.

3.5 Project Impact on Practice

The potential impact on practice is consistent with the literature. Emerging themes of impact included improved nurse self-efficacy and knowledge scores post-education. In addition, the tool provided just-in-time resources for the participants for future management of ostomy patients.

An additional future impact involves the reduced cost of ostomy supplies and improved patient outcomes. Bare and colleagues (2017) found improved confidence in the nurse and the patient post ostomy education projects, but also found a decrease in supply cost. The authors surmised the cost savings post education was associated with quicker resolution of stomal and peristomal problems (Bare et al., 2017). During the in-person education sessions, several participants commented on expected cost-savings impact by providing scripted question and answers for the clinicians to complete before precuring free ostomy samples to problem-solve.

CHAPTER 4: Project Findings and Results

In order to bridge the null hypothesis to the project findings, the PICO questions were reviewed. The primary PICO question was: Do clinicians who participate in a structured educational program including the use of a clinical reference tool, report increased knowledge and self-efficacy in peristomal management? The secondary PICO question was: Do clinicians who participate in an online education program as compared to in-person (face-to-face) education program demonstrate a difference in knowledge and self-efficacy scores in peristomal management?

Regarding the PICO question of education intervention with a clinical tool, there were two hypotheses. The first null hypothesis was there is no difference in the pre-score of self-efficacy verses the post score after education intervention. The second null hypothesis was there is no difference in the pre-scores of knowledge verses the post scores after education intervention.

Regarding the PICO question of education style and its effect on learning, there were two hypotheses. The first null hypothesis was there is no difference in the self-efficacy scores of clinicians receiving online education intervention verses in-person education intervention. The second null hypothesis was there is no difference in the knowledge application scores of clinicians receiving online education intervention verses in-person education intervention.

4.1 Statistical Methods

Frequency statistics were run on categorical demographic variables to describe the sample. Skewness and kurtosis statistics were run on continuous knowledge and self-efficacy scores for pre-intervention and post-intervention. If either statistic was above an

absolute value of 2.0, then the assumption of normality was violated. When the assumption of normality was met, then repeated-measures *t*-tests were used to compare the scores. Means and standard deviations were reported for *t*-test analyses.

The online and in-person respondents were compared on their respective rates of change in knowledge and self-efficacy using mixed-effects ANOVA. Box's *M* test was used to check for the assumption of homogeneity of covariance and Levene's test was used to test for the assumption of homogeneity of variance. The interaction effect was analyzed and interpreted using marginal means and 95% confidence intervals. A line graph was produced to show the interaction. All analyses were conducted using SPSS Version 25 (Armonk, NY: IBM Corp.) and statistical significance was assumed at an alpha value of 0.05.

4.2 Demographics of Participants

The demographic survey was comprised of seven elements obtaining information about participant profession, years practicing as a clinician, highest level of education, and clinical area of practice (See Appendix E). The majority of the clinicians were nurses (~80%), with physical therapist (4.6%), nurse practitioner (4.6%), and the remaining accumulative (11.1%) identifying as 'other' or they did not answer this question. Years practicing as a clinician divided amongst the five-year intervals. Almost half of the clinicians had practiced less than 10 years (~45%), slightly more than a quarter had experience for 11-20 years (~27%), with almost a quarter practicing for greater than 20 years (~23%). Of the participants, the majority were undergraduate level of education (~70%) with ~20% graduate level, and the remaining 10% marked as 'other' as shown in Table 1.

Table 1. Profession, Highest Degree, and Years Practicing

Profession		Highest Degree		Years Practicing	
LPN	5.9%	Diploma	2.6%	0-5 yrs.	20.3%
RN	73.9%	Associate Degree	23.5%	6-10 yrs.	24.8%
PT	4.6%	Baccalaureate Degree	42.5%	11-15 yrs.	14.4%
NP	4.6%	Masters--Nursing	12.4%	16-20 yrs.	12.4%
Other	4.6%	Masters--Physical Therapy	0.7%	>20 yrs.	22.9%
		Doctorate	6.5%		
		Other	6.5%		

More than half of the clinicians (52%) currently practiced in environments where the patient was getting 24hr care (hospital 34.6% and post-acute settings 17.0%). Whereas ~36% of the participants worked in a setting where the patient lived at home with only intermittent healthcare assessment (home health/hospice 25.5% or outpatient 11.1%). Other settings (6.5%) and missed (5.2%) data concludes the data demographics of practice setting as shown in Table 2.

Table 2. Number Ostomates Treated and Clinical Area of Practice

# Ostomates in last year		Clinical Area of Practice	
None	12.4%	Hospital	34.6%
0-5 pts.	51.0%	Post-acute	17.0%
6-10 pts.	13.7%	Home Heath or Hospice	25.5%
>10 pts.	17.6%	Outpatient	11.1%
		Other	6.5%

To explore the frequency of exposure to ostomates or past education regarding ostomies, participants were also asked about recall of ostomy education in their academic program and to recall the number of ostomates treated in the past year. Of the frequency of treating ostomates, the majority (~77%) had less than 10 ostomy patients in the last

year, with only 17% treating greater than 10 ostomates as shown in Table 2. Therefore, exposure to an ostomate was less than one patient per month.

Related to the first 'unfreezing' stage of Lewin's change theory, the participants were then asked whether they felt ostomy education would benefit them. Their overwhelming readiness to learn scored greater than 85% as shown in Table 3. This along with pre-education test questions of self-efficacy and knowledge was intended to help the participant self-identify knowledge gaps. In regard to experience and education with ostomates, ~49% did not have or did not recall whether they had ostomy education in their academic program as shown in Table 3.

Table 3. Ostomy Education in Academia and Belief Education Beneficial

Ostomy Education in Academia?		Believes Supplemental Ostomy Education Will Be Beneficial	
Yes	46.4%	Yes	85.6%
No	30.7%	No	2.0%
Don't recall	17.6%	Undecided	3.9%

Thus, half of the clinicians did not recall ostomy education in academia, and two-thirds had infrequent exposure to ostomates averaging less than one per month. This low frequency and low recall of education was despite ~70% of them practicing in either hospitals or home health, which is a common assessment/treatment/teaching environment for ostomates. As a positive reflection of Lewin's 'unfreezing' stage, the participants overwhelmingly agreed (99%) that supplemental education would be helpful. The demographic statistics align with the project purpose and need for developing a clinical reference tool to be utilized during ostomy management, especially when the knowledge is needed infrequently.

4.3 Knowledge and Self-Efficacy in Stomal Management Data

Next the participants knowledge and self-efficacy in assessing and treating stomal and peristomal conditions were measured over time. Self-efficacy data was collected from identical questions administered in the pre- and post-surveys. The scoring utilized a 5-point Likert scale measuring “I strongly agree” through “I strongly disagree”. The questions asked the clinicians’ comfort level in five different areas of ostomy management (See Appendix F).

Knowledge data was collected from identical questions administered in the pre- and post-tests (true/false and multiple choice). Items were scored as correct or incorrect for analysis (See Appendix G). An additional analysis included the appreciation for the answer of ‘I don’t know”. This option was utilized to gain a clearer picture of whether the attendee understood the concept, instead of picking the right answer by chance when forced to choose true or false. The implications of these results will be discussed in Chapter 5.

Prior to evaluating the continuous data scores of knowledge and self-efficacy, the assumption of normality was tested using skewness and kurtosis statistics. Neither statistic was above 2.0, thus the assumption of normality was met as shown in Table 4.

Table 4. Descriptive Statistics for Normality

Descriptive Statistics for Normality

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Pre-Knowledge	141	.4312	.21651	.378	.204	.292	.406
Post-Knowledge	112	.8170	.16489	-1.160	.228	1.443	.453
Pre-Self-Efficacy	146	3.0171	1.16900	-.211	.201	-.967	.399
Post-Self-Efficacy	117	3.7094	1.07192	-.982	.224	.247	.444
Valid N (listwise)	104						

The repeated-measures *t*-tests were used to compare the scores with the means and standard deviations as shown in Table 5.

Table 5. Paired *t*-test per Group, Pre- and Post-Scores

Paired Samples Statistics

		Mean	N	Std. Deviation
Pair 1	Pre-Knowledge	.4402	107	.21799
	Post-Knowledge	.8196	107	.16679
Pair 2	Pre-Self-Efficacy	2.9454	116	1.15966
	Post-Self-Efficacy	3.6997	116	1.07142

Repeated-measures of t-tests were used to see if the entire sample changed across time in the knowledge and self-efficacy surveys as shown in Table 6.

Table 6. 2-tailed *t*-test Showing Change Over Time

Paired Samples Test				
		t	df	Sig. (2-tailed)
Pair 1	Pre-Knowledge – Post Knowledge	-16.030	106	.000
Pair 2	Pre-Self-Efficacy – Post Self-Efficacy	-6.485	115	.000

The time measurement was before and after education intervention, with using the reference tool as a resource in the post-education testing. There was a statistically significant increase in knowledge across time, $p < 0.001$. There also was a statistically significant increase in self-efficacy across time, $p < 0.001$.

4.4 Online versus In-Person Learning Data

Next, the two groups were compared against each other on how they changed pre and post education intervention to evaluate teaching methods and its effect on learning. Comparing the outcomes of knowledge and self-efficacy, a mixed-effects analysis (ANOVA) was used to see if there was a different rate of change in scores across time.

Looking at knowledge outcome first, Box's *M* test tested for the assumption of homogeneity of covariance and Levene's test checked for the assumption of homogeneity of variance. There was a significant difference ($p = 0.007$) between the groups in how they changed across time as shown in Table 7.

Table 7. Tests of Within-Subjects' Effects on Knowledge

Tests of Within-Subjects Effects on Knowledge

Measure: MEASURE_1

Source		df	F	Sig.	Partial Eta Squared	Observed Power[a]
Knowledge * Group	Sphericity Assumed	1	7.544	.007	.067	.777
	Greenhouse-Geisser	1.000	7.544	.007	.067	.777
	Huynh-Feldt	1.000	7.544	.007	.067	.777
	Lower-bound	1.000	7.544	.007	.067	.777
Error(Knowledge)	Sphericity Assumed	105				
	Greenhouse-Geisser	105.000				
	Huynh-Feldt	105.000				
	Lower-bound	105.000				

a. Computed using alpha = .05

The interaction effect was analyzed and interpreted using marginal means and 95% confidence intervals at time points of pre and post education as shown in Table 8. **Table 8. Group Comparison of Knowledge Change Across Time**

Group Comparison of Knowledge Change Across Time

Measure: MEASURE_1

Group	Knowledge	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Online	1	.500	.039	.423	.577
	2	.781	.030	.722	.840
In person	1	.416	.025	.367	.465
	2	.836	.019	.798	.873

It was noted the in-person group knowledge level ranked lower pre-education but then exceeded the online group knowledge level measure post-education. Thus, the in-person

group had a much stronger change across time versus the online group as depicted in the line graph as shown in Figure 1.

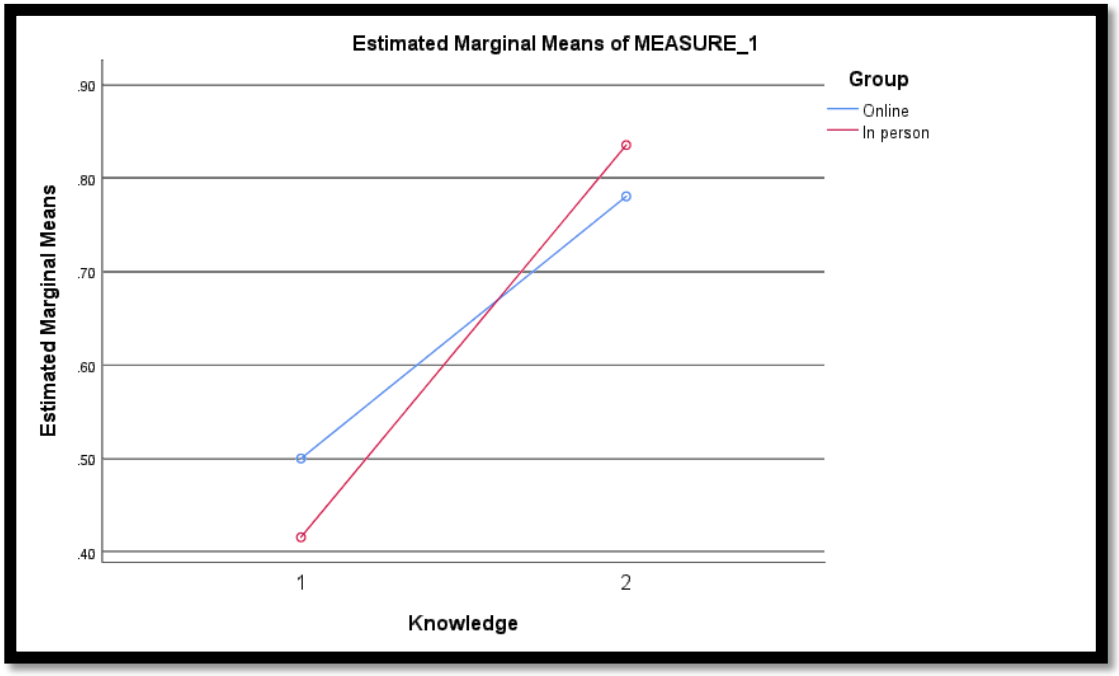


Figure 1. Estimated Marginal Means of Measure: Knowledge of Online vs In-Person Group

With the same process of measuring self-efficacy outcome, the assumption of homogeneity was tested, and normality was met. There was a significant difference ($p = 0.012$) between the groups in how they changed across time as shown in Table 9.

Table 9. Mixed Effect Analysis of Self-Efficacy Within Subjects

Tests of Within-Subjects Effects on Self-Efficacy

Measure: MEASURE_1

Source		df	F	Sig.	Partial Eta Squared	Observed Power[a]
Self-Efficacy	Sphericity Assumed	1	50.180	.000	.306	1.000
	Greenhouse-Geisser	1.000	50.180	.000	.306	1.000
	Huynh-Feldt	1.000	50.180	.000	.306	1.000
	Lower-bound	1.000	50.180	.000	.306	1.000
Self-Efficacy * Group	Sphericity Assumed	1	6.452	.012	.054	.712
	Greenhouse-Geisser	1.000	6.452	.012	.054	.712
	Huynh-Feldt	1.000	6.452	.012	.054	.712
	Lower-bound	1.000	6.452	.012	.054	.712
Error(Self-Efficacy)	Sphericity Assumed	114				
	Greenhouse-Geisser	114.000				
	Huynh-Feldt	114.000				
	Lower-bound	114.000				

a. Computed using alpha = .05

Similarly, the interaction effect was analyzed and interpreted using marginal means and 95% confidence intervals at time points of pre and post education as shown in Table 10.

Table 10. Group Comparison of Self-Efficacy Change Across Time

Group Comparison of Self-Efficacy Change Across Time

Measure: MEASURE_1

Group	SelfEfficacy	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Online	1	3.187	.201	2.789	3.585
	2	4.399	.171	4.061	4.737
In person	1	2.849	.127	2.598	3.100
	2	3.422	.108	3.209	3.635

The in-person group ranked lower in self-efficacy similarly to their lower knowledge scores compared to the online group. However, the post education intervention scores with in-person group did not increase as much and stayed lower than the online group, which is a different effect of the in-person participants in their knowledge score changes over time. Thus, the online group had more change in self-efficacy across time as shown in Figure 2.

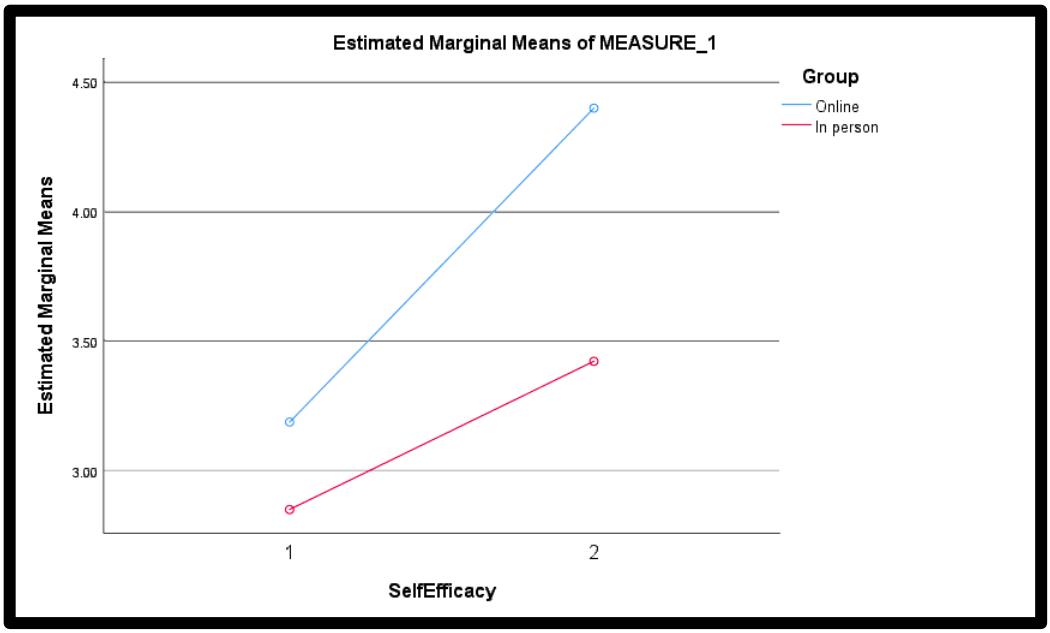


Figure 2. Estimated Marginal Means of Measure: Self-Efficacy of Online vs In-Person Group

CHAPTER 5: Significance and Implications

5.1 Statistical Results

The statistical assumptions for all analyses were tested and met. There was a statistically significant increase in knowledge scores from pre-intervention to post-intervention, $t(106) = -16.03$, $p < 0.001$. Thus, we reject the null hypothesis that there was no difference in the pre/post-scores of knowledge. There was also a statistically significant increase in self-efficacy across time for the total sample, $t(115) = -6.49$, $p < 0.001$. Therefore, we reject null hypothesis that there was no difference in the pre-score of self-efficacy verses the post score after education intervention. The means and standard deviations for the repeated-measures *t*-tests are summarized in Table 11.

Table 11. Summary Descriptive Statistics for Group Comparisons and Interactions

Outcome	Pre-intervention	Post-intervention	*p*-value
Knowledge	44.0 (21.8)	82.0 (16.7)	< 0.001
Self-efficacy	2.9 (1.2)	3.7 (1.1)	< 0.001

The mixed-effects analysis found a significant interaction between the groups on their change in both knowledge, $F(1,105) = 7.54$, $p = 0.007$, $\eta^2 = 0.07$, power = 0.78 (Table 7), and for self-efficacy, $F(1,114) = 6.45$, $p = 0.012$, $\eta^2 = 0.05$, power = 0.71 (Table 9). Thus, we reject both null hypotheses that there was no difference in the self-efficacy nor the knowledge scores of clinicians receiving online education intervention verses in-person education intervention. A summary of the marginal means and 95% confidence intervals are presented in Table 12.

Table 12. Summary Descriptive Statistics for Interactions

Outcome	Group	Pre-intervention	Post-intervention	*p*-value
Knowledge				
	Online	50.0 (42.3 – 57.7)	78.1 (72.2 – 84.0)	
	In person	41.6 (36.7 – 46.5)	83.6 (79.8 – 87.3)	0.007
Self-efficacy				
	Online	3.2 (2.8 – 3.6)	4.4 (4.1 – 4.7)	
	In person	2.8 (2.6 – 3.1)	3.4 (3.2 – 3.6)	0.012

5.2 Implications

Figures depicting the interactions for knowledge and self-efficacy are presented in Figures 3 and 4, respectively. Noted, the in-person group started lower in scores for both knowledge and self-efficacy pre-education compared to the online group. Although both groups significantly increased in both outcomes post-education, the in-person group had a much greater improvement in knowledge, however the online group had a greater improvement in self-efficacy.

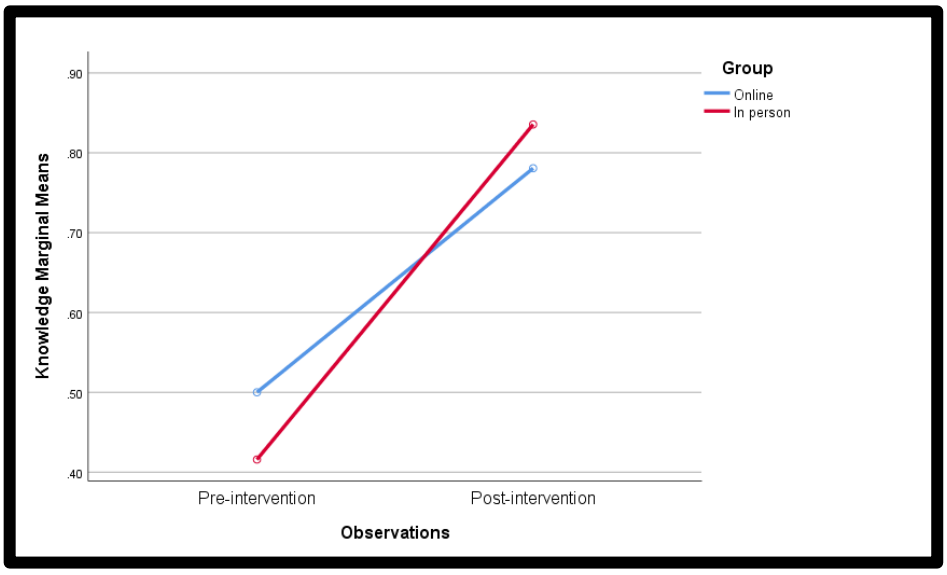


Figure 3. Interaction for Knowledge

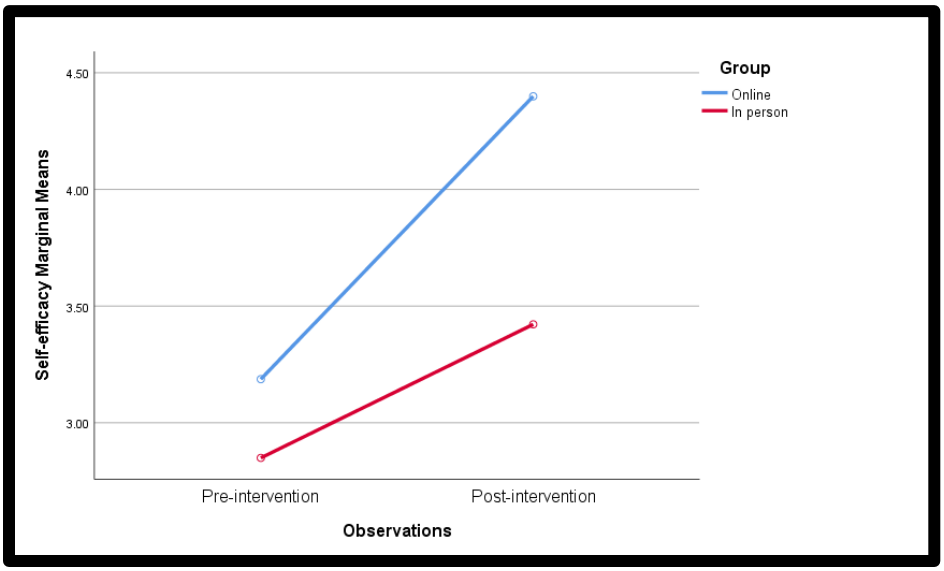
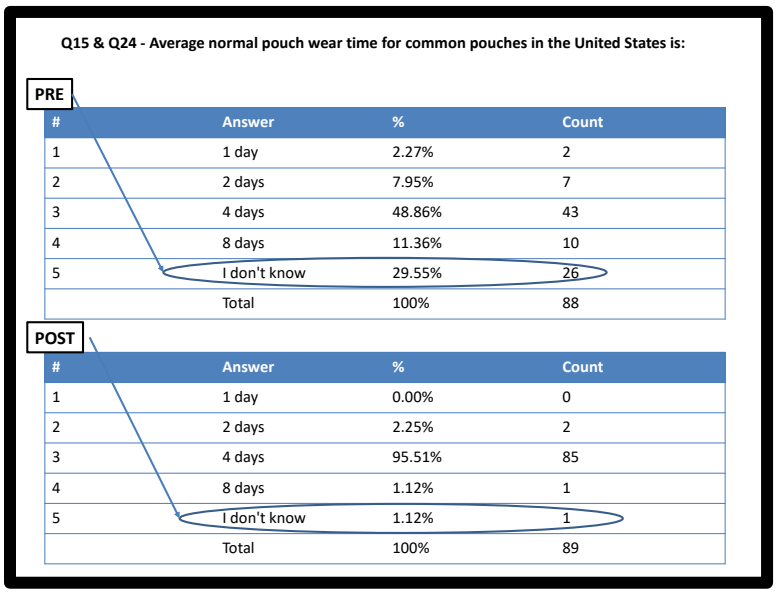


Figure 4. Interaction for Self-Efficacy

The in-person learning proved to be more effective in knowledge growth compared to the online group. The increased knowledge did not parallel however, at the same percentage rate of increase in self-efficacy. The analysis showed the online group's self-efficacy improved at a higher rate even though their knowledge growth didn't increase at the same slope of improvement. Thus, the in-person group's knowledge started lower but finished higher but did not correlate with the same rate of growth in their self-efficacy.

The analysis of the answer 'I don't know' proved to be interesting as an educator and as a specialty clinician. As an educator, when the student was given an option of 'I don't know' without penalty (undesired grade), the percentage of actual knowledge and change of knowledge post education could be appreciated. For a basic question of usual pouch wear time, 29.55% chose 'I don't know' pre-education but dropped to 1.12% post-education as shown in Table 13.

Table 13. Participant Answers for Pouch Wear Time



Q15 & Q24 - Average normal pouch wear time for common pouches in the United States is:

PRE

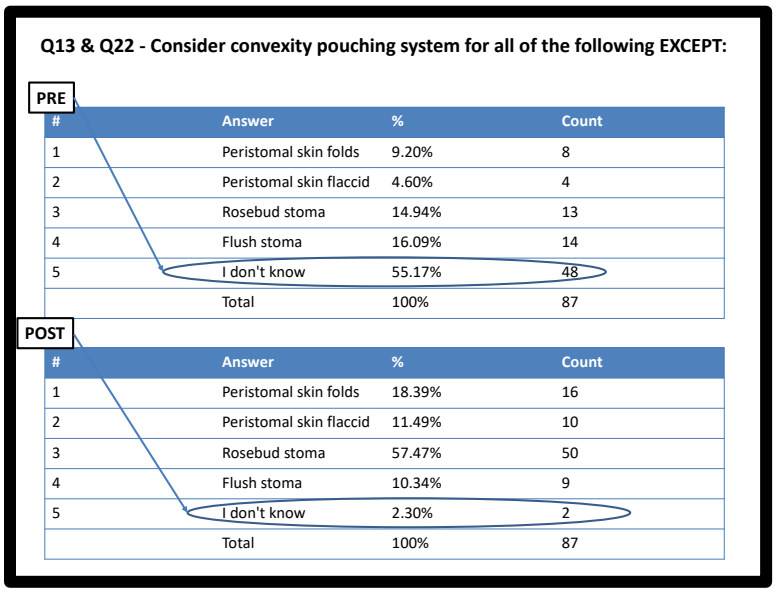
#	Answer	%	Count
1	1 day	2.27%	2
2	2 days	7.95%	7
3	4 days	48.86%	43
4	8 days	11.36%	10
5	I don't know	29.55%	26
	Total	100%	88

POST

#	Answer	%	Count
1	1 day	0.00%	0
2	2 days	2.25%	2
3	4 days	95.51%	85
4	8 days	1.12%	1
5	I don't know	1.12%	1
	Total	100%	89

For more difficult questions of convexity usage, the pre and post changes of 'I don't know' had a much larger change in percentages, decreasing from 55.17% to 2.3% as shown in Table 14.

Table 14. Participant Answers for Convexity Usage



Q13 & Q22 - Consider convexity pouching system for all of the following EXCEPT:

PRE

#	Answer	%	Count
1	Peristomal skin folds	9.20%	8
2	Peristomal skin flaccid	4.60%	4
3	Rosebud stoma	14.94%	13
4	Flush stoma	16.09%	14
5	I don't know	55.17%	48
	Total	100%	87

POST

#	Answer	%	Count
1	Peristomal skin folds	18.39%	16
2	Peristomal skin flaccid	11.49%	10
3	Rosebud stoma	57.47%	50
4	Flush stoma	10.34%	9
5	I don't know	2.30%	2
	Total	100%	87

In regard to the question of stomal prolapse, uncertainty changed greatly as well from 51.69% to 1.14% as shown in Table 15.

Table 15. Participant Answers for Stomal Prolapse Findings

Q14 & Q23 - What is an expected normal finding in treating a patient with a stomal

PRE

#	Answer	%	Count
1	1 piece pouch system with hole cut larger	11.24%	10
2	Urgent surgical revision	19.10%	17
3	Convexity rigid pouching system	8.99%	8
4	Tip of stoma is purple	8.99%	8
5	I don't know	51.69%	46
	Total	100%	89

POST

#	Answer	%	Count
1	1 piece pouch system with hole cut larger	67.05%	59
2	Urgent surgical revision	19.32%	17
3	Convexity rigid pouching system	9.09%	8
4	Tip of stoma is purple	3.41%	3
5	I don't know	1.14%	1
	Total	100%	88

The same results occurred in a series of 5 true/false queries of knowledge with a visual decrease noted in the uncertainty of the learner in various stomal and peristomal scenarios as shown in Figure 5.

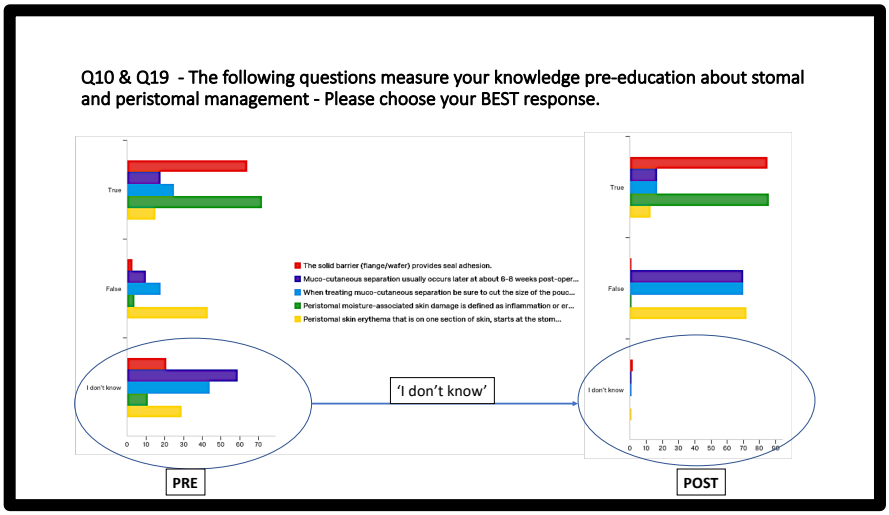


Figure 5. Participant True/False verses I Don't Know

The concern as a specialty clinician was that the frontline clinician uncertainty (I don't know) can result in clinical guessing of the treatment plan rather than treatment

based on proven methodology. As an educator, adding the option of ‘I don’t know’ in knowledge assessment provided an accurate calculation of knowledge deficits.

5.3 Limitations and Summary

The in-person group completed the testing on paper forms while the online group completed testing on the computer. Score differences may have been affected by this. Thus, to mitigate this limitation in future studies, online testing linked via their smart-phones could occur for the in-person group. During the education session, the online test could be accessed by scanning a URL code directly linked to the testing/survey. Accommodations would be necessary for individuals without an electronic device, but otherwise the in-person group would take the test exactly in the manner of the online group.

Testing comprehension with an opt-out answer of ‘I don’t know’ allows for a pure assessment of knowledge deficits. The limitation occurs when there are negative consequences associated with a wrong answer (bad grade). One way to mitigate this limitation in academia is to give partial credit for the answer of ‘I don’t know’. For extra credit after testing, the student could use an open-book philosophy to identify the rationale of why the answer was incorrect and pinpoint the correct answer. This achieves the true goal of knowledge acquisition while correcting for the potential undesired grade.

This doctoral project focused on a teaching methodology and its effect on the learner regarding peristomal assessment and treatment. However, the results have carry-over implications on education techniques and methods of testing knowledge. Online or in-person instruction mutually show improvement in knowledge and self-efficacy of the subject matter. The level of improvement may individually differ according to the

teaching methodology and testing approach. Thus, a varied education and testing style is recommended for best knowledge acquisition and implementation into practice.

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APPENDIX A: PARTICIPANT RECRUITMENT EMAIL ONLINE GROUP

Hello,

This is Kim Saunders, your teacher for a previous wound education event in the spring of 2018. At that event you submitted your email for inclusion in an ostomy online-education event fall of 2018. This ostomy online-education evaluates change in knowledge and self-efficacy post education with using a clinical tool for ostomy assessment. This study is a requirement as I am a student for the Doctor of Nursing Practice Degree (DNP) at the University of North Carolina at Charlotte. This DNP project is being supervised by my clinical chair, Dr. Kathleen Jordan.

Kathleen S. Jordan, DNP, MS, FNP-BC, ENP-BC, ENP-C, SANE-P, FAEN
Clinical Assistant Professor
UNC Charlotte School of Nursing
9201 University City Boulevard
Charlotte, NC 28223
ksjorda1@uncc.edu

Participants will be asked to complete:

1. Pre-test to measure baseline knowledge, self-efficacy, and demographic information (estimated 20 minutes)
2. Online Education Intervention with downloadable clinical tool (estimated 40 minutes)
3. Post-test to measure knowledge and self-efficacy (estimated 10 minutes)

Your participation is valuable as I will use this information to adjust the clinical tool and then make it available for widespread distribution. As a token of my appreciation you will be able to download the tool for free and use in your clinical area for patient assessment, clinician orientation, etc.

You will receive another email within the next two weeks giving you the opportunity to click to a Qualtrics link to take a survey/test and download and watch the education. If you are willing to participate in this study then click on the link and it will direct you to Qualtrics.

You will be asked to consent. If you click yes to the consent question you will be automatically forwarded into the rest of the study and links for the downloadable education. If you click no to consent, then the survey will close without ability to download the education. You will be able to access the education material by link to copy and paste into a separate window. Keep Qualtrics survey open because you will return to it to complete the survey after you watch the education video.

The voice-over education PowerPoint and the pocket guide power point are yours to keep to use as you need in your clinical areas.

Thank you,

Kim Saunders, RN, MSN/ED, CWON, CFCN
Certified Wound Ostomy & Foot/Nail Nurse
DNP Student at University of North Carolina Charlotte
Ksaund14@uncc.edu

APPENDIX B: ONLINE PARTICIPANT REMINDER EMAIL

This is Kim Saunders. You will receive this reminder email weekly x3 to complete your Qualtrics survey and education on peristomal/stomal presentations. To keep your responses anonymous, I don't know who has completed the survey yet or not. Thus, if you have already completed the survey disregard this email.

Thanks again
Kim Saunders

APPENDIX C: PARTICIPANT RECRUITMENT FACE-TO-FACE GROUP

Hello,

This is Kim Saunders, your teacher for this education event today. The education includes an ostomy lecture evaluating change in knowledge and self-efficacy post education using a clinical tool for ostomy assessment. This study is a requirement as I am a student for the Doctor of Nursing Practice Degree at the University of North Carolina at Charlotte. I appreciate your involvement in this study.

Participants will be asked to complete:

1. Pre-test to measure baseline knowledge, self-efficacy, and demographic information (estimated 20 minutes)
2. Live Education Intervention with printed clinical tool (estimated 60 minutes)
3. Post-test to measure knowledge and self-efficacy (estimated 10 minutes)

Your participation is valuable as I will use this information to adjust the clinical tool and then make it available for widespread distribution. As a token of my appreciation you will be able to download the tool electronically for free and use in your clinical area for patient assessment, clinician orientation, etc.

If you are willing to allow your pre/post test scores to be used as part of this study, you will be given hand-written questionnaires and assigned a username and password to keep your responses confidential. If you decide that you do not want your test scores used for the study, you will still receive the education, but will simply keep your questionnaires and consent form and not return these during the course. Regardless of your decision to submit your information for study, I appreciate your involvement in the education and hope the tool is helpful for you in your practice.

Thank you,

Kim Saunders, RN, MSN/ED, CWON, CFCN
Certified Wound Ostomy & Foot/Nail Nurse
DNP Student at University of North Carolina Charlotte
Ksaund14@uncc.edu

APPENDIX D: ONLINE PARTICIPANT CONSENT IN QUALTRICS

Please read the study information in the informed consent below:

An Evaluation of Clinician Knowledge and Self-Efficacy Pre/Post Education in Peristomal Management

Purpose: The primary purpose of this doctoral project is to evaluate the effect of an educational intervention using a clinical reference tool on the participant's knowledge and self-efficacy scores in peristomal management. The secondary purpose is to evaluate the participant's knowledge and self-efficacy based on the delivery method of online education as compared to face-to-face. The objectives of the project are: a) define and teach peristomal best practice guidelines; b) evaluate clinician self-efficacy and knowledge (using a pocket guide tool) pre/post intervention; and c) evaluate correlation of education style with knowledge and self-efficacy.
In order to measure a change in knowledge and self-efficacy, the design of this education program will include a written pretest to be taken before participation in the education program, and a written posttest to be taken upon completion of the program. A demographic data form for you to complete is also included. This educational program will be 60-90 minutes in length.

Project Leader: This study is being conducted by Kim Saunders RN, MSN/ED, CWON who is a certified wound and ostomy nurse working on a doctoral project at the University of North Carolina at Charlotte in the school of Nursing.

Risks and Benefits: This education program is conducted in the hope of increasing the clinician knowledge and self-efficacy in peristomal management. It provides a reference tool for the clinician to use regardless of the clinical setting. This includes pictures of stoma and peristomal presentations.

Voluntary Participation: Your participation in this project in completely voluntary. You may withdraw at any time without any negative consequences.

Conflict of Interest: The investigator has no conflict of interest to report.

Confidentiality: To protect your privacy, numerical coding will be used to match the pre- and post-tests, and the data obtained will be non-identifiable. Results from this project will be recorded as aggregate data.

Informed Consent: I have read the information in this consent form. I have had a chance to ask questions about this study, and those questions have been answered to my satisfaction. Each of these items have been explained to me by the project leader. My signature below indicates that I freely agree to participate in this project.

Yes. I agree to participate. Type in name:

I do not want to participate.

APPENDIX E: DEMOGRAPHIC SURVEY

INSTRUCTIONS:
The following questions collect demographic and professional information. For each question, please select the answer option that BEST describes you:

1. Clinician Profession
    a. Licensed Practical Nurse
    b. Registered Nurse
    c. Physical Therapist
    d. Nurse Practitioner
    e. Physician
    f. Other (Please specify) _____

2. Number of years as a Clinician
    a. 0-5 years
    b. 6-10 years
    c. 11-15 years
    d. 16-20 years
    e. >20 years

3. Highest level of education completed
    a. Diploma
    b. Associated Degree
    c. Baccalaureate Degree
    d. Masters Degree in Nursing
    e. Masters Degree in Physical Therapy
    f. Doctorate (M.D., DNP, PhD, DPT)
    g. Other (please specify) _____

4. Clinical area that you currently practice the most at:
    a. Hospital
    b. Post-acute settings (Rehab, SNF, LTC, etc.)
    c. Home health or hospice
    d. Outpatient setting
    e. Other (please specify) _____

5. Do you recall having education in your academic program regarding peristomal and stomal management?
    a. Yes
    b. No
    c. Do not recall

6. In the past year, how many patients have you cared for that had an ostomy?
    a. None
    b. 0-5

c. 6-10
d. >10

7. Do you believe that supplemental education regarding peristomal management would be of benefit to you?
    a. Yes
    b. No
    c. Undecided

APPENDIX F: SELF-EFFICACY TEST

INSTRUCTIONS:

Please choose your response to the following statement using this scale:

1 – STRONGLY AGREE with the statement
2 – AGREE with the statement
3 – UNCERTAIN – you neither agree or disagree with the statement
4 – DISAGREE with the statement
5 – STRONGLY DISAGREE with the statement

1. I am confident that I have adequate knowledge and skills to provide best-practice care of peristomal presentations.
   1 2 3 4 5

2. I am confident in my ability to identify stomal and peristomal complications.
   1 2 3 4 5

3. I am confident in my ability to treat peristomal skin breakdown.
   1 2 3 4 5

4. I am confident in my ability to determine what ostomy supplies to order for a patient's stoma.
   1 2 3 4 5

5. I am confident in my ability to measure a stoma and correctly cut/mold/size the flange to the stoma.
   1 2 3 4 5

6. I am confident in my ability to determine what to do when a pouch keeps leaking.
   1 2 3 4 5

APPENDIX G: KNOWLEDGE TEST

INSTRUCTIONS: The following questions measure your knowledge about stomal and peristomal management. Please choose your BEST response to the following questions:

1. Pick the answer that is NOT true. Pouches come in the following presentations:
    a. 1 or 2 piece
    b. Drainable or closed
    c. Reversible
    d. With valve, velcro, or clamp
    e. I don't know

2. Consider convexity pouching system for all of the following EXCEPT:
    a. Peristomal skin folds
    b. Peristomal skin flaccid
    c. Rosebud stoma
    d. Flush stoma
    e. I don't know

3. What is the BEST answer to treat peristomal skin erythema that occurs at the outer edges of the pouching system only:
    a. Flat pouching system
    b. Topical antifungal powder
    c. Tapeless pouching system
    d. Convexity pouching system
    e. I don't know

4. What is an expected normal finding in treating a patient with a stomal prolapse:
    a. 1 piece pouch system with hole cut larger
    b. Urgent surgical revision
    c. Convexity rigid pouching system
    d. Tip of stoma is purple
    e. I don't know

5. Average normal pouch wear time for common pouches in the United States is:
    a. 1 day
    b. 2 days
    c. 4 days
    d. 8 days
    e. I don't know

6. The solid barrier (flange/wafer) provides seal adhesion.
    a. True
    b. False
    c. I don't know

7. Mucocutaneous separation usually occurs later at about 6-8 weeks post-operatively.
    a. True
    b. False
    c. I don't know

8. When treating mucocutaneous separation be sure to cut the size of the pouch's barrier bigger than the stoma to allow for daily treatment of the stomal tissue detachment from the skin.
    a. True
    b. False
    c. I don't know

9. Peristomal moisture-associated skin damage is defined as inflammation or erosions on the skin around a stoma due to urine/stool exposure.
    a. True
    b. False
    c. I don't know

10. Peristomal skin erythema that is on one section of skin, starts at the stoma, and extends outward toward edge of pouch is usually a sign of infection and needs antibiotics.
    a. True
    b. False
    c. I don't know

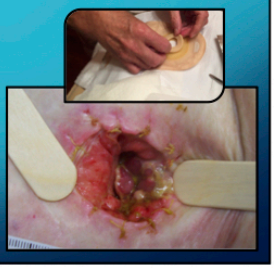
APPENDIX H: STOMAL & PERISTOMAL ASSESSMENT & MANAGEMENT

POUCHING OPTIONS

RETRACTED STOMA

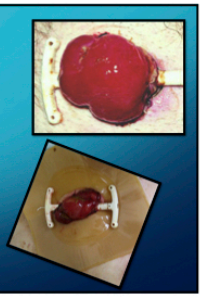
GOAL: NO LEAKING UNDER FLANGE

- Surgeon evaluation if early post-op
- Will need convexity to help stoma present to skin level
- If in skin fold, need flexible convexity (not rigid 2 piece; barrier ring instead)
- If continued leakage—refer to ostomy nurse



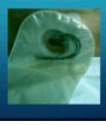
FECAL DIVERSION LOOP STOMA WITH TEMPORARY ROD/TUBE

- Rod removed POD 5-21 (depending on patient presentation)
- If you place flange on top of rod will be uneven & leak
- **OPTIONS:**
  - Cut flange around rod
  - Surgeon remove sutures & place flange under rod
  - If skin erosions after rod removed
    - Ostomy powder, alginate, or hydrocolloid
    - Refer to ostomy nurse if no improvement

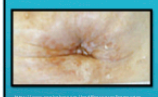


URINARY STOMA WITH TEMPORARY STENTS

- Stents migrate out or surgeon removes ~POD 5-14
- Place stents in pouch until removed



REFERRAL NEEDED (SURGEON/OSTOMY NURSE) FOR THESE LATE COMPICATIONS OF THE STOMA:



STOMAL STENOSIS

- Narrowing of stomal tissue at skin level
- Causes impairment of stool/urine drainage
- Pain with ribbon stool

STOMAL PROLAPSE

- Intestine telescoping through stoma
- Medical management after surgeon evaluation
- Flexible pouch to accommodate stoma size

STOMAL HERNIA

- Intestine bulging into parastomal area
- Flexible pouch
- Refer to ostomy nurse for ostomy belt
- Place belt while supine position (decrease abdominal pressure)

POUCHING QUESTION #2:
What is the condition of the peristomal skin?

Goal is intact skin!

PERISTOMAL MUCOCUTANEOUS SEPARATION

- Separation of the stoma from skin
- See day 3-5 post-op
- Erythema and induration precedes
- Nutritional support
- Complete separation can lead to retraction of stoma
- TREATMENT:
  - Fill wound with powder/alginate
  - Cut flange snug to stoma


PERISTOMAL MOISTURE-ASSOCIATED SKIN DAMAGE (MASD)
• Inflammation/erosion of peristomal skin
• Due to exposure to urine/stool
• Begins at stoma & extends outward
• TREATMENT: MODIFY POUCHING
• Cut/mold flange 1/8" bigger than stoma in exact shape (oval or round)
• Add convexity if flat/recessed stoma
• Consider flexible pouch if skin folds (rigid 2 piece in skin fold pops up)
• TREATMENT IF WEEPING SKIN:
• Stoma powder then skin prep over powder before pouching
PERISTOMAL FUNGAL/CANDIDIASIS INFECTION
• Moisture etiology
• Opportunistic secondary complication of candida albicans
• Erythema rash with pustules; pruritis
• Satellite lesions & maceration
• TREATMENT:
• Better seal of pouch
• Antifungal powder dusting, then seal with skin barrier wipe until resolved
PERISTOMAL ALLERGIC CONTACT DERMATITIS
• Erythema with blisters
• Mirrors the skin contact with flange (allergen)
• TREATMENT:
• Stop all lotions/soaps peristomal
• Skin prep area
• Change to tapeless flange
• REFER TO OSTOMY NURSE IF SEVERE
• Topical steroid spray 1st
• Dermatology patch testing
PERISTOMAL MECHANICAL SKIN DAMAGE: MEDICAL ADHESIVE RELATED SKIN INJURY (MARSI)
• LOCATED:
• Under adhesive; away from stoma
• Often painful (stripping of dermis)
• TREATMENT:
1. Tapeless flange (if tape stripping)
2. Add silicone adhesive remover wipe with removal if tapeless flange doesn't resolve
3. Add skin prep if steps 1 & 2 don't resolve
4. Crust with powder & prep if drainage
PERISTOMAL MECHANICAL SKIN DAMAGE: MEDICAL DEVICE-RELATED PRESSURE INJURY (MDRPI)
• Pressing against skin causing ischemia
• Consider body contours vs. rigid product
• CAUSES:
• Firm product or firm edges; rigid convexity
• PRESENTATION:
• Partial or full thickness damage
• Pain, wound drainage
• TREATMENT:
• Treat wound (powder, alginate, polyurethane circular foam)
• Flexible non-rigid pouch
• Frequency change according to wound drainage
PERISTOMAL FOLLICULITIS
• Inflammation of hair follicles
• CAUSES:
• Shaving, friction, traumatic pouch removal
• PRESENTATION:
• Red pustule around hair follicle
• Crusts, pain, itching common
• TREATMENT:
• Antibacterial skin cleanser peristomal
• Topical antibiotic powder if severe
• Reduce frequency of shaver/clipper
• Consider tapeless
• If irritation under tape only
• Hairy abdomens more at risk

REFER OUT TO OSTOMY NURSE FOR COMPLICATED PERISTOMAL PRESENTATIONS:

PERISTOMAL VARICES (CAPUT MEDUSA)

- Portal hypertension in liver cirrhosis & sclerosing cholangitis
- Peristomal skin purple, dilated tortuous veins
- Less aggressive flange adhesive, skin preps, adhesive removal wipes

PYODERMA GANGRENOSUM (PG)

- Raised pustules erupt to ulcers
- Purple irregular edges, painful, progress rapidly, heavily draining
- Treat underlying Crohn's, UC, arthritis, or hematologic disorder
- Powder, alginate, or *Hydrofera Blue* ring to wound

POUCHING QUESTION #3:
What is the effluent consistency & amount?

Bristol Stool Scale[2,3]

Type 7	Watery, no solid pieces. Entirely liquid.	
Type 6	Fluffy pieces with ragged edges, a mushy stool	
Type 5	Soft blobs with clear-cut edges (passed easily)	
Type 4	Like a sausage or snake, smooth and soft	
Type 3	Like a sausage but with cracks on surface	
Type 2	Sausage-shaped but lumpy	
Type 1	Separate hard lumps, like nuts (hard to pass)	

livethesmartway.com

COLOSTOMY EFFLUENT

- Peristalsis resumes post-op day 3-5
- Gas, then liquid, then more formed
- Soft to well-formed
  - 600-1000ml/day
- Ascending (right side):
  - oatmeal consistency
- Transverse:
  - pasty to semi-solid
- Descending (left side):
  - semi-solid to formed

ILEOSTOMY EFFLUENT

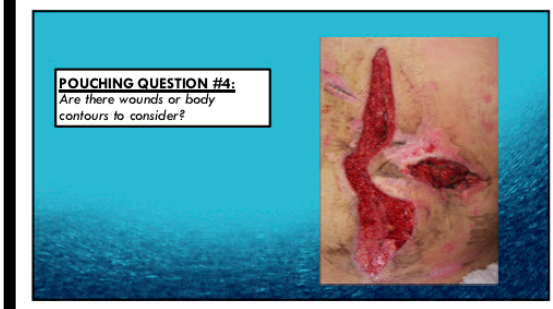
- Peristalsis resumes 12-24 hrs.
- ~500-1000cc/day output
- Thick liquid to semi-pasty (oatmeal)
- >1200cc/day risk dehydration
  - Thirst, muscle cramps, lethargy, decreased urine output
  - 40% readmissions due to dehydration
  - High output ileostomy pouch

ILEOSTOMY EFFLUENT: FOOD/BOLUS BLOCKAGE

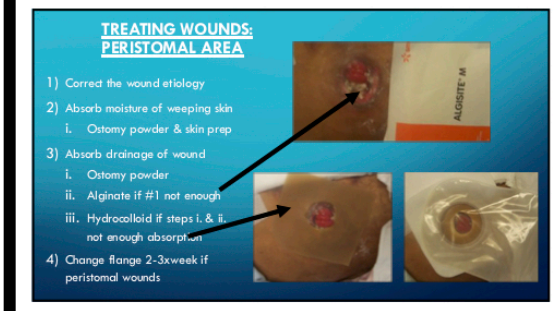
- **Food blockage**
  - Watery output or no output
  - N/V, abdominal distention, cramping
  - Stomal edema
- **TREATMENT FOOD BLOCKAGE**
  - Change pouch & cut hole larger (stomal edema)
  - Warm stoma compress or warm tub bath
  - Go to Emergency Center if:
    - Severe cramping 2-3hrs.
    - Severe watery discharge 5-6 hrs.
    - No output 4-6 hrs.
  - Emergency center LAVAGE by surgeon/Ostomy nurse
    - 14-16 Fr soft catheter stomal lavage with 30-50cc NS, wait for return, repeat until resolved

UROSTOMY EFFLUENT

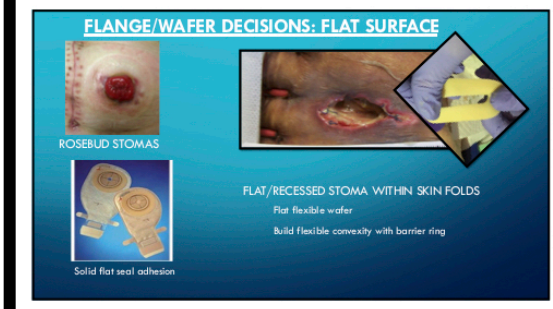
- Output immediately
- Stents protect anastomosis; Left 5-14 POD days
- Put stents in pouch
- Blood-tinged urine expected post-op
- Keep urine acidic
  - Unsweetened cranberry juice qd
- Mucous strands normal; may decrease over time
- Minimum 800ml/24hrs
- Night drainage bag qhs recommended


POUCHING QUESTION #4:
Are there wounds or body contours to consider?


ABDOMINAL CONTOURS: STOMAS & SKIN FOLDS
Nothing rigid in skin folds----it pops up
Flexible 1 or 2 piece
If flush stoma—flexible convexity
barrier ring
flexible convexity flange
Consider tapeless flange
Tape & wet skin folds trap moisture
Consider ostomy belt


TREATING WOUNDS: PERISTOMAL AREA
1) Correct the wound etiology
2) Absorb moisture of weeping skin
i. Ostomy powder & skin prep
3) Absorb drainage of wound
i. Ostomy powder
ii. Alginate if #1 not enough
iii. Hydrocolloid if steps i. & ii. not enough absorption
4) Change flange 2-3xweek if peristomal wounds
ALGISITE M


POUCHING QUESTION #5:
What supply options are available?
BARRIER RING
1 PIECE URINE
CONVEXITY
2 PIECE FLANGE
CAULKING PASTE
SKIN PREP
1 PIECE FECAL
POWDER
2 PIECE POUCH


FLANGE/WAFER DECISIONS: FLAT SURFACE
ROSEBUD STOMAS
Solid flat seal adhesion
FLAT/RECESSED STOMA WITHIN SKIN FOLDS
Flat flexible wafer
Build flexible convexity with barrier ring


FLANGE/WAFER DECISIONS: CONVEXITY SURFACE
SOFT CONVEXITY
Flat stoma
Soft abdomen
RIGID CONVEXITY
Recessed stoma
Soft abdomen without significant skin folds
BUILD YOUR OWN CONVEXITY
Flat or recessed stoma
Rigid/robust abdomen
Hernia presentation
Flat wafer & moldable barrier ring

1 PIECE POUCH
(FLANGE & POUCH ALREADY TOGETHER)
BIGGEST ASSET IS FLEXIBILITY


2 PIECE POUCH: FLANGE & POUCH SEPARATE

Allows Options For Application Or Removal Of Pouch To Empty Without Removing Flange

1. APPLY FLANGE TO SKIN
2. SNAP POUCH ON

1. SNAP POUCH/FLANGE TOGETHER
2. THEN PLACE ON SKIN




ASSESORIES

SKIN BARRIER PASTE

In a tube

Caulking around stoma enhances seal

SKIN BARRIER RING/STRIP

Adhesive washer or strip placed peristomal

Moldable, cut, pre-shaped options

LIQUID SKIN BARRIER (SKIN PREP)

Acrylate copolymer or cyanoacrylate clear film

Apply to Peristomal skin

Protects from effluent, MARSI, or seals powder

ASSESSORIES

ADHESIVE REMOVERS

USES:

- Pain with flange removal
- Fragile/frail skin

Wipes, sprays, liquids

Silicone options do not require cleansing afterwards

BELTS

Requires pouch with loops on side

Applies pressure to enhance seal



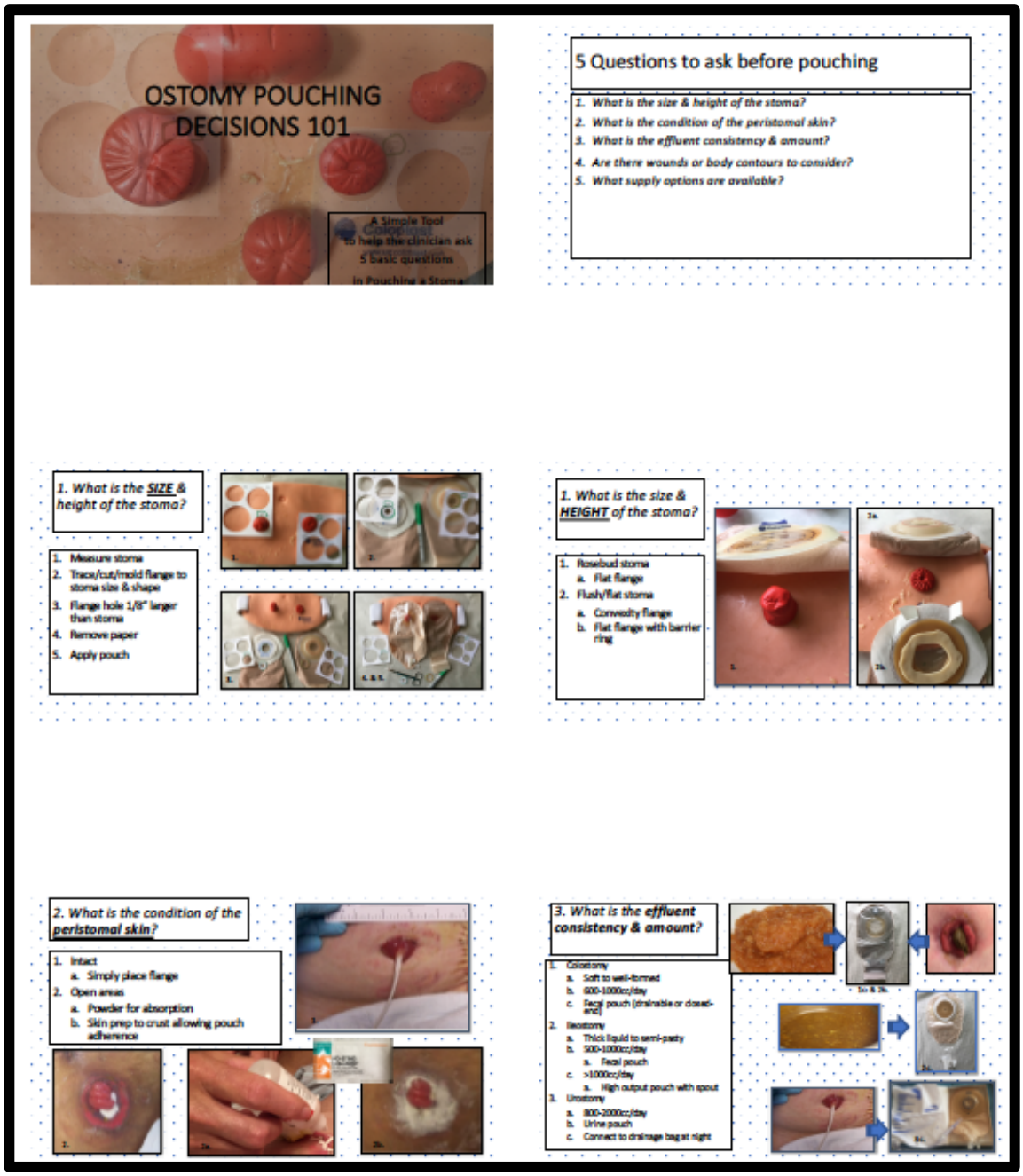
ELASTIC SKIN BARRIER STRIP

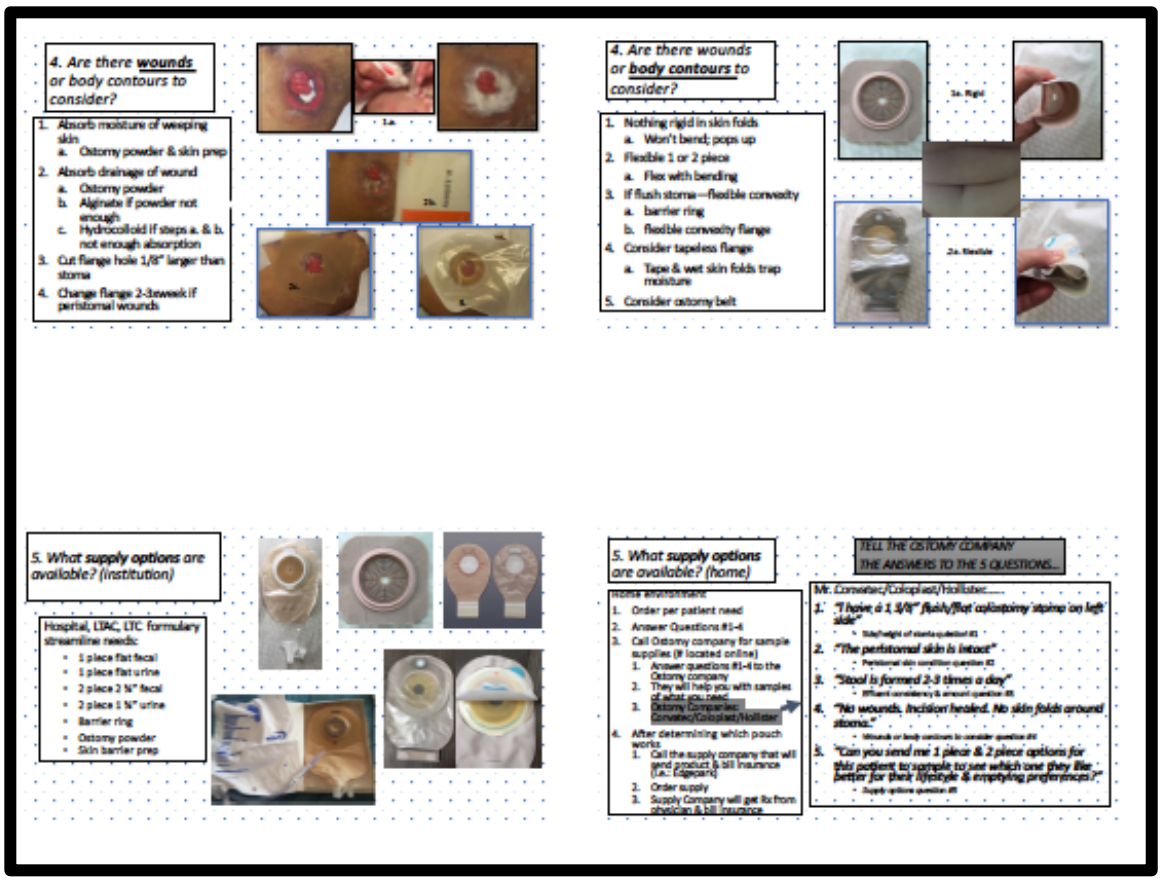
Thin hydrocolloid placed on top of flange outer edge

Replaces patient adding irritating tape to secure

Stretches with body contours & movement

APPENDIX I: OSTOMY POUCHING DECISIONS 101




4. Are there wounds or body contours to consider?
1. Absorb moisture of weeping skin
a. Ostomy powder & skin prep
2. Absorb drainage of wound
a. Ostomy powder
b. Alginate if powder not enough
c. Hydrocolloid if steps a. & b. not enough absorption
3. Cut flange hole 1/8" larger than stoma
4. Change flange 2-3xweek if peristomal wounds
1a.
2a.
3a.
4. Are there wounds or body contours to consider?
1. Nothing rigid in skin folds
a. Won't bend; pops up
2. Flexible 1 or 2 piece
a. Flex with bending
3. If flush stoma—flexible convexity
a. barrier ring
b. flexible convexity flange
4. Consider tapeless flange
a. Tape & wet skin folds trap moisture
5. Consider ostomy belt
1a. Rigid
2a. Flexible
5. What supply options are available? (institution)
Hospital, LTAC, LTC formulary streamline needs:
1 piece flat fecal
1 piece flat urine
2 piece 2 ¾" fecal
2 piece 1 ¾" urine
Barrier ring
Ostomy powder
Skin barrier prep
5. What supply options are available? (home)
Home administrator
1. Order per patient need
2. Answer Questions #1-4
3. Call Ostomy company for sample supplies (if located online)
1. Answer questions #1-4 to the Ostomy company
2. They will help you with samples of what you need
3. Ostomy Companies: Convatec/Coloplast/Hollister
4. After determining which pouch works
1. Call the supply company that will send product & bill insurance (i.e., Edgecare)
2. Order supply
3. Supply Company will get Rx from physician & bill insurance
TELL THE OSTOMY COMPANY THE ANSWERS TO THE 5 QUESTIONS...
Mr. Convatec/Coloplast/Hollister....
1. "I have a 1 3/8" flush/flat colostomy stoma on left side"
2. "The peristomal skin is intact"
3. "Stool is formed 2-3 times a day"
4. "No wounds. Incision healed. No skin folds around stoma."
5. "Can you send me 1 piece & 2 piece options for this patient to sample to see which one they like better for their lifestyle & emptying preferences?"

APPENDIX J: FACE-TO-FACE GROUP INFORMED CONSENT

An Evaluation of Clinician Knowledge and Self-Efficacy
Pre/Post Education in Peristomal Management

Purpose: The primary purpose of this doctoral project is to evaluate the effect of an educational intervention using a clinical reference tool on the participant's knowledge and self-efficacy scores in peristomal management. The secondary purpose is to evaluate the participant's knowledge and self-efficacy based on the delivery method of online education as compared to face-to-face. The objectives of the project are: a) define and teach peristomal best practice guidelines; b) evaluate clinician self-efficacy and knowledge (using a pocket guide tool) pre/post intervention; and c) evaluate correlation of education style with knowledge and self-efficacy.
In order to measure a change in knowledge and self-efficacy, the design of this education program will include a pretest to be taken before participation in the education program, and a posttest to be taken upon completion of the program. A demographic data form for you to complete is also included. This educational program will be 1-2 hours in length if you are taking it online. It will be incorporated within your learning session if you are taking it as a live course.

Project Leader: This study is being conducted by Kim Saunders RN, MSN/ED, CWON who is a certified wound and ostomy nurse working on a doctoral project at the University of North Carolina at Charlotte in the school of Nursing. This DNP project is being supervised by my clinical chair, Dr. Kathleen Jordan.

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Risks and Benefits: This education program is conducted in the hope of increasing the clinician knowledge/self-efficacy in peristomal management. It provides a reference tool for the clinician. This includes pictures of stoma/peristomal presentations. There are no known risks.

Voluntary Participation: Your participation in this project in completely voluntary. If you are online, you may withdraw at any time and your data will not be used. In the live sessions, you may withdrawal by choosing not to submit your survey/test for research after you receive the education.

Conflict of Interest: The investigator has no conflict of interest to report.

Confidentiality: To protect your privacy, numerical coding will be used to match the pre/post tests. The data obtained will be stored online in a non-identifiable, secure format, and recorded as aggregate data.

Informed Consent: I, _____,
(Please print/type your name)
have read the information in this consent form. I have had a chance to ask questions about this study, and those questions have been answered to my satisfaction. Each of these items have been explained to me by the project leader. My signature below indicates that I freely agree to participate in this project.

_____ _____
(Written Signature/Online type name as electronic signature and submit) *(Date)*

Kim Saunders Project Leader September 2018