Abstract of the dissertation entitled

An evidence-based guideline of using abdominal massage to prevent constipation in patients after having hip surgery

Submitted by

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Background

Constipation refers to difficult and incomplete defecation over a prolonged period of time, which is a prevalent health condition affecting individuals at both genders at any ages. It is also a worldwide health issue; around 2% to 29.5% of western population suffered from constipation and its complications. In Hong Kong, up to 14% of the Chinese adults are suffering from different levels of constipation, as revealed by a population-based telephone survey. The problem is even more serious in hospital settings that patients with hip fracture are highly susceptible to constipation (with incidence rate up to 71.7%). Constipation affects patients’ daily activities as well as their life quality. The increased risk of postoperative complications due to constipation also leads to longer hospitalization, greater stress on healthcare professionals, and accounts for large economic burden to society every year.
There are numerous ways to manage constipation, while the most common one is to use laxative owing to its relatively quick response. As there is growing concern over the drawback of laxative use in management of constipation, the practice of abdominal massage is more widely accepted and become more appealing to the affected individuals. There are available evidences to show that abdominal massage is useful in the treatment of chronic constipation. However, there is neither existing systematic review nor local nursing guideline to support the translation of research evidences into practice for application of abdominal massage to relieve constipation, meaning that it is necessary to develop an evidence-based guideline that will inform health care professionals of the management of constipation based on the best available evidences.

**Purposes**

This paper aims to conduct a systematic review to evaluate the existing evidences, to formulate an evidence-based guideline of applying abdominal massage in prevention of constipation in target settings, assess the implementation potential in terms of transferability and feasibility, and finally to develop an implementation strategy and evaluation plan for the guideline.

**Methods**

Four renowned electronic databases: CINAHL Plus (EBSCOhost), Medline (EBSCOhost), British nursing index (ProQuest) and Database from Hospital Authority named eKG (Ovid) were used for electronic searching. Five randomized controlled trials were identified according to the inclusion and exclusion criteria of this dissertation. Data were extracted and the quality and validity of the included studies was evaluated by the qualified appraisal tool: the Scottish Intercollegiate
Guidelines Network (SIGN). All the five studies were graded as high quality and indicated that abdominal massage is statistically significant in alleviation of constipation.

Afterward a systematic review was conducted; the best available evidence was identified in order to develop the proposed guideline. The implementation potential of the proposed massage therapy in terms of target audience and setting, transferability, feasibility and cost-benefit ratio was assessed. An evidence-based guideline of using abdominal massage to prevent constipation in patients after having hip surgery was then developed. An implementation plan was formulated; communication with stakeholders, conduction of a one-month pilot test to determine the feasibility of the innovation, and an evaluation plan to evaluate the effectiveness of the proposed guideline were included.

Results

An evidence-based guideline with regard to the application of abdominal massage to prevent constipation was developed; the proposed innovation appeared as feasible to be applied in the target setting based on the findings of the pilot test, and the results were further analyzed to provide recommendations for refinement of the proposed innovation and hence, facilitate the changing process. The examination of resources, staff acceptability and compliance, as well as the potential benefits to target population, frontline staff and the health care system were performed during the evaluation process with the use of questionnaires. The potential benefit of implementation outweighed its cost as shown in the cost-benefit estimation.
Conclusion

With the application of abdominal massage in patients after having hip surgery, it is expected that constipation and its associated complications can be minimized so that patients can enjoy a better quality of life. In view of nursing staff, the stress for handling constipation can be reduced whereas nurses can possess a higher level of autonomy and job satisfaction; the health cost can be reduced as fewer resources are required to spend on managing constipation and its complications.
An evidence-based guideline of using abdominal massage to prevent constipation in patients after having hip surgery

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A dissertation submitted in partial fulfillment of the requirements for the degree of Master of Nursing at The University of Hong Kong

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Declaration

I declare that this dissertation represents my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report submitted to this university or to any other institution for a degree, diploma or other qualifications.

Signed: .............................................................

Chan Ka Man
July 2016
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Abbreviations

COS  Chief of Service
DOM  Department Operational Manager
EBP  Evidence-based practice
HA   Hospital Authority
HRQoL  Health-related quality of life
NS   Nurse Specialist
O&T  Orthopedics and Traumatology
QoL  Quality of life
RCT  Randomized controlled trial
RN   Registered Nurse
SIGN Scottish Intercollegiate Guidelines Network
SPSS Statistical Package for Social Science
TOE  Table of evidence
VAS  Visual analogue scale
WM   Ward Manager
CHAPTER 1

INTRODUCTION

1.1 Background

Excretion, being one of the seven characteristics of living things, is the ability of an organism to get rid of the solid or liquid waste matter from the body (Oxford Advanced Learner’s English-Chinese Dictionary, 1994, p.499). All living things need to remove waste from their bodies for their survival; if this waste remains in the body it could be poisonous. In mammals, the solid product of undigested food is called feces, where the process of removing feces out of the digestive tract is known as defecation (Defecation, 2015). Defecation is caused by series of muscular contractions called peristalsis in the walls of the colon to push the feces toward the rectum. In humans, defecation commonly takes place in one to two days, while the frequency varies from individual to individual.

Nevertheless, incomplete and difficult elimination of feces may occur, i.e. a condition regarded as constipation (Connor, Hunt, Lindley & Adams, 2014). According to Gary’s study in 2014, constipation refers to “difficulty during defecation and infrequent bowel movements over a prolonged period of time”, where it affects individuals at both genders at any ages. Common risk factors for constipation include inadequate fluid and fiber intake, limited physical exercise, advancing age and a sedentary occupation (Causes of Constipation, 2014). In order to diagnose constipation, medical history taking and physical examination are necessary. Patients have to provide information about diet, medication history, level of physical activity and bowel status including onset of symptoms, frequency of bowel movements,
consistency of stools, presence of blood in the stool and bowel habit. On the other hand, physical examination may include digital rectal exam by using a lubricated, gloved finger to evaluate the tone of the anal sphincter to detect tenderness, fecal impaction, or presence of blood (Diagnosing constipation, 2014).

As a matter of fact, constipation is a highly prevalent health problem, accounting for a large proportion of complaints of gastrointestinal symptoms such as bloating, abdominal cramps, nausea, decreased appetite and generalized discomfort (Noiesen et al., 2013). Despite the life threatening complications being rare, chronic and unmanaged constipation can lead to severe health outcomes such as intestinal obstruction, anal fissure and incontinence (Noiesen et al., 2013); it also results in psychological distress and anxiety to individuals that affect their social well-beings and hence, decrease the quality of life (Doreen, Suzanne, Stanley & Andrea, 2013). The management also accounts for a large economic burden to society every year (La¨ma° s, Lindholm, Engstro´m & Jacobsson, 2010).

In western countries, 2% to 29.5% of population suffered from constipation and its associated complications (La¨ma° s, Lindholm, Engstro´m & Jacobsson, 2010). The same study also revealed that 50-75% of nursing home residents in Finland and the America were diagnosed of constipation with routine usage of laxatives, while up to 11% of elderly receiving home care also suffered from constipation, implying that it could be a fundamental care problem. In addition, evidences showed that constipation affects more in women than men, and its prevalence increases with age, particularly more severe in adults aged over 65 (Gary, 2014). Constipation, yet being unpleasant and often recurrent, can be prevented or managed in various ways such as adequate consumption of fluid and fiber, physical activities, manual evacuation,
digital stimulation and regular use of laxatives (Lamaé s, Lindholm, Engstro¨m & Jacobsson, 2010). In this way, nurses have an important role in managing constipation of the patients, particularly by carrying clinical examination and history taking to rule out the underlying causes (Gary, 2014), and conducting research studies to generate evidences to improve the current practices.

1.2 Affirming the needs

In the past decade of years, the provision of health care is mainly based on tradition, expert opinion or health care providers’ preference. With regard to the growing demand and expectation of quality service, the complexity in nursing practice increases too and nurses assume a higher level of workload, responsibility, and initiative for patient outcome (Lopez, 2003). These give rise to the surge of studies regarding various research problems aimed at providing better patient service, known as evidence-based practice (EBP). Nowadays, evidence-based practice implies application of the best available research findings to determine the choice of healthcare (Carlson, 2015). By reviewing and utilizing up-to-date research findings, best available empirical evidence can be identified and applied to clinical practice. Therefore, it is significant to develop an evidence-based protocol or guideline in clinical setting, as EBP can aid clinical decision-making, optimize patient outcomes and provide cost-effective high quality care (Taylor, 1998). As a nurse, it is also important to be more sensitive to new research and technology; nurse should take an active role in evoking changes and implementing evidence-based recommendations to improve the current nursing practice through clinical observation, research and literature review.
In Hong Kong, a population-based telephone survey revealed that 14% of the Chinese adults suffering from different levels of constipation based on the Rome II criteria (Chan et al., 2004). As a matter of fact, the problem of constipation is even more prevalent and serious in hospital settings, with 79% has been reported, according to Trads and Pedersen’s study (2015). However, there are always misconceptions about facts and management of constipation. Being an overlooked aspect of patient care, constipation is always considered as a boring subject which is self-limiting and not requiring prompt management (Gary, 2014), indicating that it is high time to develop an evidence-based guideline to manage constipation in clinical setting.

I consider the target setting as Department of Orthopedic and Traumatology (O&T) in one of the acute and busy hospitals in Hong Kong. As a nurse working there for three years, I noticed that constipation is especially prevalent among patients undergone surgery. Such an observation is consistent with the findings of a research study conducted by Trads and Pedersen in 2015, in which the incidence rate of constipation in patients with hip fracture was up to 71.7%. The same study also suggested that constipation increased the risk of postoperative complications that could increase individual suffering and the staff workload. The management for constipation also accounts for a large economic burden to society every year (La¨ma°s, Lindholm, Engstro´m & Jacobsson, 2010).

Considering the department I am working in, the annual admission rate is quite steady that is around 1600 cases every year. Based on my clinical observation, up to 40% are those with indication for hip surgery. As discussed by Trads and Pedersen (2015), this group of patients is more susceptible to constipation owing to a lot of risk factors including:
1. Adverse effect of medication: Tramadol (a potent drug commonly used for pain relief after surgery), is a kind of opioid medication that will induce constipation (Webster, 2015).

2. Environmental factor: Staying in an unfamiliar place for a prolonged period (from pre-operation to rehabilitation phase) will lead to change in defecation pattern; for instance a pre-morbid ambulatory patient may find it difficult to defecate into a bedpan or commode at bedside.

3. Inadequate fluid and fiber intake: patients are required to keep fasting before the surgery whereas even diet is resumed postoperatively, their intake and appetite tends to be fair to poor.

4. Physical immobilization inhibits the peristalsis of intestines.

There are numerous strategies to manage constipation, whereas use of laxatives is most widespread and is regarded as effective with quick response. However, long term use of laxatives could result in harmful side effects such as fecal impaction and reduced sensitivity to the drugs that gain little or no effect (Gary, 2014). The use of laxatives is very common in the target setting, where around 40% of the patients there admit for orthopedic hip problems that require surgical intervention. Those patients would suffer from different level of immobilization from post-injury to postoperative period, making them more prone to constipation. Due to heavy workload, nurses seldom ask patients for their choices of treatment or consider other strategies for management of constipation, despite the fact that use of laxatives, no matter by oral or per-rectal route, is always declined by young patients. Hence, it is suggested that nurse should empower patients more by involving them in making decisions about treatment, as communication between nurse and client is essential to develop therapeutic trust and rapport (Gary, 2014).
In view of the disadvantages of using medications to treat constipation, abdominal massage, as a non-pharmacological method, is introduced and being appealing to the affected group. In fact, abdominal massage for the management of constipation was used as early as in 1870, and it was experienced as pleasurable and safe that the participants felt more comfortable with their bowel function improved after the treatment (La’ma’ s, Graneheim & Jacobsson, 2010). Most of the research studies about the use of abdominal massage on managing constipation showed positive effects in stimulating peristalsis and decrease colonic transit time in constipated patients, and will be further discussed in Chapter Two of this paper. On the behalf of patient, application of the massage therapy can be complementary to medication use, provided that patients usually refuse use of drugs in managing constipation for fear of the side effects such as cramping over abdomen and increased dependency on the drug. In this way, the practice of abdominal massage is more widely accepted, as it is non-invasive and non-pharmacological that could be self-managed by patients even at home with education provided. Although there are growing concerns on the application of abdominal massage in managing constipation, the scientific evidence regarding its effectiveness in the treatment of chronic constipation is still scarce (Sinclair, 2010). Currently there is no published systematic review to support the translation of existing evidences into practice; locally no available nursing guidelines can be found in applying abdominal massage to relieve constipation, suggesting that more studies regarding the effectiveness of this strategy are needed.
1.3 Objectives and Significance

The research question of this proposed study in PICO format is: How effective the abdominal massage, in comparison to the usual care, in prevention of constipation among patients after having hip surgery?

1.3.1 Aim and objectives

The aim of the proposed study is to develop an evidence-based guideline to improve the nursing care so as to prevent constipation among patients after having hip surgery. The objectives are listed as below:

1. To conduct a systematic review for evaluation of effectiveness of abdominal massage in management of constipation;
2. To evaluate the quality of studies, and to summarize and synthesize the data;
3. To develop an evidence-based guideline to prevent constipation in patients after having surgery using abdominal massage;
4. To assess the transferability and feasibility of implementing the massage therapy in current setting; and
5. To develop implementation strategies and evaluation plan for the evidence-based guideline.

1.3.2 Significance

As discussed in previous parts, constipation, though preventable, can lead to severe complications if not identified or not treated properly. However, the knowledge of health care providers about how to manage constipation is often limited; potential risks of constipation are usually masked and not being aware due to relatively low mortality rate (Gary, 2014). Hence, nurses should participate more in
managing the condition, particularly by performing a detailed history taking and clinical assessment to investigate the possible underlying causes of constipation. It is especially important for primary care nurses, as early detection and prevention could avoid more severe health consequences.

With the implementation of evidence-based practice guideline over the use of abdominal massage in patients after having hip surgery, the possibility of constipation is reduced, the symptoms of constipation is relieved and the risk of postoperative complications is minimized. In patients’ aspect, hospital visit and length of hospitalization are also reduced and therefore, the quality of life could be enhanced.

For the health care provider, the implementation of an EBP guideline can aid decision-making on use of alternative strategies to manage constipation in addition to usual medication, and provide detailed instruction of applying abdominal massage to constipated patients. As the massage therapy can help to prevent, alleviate constipation and reduce the likelihood of postoperative complication, the workload and stress in handling those undesirable health consequences could be minimized. In addition, the EBP guideline can offer a systematic approach to planning, implementing and evaluating the nursing practice over management of constipation.

On a more macroscopic view, the quality of service provided can be improved with the implementation of the proposed EBP guideline; patient’s confidence and satisfaction toward the hospital service and health care system will be enhanced. In this way, less healthcare costs and resources on managing constipation and its complications are anticipated, and therefore health cost will be reduced.
CHAPTER 2

CRITICAL APPRAISAL

2.1 Search and Appraisal strategies

2.1.1 Identification of studies

Identifying potential and relevant studies is an essential component in translational nursing research. A three-step search strategy was utilized. To begin with, an initial electronic search for all available evidences were conducted; four renowned electronic databases were used which included CINAHL Plus (EBSCOhost), Medline (EBSCOhost), British nursing index (ProQuest) and Database from Hospital Authority named eKG (Ovid). In second search, various keywords were identified and searched across the four included databases in order to obtain potential articles. Thirdly, a manual search of the listed reference in the identified literatures was performed so as to obtain additional journals for enrichment of the content of my study. The titles and abstracts of the searching results were then screened according to the inclusion and exclusion criteria (as listed below). For those considered to be potentially relevant, the full-text article was retrieved and reviewed to further look for its eligibility.

Different keywords were used to conduct searching for articles that relevant to my research topic, which could be classified into three groups. The first group of keywords concerned the clinical problem identified, including “constipation” and “bowel symptom”; the second group of keyword referred to the intervention, and wording like “abdominal massage” was used; the third group of keywords described
the characteristic of the study population using word texts as “postoperative” and “surgery”. Since different authors might use different words with similar meaning to describe a common idea, those keywords should be searched both individually and in different combination to ensure more potential articles were yielded. For instance, the keywords within same group were entered into databases using “or” to include all possible findings, whereas using “and” between difficult groups of keywords to narrow down the findings to more specific ones.

2.1.2 Selection criteria

For the inclusion criteria, studies are chosen if they: (1) were randomized controlled trials (RCTs) in view of higher level of evidence; (2) used language only English or Chinese to avoid language barrier; (3) evaluated the effect of abdominal massage in adult patients; (4) assessed the subjects diagnosed with constipation; and (5) were published in 1995 or for years afterwards to ensure the data obtained was up-to-date and reliable.

For the exclusion criteria, studies are rejected if they: (1) examined pediatric population; (2) focus on pharmacological intervention, and (3) did not provide full-text article.

2.1.3 Data extraction

After reviewing the eligible literature, the data including bibliographic citation, study type, level of evidence, sample size, subject characteristics, intervention and control, length of study, outcome measures and effect size were extracted. Since there were variations in the kinds of outcome measures, statistical pooling and direct comparison of the outcome findings between different studies was inappropriate.
Therefore, a table of evidence (TOE) was established using the extracted data to provide a clear, accessible and comprehensive summary of the selected studies and hence, allows easier determination of the answer for the research question (i.e. the effectiveness of abdominal massage in prevention of constipation).

### 2.1.4 Appraisal strategies

The quality of studies is an essential criterion to determine if the evidences extracted from literature review is worthwhile utilizing for this dissertation. The quality of each individual article was assessed and evaluated by using appraisal tools named Scottish Intercollegiate Guidelines Network (SIGN, 2014). The SIGN checklist consists of two sections: internal validity and overall assessment of the study, which is used commonly to determine if the study is of high level of reliability and validity with minimum bias identified. The following aspects were addressed in the checklist:

1. Clarity of research question
2. Randomization procedure
3. Allocation concealment
4. Degree of blinding
5. Similarity of intervention and control groups
6. Treatment under investigation
7. Appropriateness of measurement tools
8. Dropout
9. Intention-to-treat analysis
10. Similarity of results between different centers
After completing the appraisal of the selected articles using SIGN checklist, the level of evidence was rated according to the evidence statements and grades of recommendations established by Scottish Intercollegiate Guidelines Network (2014), from highest grading “1++” to lowest grading “4”, which is shown in Appendix 1.

2.2 Results

2.2.1 Search results

Electronic and manual searching was conducted from 18th September, 2015 to 22nd September, 2015. A total of 86 relevant articles were yielded through the four databases: CINAHL Plus (EBSCOhost), Medline (EBSCOhost), British nursing index (ProQuest) and eKG (Ovid); an additional 23 articles were retrieved through browsing Google Scholar. After reviewing the abstract and title of the studies identified, duplicated studies were removed and only 46 articles left. The remaining articles were further screened with reference to the inclusion and exclusion criteria, with 5 full-text articles eligible for this proposed study. However, no extra literature was extracted from searching reference lists of the eligible studies. A detailed search history and the search flow diagram are shown in Appendices 2 and 3 respectively.

2.2.2 Overview of the selected articles

There were five studies selected in the searching procedure: (McClurg et al., 2011; La´ma’s et al., 2010; La´ma’s et al., 2009; Emly et al., 1998; Kassolik et al., 2015). Tables of evidence were established for each independent study, which are shown in Appendices 4 to 8. Information on the author, study type, level of evidence, subject characteristics, sample size, intervention and control, length of study, outcome measures and effect size were listed clearly in the tables.
In Appendix 4, McClurg et al. (2011) reported a significantly positive effect of abdominal massage on relieving the symptoms of constipation among patients with multiple sclerosis, with provision of advices on bowel management as the control. It was an 8-week study with outcomes measured at 4 weeks post-treatment and at the end of the study.

Appendix 5 shows an 8-week study conducted to evaluate the change in health related quality of life (HRQoL) for constipated people and estimate the cost-effectiveness of massage therapy. Intervention lasted for 7 weeks and data collected from questionnaire that administered at the end of the study (Lama´s et al., 2010).

In Appendix 6, Lama´s et al. (2009) concluded that abdominal massage had significantly reduced the severity of gastrointestinal symptoms, according to the result obtained from the 8-week study among constipated people.

In Appendix 7, the study was a cross-over trial among two randomized groups of profoundly disabled people with constipation aimed to compare the effectiveness of abdominal massage against laxative therapy in management of constipation. One group received massage therapy for the first phase and usual laxative therapy in second phase with one week wash-out period in-between, and vice versa for the other group being studied. Gastro-intestinal and segmental transit time was used for the primary outcome measure. Emly et al. (1998) reported that there was not much difference between the effect of massage and laxative therapy, but both interventions demonstrate significant effect in relieving constipation.
In Appendix 8, the aim of study was to determine the effectiveness of massage based on tensegrity principle in relieving constipation, with classical massage acting as the control. Although classical massage not the key intervention to be examined, the results revealed that the classical massage had considerate effects in management of constipation, which was statistically significant (Kassolik et al., 2015).

2.2.3 Study characteristics

The five selected papers included studies that were carried out in United Kingdom (McClurg et al., 2011 & Emly et al., 1998), Sweden (La`ma`s et al., 2009 & 2010) and Poland (Kassolik et al., 2015). They were published between 1998 and 2015 and all of them were randomized control trials. Among them, four of the studies included an intervention group and a control group to examine the difference between groups in managing constipation, except the study of Emly et al. (1998) was a cross-over trial to investigate the effectiveness of two interventions (laxative and massage) in managing constipation and do comparison. Meanwhile, all studies used classical massage therapy as an intervention except the study of Kassolik et al. (2015) that classical massage was used as control for comparison with the massage based on tensegrity principle.

Two single-centered studies identified were conducted by McClurg et al (2011) and Emly et al. (1998). For the two studies conducted by La`ma`s et al. in 2009 and 2010, the recruitment of subjects was via local newspapers, notices at care centers and nursing homes. The subjects of Kassolik et al.’s study (2015) were recruited from two university-based primary care centers.
The sample size of the five studies is similar, ranging from 29 to 50. There was no significant difference in the demographic characteristics between the intervention and comparison in the five studies, including age, gender, marital status and history of laxative use. The mean age of the five studies varied from 42.25 to 63.7. Female subjects were predominant in all the studies. All the subjects recruited had routine use of laxative before the studies and suffered from certain degree of physical immobility due to their co-morbid status. However, there was considerate difference in the degree of physical mobility among the subjects in study of Emly et al. (1998), varying from ambulant, partially dependent to totally dependent.

For outcome measurements, various standardized assessment tools were used to describe the severity of constipation, as reported in studies of McClurg et al (2011) and La´ma´s et al. (2009). Another two studies (La´ma´s et al., 2010 & Kassolik et al., 2015) used questionnaire to determine the bowel and health statues in terms of the frequency of bowel movement, experience of bowel symptoms and perceived level of comfort. On the other hand, Emly et al. (1998) employed a radiographic method to examine the transit time of stool within the abdomen during the study.

2.2.4 Methodological quality of studies

The quality of each individual article was evaluated according to the appraisal tools of the SIGN Checklist (See Appendices 9 to 13). All the five studies were ranked in a higher level in the hierarchy of evidence as they were RCTs. Among them, the studies conducted by McClurg et al. (2011), La´ma´s et al. (2009) and Kassolik et al. (2015) rated higher level as “1+”, whereas the other two studies (La´ma´s et al., 2010 & Emly et al., 1998) were rated as “1-”. The paper quality was evaluated in the following aspects:
i. Clarity of research question

The research questions and objectives were clearly and appropriately addressed in each of the five studies. A clear conclusion was also stated at the end of the articles.

ii. Recruitment of subjects

In studies of La¨ma°s et al. in 2009 and 2010, the recruitment of subjects was via local newspapers, notices at care centers and nursing homes; in study of McClurg et al. (2011), the recruitment was also volunteer-based, which is known as non-probability sampling. The self-referring nature of recruitment would decrease the generalizability and accountability of the research findings.

iii. Allocation of subjects

All the five studies claimed that subjects were randomized to the intervention or comparison group. In the study of La´ma’s et al. conducted in 2009 and 2010, subject allocation was done by block randomization by means of drawing lots. For McClurg et al.’s study (2011), participants were randomly allocated using a web-based system. However, the remaining two studies did not mention about the method of randomization (Emly et al., 1998 & Kassolik et al., 2015).

iv. Allocation concealment

In the study of Emly et al. (1998) and Kassolik et al. (2015), concealment was mentioned but the method was not described. For the other three studies, concealment was described in using computerized allocation systems and codes to differentiation.
v. Degree of blinding

For the studies carried out by McClurg et al. (2011) and La`ma°s et al. (2009 & 2010), blinding was not possible due to the nature of the study. The remaining two studies retained high level of blinding to the subjects, therapists and analyzers.

vi. Similarity between groups

There was no significant difference in the demographic characteristics between intervention and comparison group in the five studies in general. However, there was considerate difference in the physical mobility among the subjects in the study of Emly et al. (1998), where physical immobility is one of the factors affecting defecation.

vii. Treatment under investigation

Abdominal massage was regarded as intervention to manage constipation in four of the studies, except in one that it was used as control to compare the effect with other intervention (Kassolik et al., 2015). In general, the results of the studies were considered to be the effects of intervention because there was only one intervention in the studies. However, there were two interventions (laxative and massage therapy) in Emly et al.’s cross-over trial study (1998). Although there was one-week period of wash-out to avoid the bring-about effect of the first intervention, it is difficult to determine if the length of wash-out period was enough.
viii. Appropriateness of measurement tools

Standard and reliable measurement tools were used in studies (McClurg et al., 2011 & La´ma´s et al., 2009) that generated data of higher degree of objectivity.

ix. Dropout

The dropout rate is insignificant, ranging from the lowest 3.125% (Emly et al., 1998) to the highest 13.8% in studies of La´ma´s et al. (2009 & 2010). In fact, up to 20% dropout rate is still regarded as acceptable.

x. Intention-to-treat analysis

In the five studies, the method of intention-to-treat analysis was used with all participants included in the data analysis despite the loss of subjects during the study.

xi. Similarity of results between different centers

Only three papers indicated that the studies took place in multi-centers (La´ma´s et al., 2009 & 2010 ; Kassolik et al., 2015) that the results were found to be similar between different centers. As a matter of fact, the results synthesized from a multi-center study retain a higher level of generalizability.

2.3 Summary and Synthesis

2.3.1 Summary

For the five studies selected for data extraction and synthesis, the research question and study type are clearly stated. The effect of abdominal massage on management of constipation was examined regardless of the differences in the aim
and study design. For instance, two studies directly investigated the effectiveness of
massage therapy with comparison to group receiving standard treatment (McClurg et
al., 2011 & La´ma°s et al., 2010); one study indirectly examined the effect of massage
therapy in relieving constipation with the results reflected in the data concerning the
health-related quality of life (La´ma°s et al., 2009). Another two studies, one aimed to
compare the effectiveness of laxative and massage in relieving constipation (Emly et
al.,1998), while the other used classical massage therapy as control to examine the
effect of another intervention (Kassolik et al., 2015). Various outcome measurement
stools were used to determine the severity of constipation, colon transit time,
perceived health status and the bowel status. From the TOE listed in below
Appendices, the effect size varied from study to study; some of the studies failed to
demonstrate a significant difference between intervention and control such as the
secondary outcome measure in the study of McClurg et al. (2011). However, overall
results were consistent with each other studies that abdominal massage had
demonstrated significantly positive effect in alleviation of constipation.

There were also variations of the content of massage therapy in the five studies.
One researcher suggested that the length of massage should be long enough to provide
effects (Emly et al., 1998). There was no standardized technique of performing
abdominal massage; the therapy was provided by caregivers (McClurg et al., 2011),
nurses (La´ma°s et al., 2009 & 2010) or physiotherapist (Emily et al., 1998 &
Kassolik et al., 2015) in the studies selected.

2.3.2 Synthesis

Despite the results of the five studies prone to suggest abdominal massage as an
effective, alternative method in relieving constipation, there were diversities in the
study conclusion drawn. The reasons behind such differences could be multifold, and will be further discussed in the following parts.

The five studies were conducted in 3 different countries: Sweden, Poland and United Kingdom respectively. Cultural difference may be the contributing factors affecting the study result. For instance, Kassolik et al. (2015) pointed out that abdominal massage is an intimate action that might induce embarrassment to the participants that might affect the study result. Therefore, cultural sensitivity and consideration is an important issue to think about in systematic review of the literature.

Concerning the demographic data, no significant difference was detected between the intervention and control group at the beginning of the five studies, hence suggesting a greater contrast in the result between intervention and control. However, the characteristics of the five studies were quite difference. In one study, the subjects recruited were profoundly disabled people (Kassolik et al., 2015), whereas in another study, the participants were people with multiple sclerosis (McClurg et al., 2011). The difference between subjects probably accounts for the distinction between the study result and conclusion.

For the blinding issue, it was not possible to blind the subjects and researchers due to the nature of some studies (McClurg et al., 2011; La´ma’s et al., 2009 & 2010). High level of blinding to the subjects, therapists and analyzers can ensure the objectivity of the study and thus, bias can be minimized.
Moreover, the measurement tools used for the five studies were quite different. Diary was used for measuring the degree of straining experience and number of bowel movement in the study of Kassolik et al. (2015), which was simple for the participants to understand and record. However, the compliance of completing diary was low in the study of McClurg et al. (2011), and the data of the bowel pattern among participants was insufficient to determine the effect of abdominal massage in management of constipation. Therefore, it is important to encourage and reinforce the completion of data if diary is used. On the other hand, it was quite common for the number of bowel movement to be used as an outcome measure, which was used in three out of the five studies (Lama’s et al., 2009; Emly et al., 1998; Kassolik et al., 2015). The advantages of measuring the number of bowel movement per week are multifold: it is easy to determine the effect of abdominal massage in terms of the frequency of defecation, since constipation is defined as less than three defecations per week (Xin et al., 2014). Unlike other bowel symptom like straining, it is an objective data so that errors due to bias or personal perceptions can be avoided. Therefore, the number of bowel movement should be considered as appropriate for outcome measure in this proposed study.

2.3.3 Implication

To conclude, all the selected studies revealed that the abdominal massage is effective in alleviating constipation based on the systematic review of five RCTs. The evidences support the application of massage therapy in target setting. Therefore, an evidence-based practice guideline of using abdominal massage to prevent constipation is worthy for implementation in O&T units to improve patient outcome and the quality of care.
CHAPTER 3

TRANSLATION AND APPLICATION

In Chapter Two, the integrated review of several high-quality studies demonstrated that abdominal massage is effective to alleviate constipation. Therefore, it is worthy to translate the corresponding evidence and develop an evidence-based practice guideline of applying such therapy to maximize patient outcome and quality of service. Before applying the intervention to the local setting, it is necessary to assess the implementation potential in terms of transferability, feasibility and cost-benefit ratio, which will be discussed in this chapter.

3.1 Transferability

In determining the implementation potential of a proposed innovation in a target setting, transferability is one important issue that should be considered. The word “transferability” refers to the extent to which the studies’ findings can be applied and fit to different settings or organization, which is “a direct function of the similarity between the two situations or their associated fittingness” (Finfgeld-Connett, 2010). In this part, target setting, type of clients and philosophy of care will be further discussed.

3.1.1 Target setting and population

Abdominal massage is proposed to be implemented in Department of Orthopedics & Traumatology (O&T) in a public hospital which provides in-patient and out-patient service to a large population in the cluster. The admission of patients to O&T wards includes emergency type through Accident & Emergency unit as well as clinical type
for scheduled operation or therapy. There are four acute wards and three rehabilitation wards in O&T unit, providing continuous and comprehensive care to the patients.

The target clients of the proposed innovation are both female and male patients aged 18 or above, who are suffering from different kinds of orthopedic problems in hip that required surgical intervention. Age of 18 or above is considered as one of the entry criteria for the proposed care because individuals in this age group are adult and would be able to give legal consent for the study. Although female outnumbered male in population of constipation (Gary, 2014), both male and female patients are included because constipation affects individuals at both genders. To avoid language barrier, individuals who speak language other than Cantonese and English will be excluded. In addition, the target clients should be communicable and do not have hearing or cognitive impairment.

3.1.2 Transferability of findings

To assess whether abdominal massage can be applied to local setting, a comparison of the demographic characteristics of target clients and the population of reviewed studies is essential. Concerning the age, all participants in the five selected studies were aged over 18 or above, with mean age ranging from 42.25 to 63.7 (McClurg et al., 2011; La¨ma´s et al., 2009 & 2010; Emly et al., 1998; and Kassolik et al., 2015), which is similar to the target population that all are adults and majority of them fall into the age group of 58-72. Moreover, there is no significant difference in gender distribution between target population and the participants recruited in the five studies; both were dominant by female.
Another consideration is the racial and cultural background of the identified populations. Among the five reviewed studies, two of them were done in Sweden (La¨ma°s et al., 2009 & 2010), another two were carried out in the United Kingdom (Emly et al., 1998 & McClurg et al., 2011) and one conducted in Poland (Kassolik et al., 2015). This suggests that constipation could be a worldwide health problem that affects individuals in difficult countries with different ethnicity. Although the population in target setting consists of Chinese in majority whereas those of reviewed studies conducted in western countries, there is no evidence suggesting abdominal massage exerts different effect in management of constipation among different ethnic groups. Therefore, ethnicity should not be considered as a determinant affecting the transferability of the findings.

3.1.3 Philosophy of care

The aim of proposed care is to help patients who undergone hip surgery to reduce the likelihood of developing constipation as well as the associated complications so as to enhance the quality of life, and shorten the patients’ length of stay in hospital.

Being a public hospital in Hong Kong, the target hospital and the O&T Department shared similar mission with Hospital Authority (HA) that emphasizes “client-oriented care” and stresses the importance of quality service. “Vision”, “Mission” and “Values” are three core values of HA (Vision, Mission and Values, 2016). In recent years, HA emphasize the staff training and development; continuous quality improvement program, education and research were promoted to ensure safety and quality of service provided. New innovations are also encouraged to improve the existing practice and empower non-medical staff such as nurses to enhance the patients’ wellbeing and optimize their capability to reintegrate to community.
The proposed massage therapy is expected to reduce constipation among target clients and improve their quality of life; it meets the philosophy of O&T Department and is in line with the core values of HA. Therefore, it is more likely to gain full support from department and the hospital.

3.1.4 Number of clients to be benefited

According to my clinical observation, there were around 1600 patients admitted to the four acute orthopedic wards of the target hospital yearly. Among these patients, approximately 40%, i.e. 640 of them required hip surgery and the proportion is quite constant every year. Nevertheless, not all of them are eligible for my study; some might be excluded due to hearing and cognitive impairment, unfit physical condition, language barrier, etc. A proportion of them maybe lost due to deaths, transfer to another hospital in the same cluster for rehabilitation or early discharge. Hence, it is estimated that only 60% of the post-operative cases of hip surgery, i.e. 384 patients, will be available to participate in the proposed massage therapy.

3.1.5 Implementation and evaluation

The proposed project will be divided into three major phases: (1) preparation; (2) implementation, and (3) evaluation phases, which will take a period of 12 months in total.

In the preparation phase, two months will be required to write the proposal. Another two months will be spent on communicating with other involved parties and proposing the project to Chief of Service (COS) and Department Operational Manager (DOM). After getting approval, two months will be used to prepare education materials, questionnaire and provide internal training to nurses. In
implementation phase, a one-month pilot study will be carried out in the four acute wards (two male and two female wards) to collect data for modification of the study. After that, the proposed care will be implemented and lasted for three months. In the last phase, two months will be allowed for data collection and analysis to evaluate whether the objectives are achieved. A timeline of the program is available in Appendix 14.

3.2 Feasibility

Feasibility of an innovation depends on various practical concerns including the organizational climate, administrator support, availability of staff, skills and resources, autonomy of nurse to control over the innovation, friction within organization, and the potential for clinical evaluation.

3.2.1 Organizational climate and administrator support

In the selected setting, the climate of implementing a new program is positive. In every year, the hospital would invite all departments to participate in the “Kaizen project”, i.e. to implement new innovation to improve the current practice and enhance patient outcome. The project is greatly supported by the administration level of the selected department by providing nursing empowerment in initiating changes and the staff also actively participates.

Furthermore, the administrator of the selected setting highly promotes EBP in ward. EBP is highly valued to enhance the nursing professional status and quality of service. All staff is encouraged to participate in nursing forum and research study in order to provide the best possible care. As the proposed care was developed based on empirical evidences, it is likely to gain support from the administrator.
### 3.2.2 Availability of staff, skills and resources

Continuous staff training and development are greatly supported by the administrators. Majority of the registered nurses within the department are holder of Nursing Degree and more than half had completed their Master degree in Nursing. Besides, the working experience of registered nurses of the seven involved wards is around 6-10 years in average with nearly half had completed their post registration certificate course, implying that the nurses should be knowledgeable and experienced enough for the new implementation.

Under support from the administrators, a organizing committee will be established which consists of a consultant, nurse specialist (NS), one ward manager (WM) and one registered nurse (RN) from each involved O&T ward. Assigned RN in each ward will be counted as extra manpower that they will be exempted from ward duties, thus minimizing interruption to ward operation.

The group is responsible for the coordination of the whole implementation including provision of training to other staff, allocation of resources, and communication with different stakeholders. Train-the-trainer session will be provided to three RNs in each of the wards to ensure that they are capable to assess the patient’s risk of developing constipation, evaluating the severity of constipation, performing abdominal massage, monitoring the patient’s bowel pattern, etc.

Concerning the resource, hardware like venue for meeting and training sessions, computers and projectors are necessary, and is available in the activity room of one O&T rehabilitation ward. Materials for training and evaluation such as notes and questionnaires are also needed.
3.2.3 Autonomy to initiate and terminate the intervention

The proposed intervention, abdominal massage, is an evidence-based nursing intervention that could be initiated without physician’s order. Being important characteristics of a profession, nurses in the selected department have the autonomy (Keogh, 1997) to make decisions on the duration and type of massage applied; they are empowered to monitor the effect of the new practice and have the power to terminate the therapy based on the participant’s tolerance.

3.2.4 Friction within organization

Introduction of the proposed care to medical staff is essential because need of additional medical treatment for constipation is govern by the effectiveness of the massage therapy. A detailed proposal of the intervention will be sent to all doctors and the hardcopy will be kept in ward for doctor’s quick reference. Little opposition force is anticipated since the proposed intervention is implemented within O&T unit without involvement of other departments.

3.2.5 Potential for clinical evaluation

A process evaluation is a vital part of a program to ensure the proposed care is carried out smoothly. A formative evaluation will be carried out in the middle of the implementation to obtain useful data for further improvement of the new intervention. At the end of the implementation, a summative evaluation will be performed to determine the effectiveness of the innovation. Primary and secondary outcomes are the keys to measure the overall achievement of the new practice. The primary outcome is directly measured in terms of the number of defecation per week. The secondary outcome would be patient’s quality of life using health survey as assessment tool.
3.3 Cost-Benefit Ratio

To determine whether the proposed innovation is worthy to implement, it is necessary to estimate the cost and benefits to several parties such as the clients, staff and the organization. In addition, the material and non-material cost, the costs and benefits of not instituting an innovation should be considered as well (Polit & Beck, 2008).

3.3.1 Potential risk

Abdominal massage is considered as a relatively safe, non-invasive practice with little or no risk reported (Lama, 2011), and can be applied to individual of all ages (Smith & Moss, 2008). However, patients with known or suspected abdominal obstruction, with abdominal mass, and those who receive radiotherapy to their abdomen within six weeks are contraindicated to the therapy (Preece, 2002). Therefore, medical history must be reviewed by nurse in prior to minimize the risk. Patients would also be educated to observe and report any discomfort during the therapy.

On the other hand, not all staff would welcome and have interest in the new practice since massage therapy is relatively time-consuming (Ernst, 1990) that some may have a low morale to participate. Also the program may increase their working stress and hence affecting their working performance.

3.3.2 Potential benefit

As mentioned in previous chapter, abdominal massage can relieve constipation and effectively reduce the undesirable physiological and psychological consequences owing to the symptoms and stress to individuals. The total colonic transit time was
significantly reduced in patients with higher level of spinal cord injury, where they could not control the abdominal muscles to increase intra-abdominal pressure (Ayas et al., 2006). Although limited studies show that abdominal massage can entirely replace the traditional use of medication for constipation (Faleiros & de Paula, 2013), such a practice could offer alternate therapy for patients who are reluctant to drug use. Therefore, patients are empowered and their autonomy of choice of treatment is respected.

Apart from patients, staff can also benefit from the intervention. Due to the nature of massage, physical touch is involved which is a powerful, non-verbal mean of communication (Smith & Moss, 2008). Trust and rapport will be built between nurses and patients.

Unlike other duties of nurse such as doing documentation and implementing care plan, massage is “visible”, “concrete” and “quantifiable”; patients and relatives may appreciate for the effort paid by nurses and hence, more likely for the nurse to gain job satisfaction and working incentives. Furthermore, the proposed massage therapy provides opportunities for nurses to carry out an evidence-based practice; nurses could enjoy a high level of autonomy. Communication and organization skills of involved nurses could also be improved.

On the economic perspective, successful implementation of this project is expected to reduce constipation and its associated complications. As a result, the length of hospital stay and health care expenditure will be reduced.
3.3.3 Cost Estimation

Cost of running a program can be divided into material and non-material costs. For the material cost, it includes set-up cost and operational cost. Personnel expenditure makes up the set-up cost. Totally one nurse specialist and seven RNs from the organizing committee will involve in the meetings and preparation work, with approximate 8 hours expected to be spent. Moreover, total twenty-one RNs from the seven wards will form the working team where they will attend one briefing session and one train-the-trainer workshop in the preparation phase, and each will last for 1.5 hours. The expenditure on personnel salary is shown in Appendix 15.

For the operational cost, a large proportion accounts for the cost of massage therapy. Nurses will spend around 30 minutes daily for the proposed intervention: 5 minutes to prepare a comfortable environment before, 20 minutes to perform the therapy and another 5 minutes to document the procedure. The team will spend 4 hours per week for data collection and analysis.

As mentioned before, approximately 384 patients in the target setting are eligible for the program every year; whereas the average length of hospitalization due to constipation was 5.6 days (Thomas, 2014). As the estimated operational cost of serving a patient in general ward of public hospital is HKD $4680 per day (Fees and Charges, 2015), a substantial expenditure can be saved by the proposed program. A detailed calculation of the cost to be saved per year is shown in Appendix 16.

For non-material cost, sufficient time should be allowed for frontline nurses to assimilate the new information and intervention. In addition, adequate briefing and training are required to ensure the staff being competent for carrying out the program,
as hasty implementation could impose stress to staff that probably reduce their morale and increase staff turnover rate which in turns harm to patients.

It is also important to note that some items are excluded as ‘hidden’ costs in the cost calculation. For examples, the venue for meetings, paper materials (notes for staff training and copy of guidelines keep in ward), photocopiers, computer accessories and software are available in the unit so no extra cost needed. Besides, as the nurse specialist in the team was used to be a physiotherapist, she could teach other nursing staff about the massage technique so that cost could be saved from employing a therapist. Furthermore, the costs of involvement of consultant and ward manager are exempted because their participations are mainly as an advisor such that it is difficult to quantify their working time.

On the other hand, the implementation of abdominal massage is expected to lead to a reduction of laxative use. However, information about the exact reduction of laxative use was limited and cannot be determined. Therefore, underestimation in cost-saving regarding the implementation of program is anticipated.

In short, the cost to be saved per year from the new implementation is $10,063,876 (See Appendix 16), which is much greater than the total cost of running the program for one year, i.e. $459265.8 (See Appendix 15).
CHAPTER 4
EVIDENCE-BASED PRACTICE GUIDELINE

In view of the high susceptibility of target clients to constipation, the problem needs our immediate attention and action. The use of abdominal massage in reducing constipation has been reported as effective in various studies, yet its application to patients after having hip surgery is rare in Hong Kong. As discussed in previous chapters, the proposed intervention has a high potential for implementation. An evidence-based practice guideline for prevention of constipation will be presented as below with recommendations made upon the evidences from the reviewed articles. Recommendations were graded regarding to the grading system developed by Scottish Intercollegiate Guidelines Network (2014). After reviewing the five selected studies, five recommendations are generated.

Title:
Evidence-based guideline of using abdominal massage to prevent constipation for patients after having hip surgery

Aim
To establish a structured and comprehensive reference for nurses in O&T department to implement evidence-based abdominal massage to prevent post-operative constipation.

Objectives
1. To provide an instruction for nurses to apply the massage therapy;
2. To reduce the incidence and severity of constipation in target patients by applying abdominal massage;

3. To provide optimal management of constipation based on the best available evidence;

4. To encourage application of EBP within the department; and

5. To ensure that target patients receive safe, consistent and standardized care.

**Intended User**

Physicians and nurses are the major users of the guideline.

**Target population**

Evidence-based massage therapy would be provided to both male and female patients in O&T unit who have undergone hip surgery.

The Inclusive criteria are:
- Aged eighteen or above;
- Post-operative cases of hip surgery; and
- No hearing and cognitive impairment

The exclusion criteria are:
- Used language other than English or Chinese;
- Known or suspected to have abdominal obstruction;
- Presence of abdominal mass; and
- Received radiotherapy within six weeks

**Recommendation**

To grade the levels of evidence and recommendations, the Scottish
Intercollegiate Guidelines Network (2014) was used as the tool. The hierarchy of evidence is ranked from 1 to 4 that the highest level rated as 1++ and 4 as the lowest level. Symbols of “++” “+” and “-” indicate the overall quality of the articles with degree of bias from lowest to highest correspondingly. On the other hand, each recommendation was presented with either one of four grading “A”, “B”, “C” and “D” that grade A reflected the highest level of credibility and reliability for recommendation and “D” reflected the lowest value for recommendation that should be treated deliberately (See Appendices 1 & 7).

**Recommendation 1.0**

*Environment for abdominal massage to take place should be comfortable and relaxing.*  [Grade of recommendation: A]

A supportive, comfortable environment enables participants to relax, which could maximize the effect of abdominal massage in stimulating peristalsis of intestine. (La¨ma°s et al., 2009, 1+; Kassolik et al., 2015, 1+).

**Recommendation 2.0**

*A position of lying flat is maintained throughout the massage therapy.*  
[Grade of recommendation: B]

A lying position enables participants to relax (La¨ma°s et al., 2009, 1+) and facilitate the application of massage (Emily et al., 1998, 1-).

**Recommendation 3.0**
Duration of the massage therapy should last for 10-20 minutes.

[Grade of recommendation: A]

The five reviewed studies suggested applying massage with duration ranging from 10 to 20 minutes, and all showed positive effect in relief of constipation (McClurg et al., 2011, 1+; La`ma`s et al., 2009, 1+; La`ma`s et al., 2010, 1-; Emly et al., 1998, 1-; Kassolik et al., 2015, 1+).

**Recommendation 4.0**

*Length of intervention should be eight weeks or above.* [Grade of recommendation: A]

One of the reviewed studies suggested that three weeks of implementation was too short to demonstrate significant effect of abdominal massage in management of constipation (Kassolik et al., 2015, 1+). Besides, the mid-evaluation of other three studies did not show great difference between intervention and control groups, where significant difference were noted at the end of the studies, i.e. Week 8 (McClurg et al., 2011, 1+; La`ma`s et al., 2009, 1+; La`ma`s et al., 2010, 1-).

**Recommendation 5.0**

*Massage of circular movement in a clockwise direction should be adopted.*

[Grade of recommendation: A]

Movement in a clockwise direction presumed the course of colon, which could induce stimulation to the gut and hence facilitating peristalsis (McClurg et al., 2011, 1+; La`ma`s et al., 2009, 1+; Emly et al., 1998, 1-).
CHAPTER 5

IMPLEMENTATION PLAN

As discussed in Chapter Three, it is worthy to apply abdominal massage to prevent constipation in the target setting with consideration of its cost and benefit. However, successful implementation of a new practice depends greatly on the administrators’ awareness of the significance of evidences, support from the department, staff’s confidence about delivering the intervention and their adherence to it (de Velde et al., 2016). Therefore, it is essential to establish an implementation plan which includes a communication plan, a pilot test and an evaluation plan.

5.1 Communication Plan

Communication refers to a process of information transfer during which own ideas and understandings can be exchanged interpersonally. In implementation science, communication is the key to promote and turn the evidence-based research findings into the clinical setting (Manojlovich, 2015). The contents of the proposed care will be presented to the potential stakeholders through systemic communication panel to get their support and approval.

5.1.1 Identification of stakeholders

Stakeholders are groups or individual who can exert influence over or are influenced by an issue (Schiller et al., 2013). To initiate changes in clinical setting, it is important to address the interest of potential stakeholders with regard to the objectives of the innovation. For the proposed care, the potential stakeholders can be classified into four different groups: (1) the administrator of the department; (2) the
nurse; (3) the doctors, and (4) the target population.

Administrators include the Chief of Service (COS) and the Departmental Operation Manager (DOM) of the O&T Department in the target hospital, who are at the top level responsible for the departmental operation and allocation of resources. They have the authority to make the final decision for adoption and implementation of new policies or intervention.

For the nursing discipline, a nurse specialist (NS), a ward manager (WM) and seven registered nurses (RN) from O&T Department will form an organizing committee responsible for planning, implementation and evaluation of the project. The NS acts as the project coordinator whereas the WM act as the advisor for the project. Another twenty-one RNs will form a working team responsible for providing massage therapy to the target patients.

For the medical discipline, doctors act as the collaborative partners with nurses that they are interdependent; new practice in either discipline may affect the other one so that good communication between doctors and nurses is necessary. A consultant will also be invited to be the advisor for the proposed care.

It is important to note that patients and their relatives are also stakeholders because the implementation of proposed care requires their consent and support. The effectiveness of the proposed care also directly affects the health and life quality of the target patients.
5.1.2 Communication process

Effective communication can maximize the congruence between the expectations of different stakeholders and increase the likelihood for a successful implementation of an innovation. To ensure good communication between different parties, a concrete communication plan is essential. The estimated duration of the communication plan lasts about two months (See the flowchart in Appendix 18).

i. Communication with administrator

Upon addressing the clinical issue and affirming the needs of implementation, a proposal should be made and presented to the departmental administrators, i.e. COS and DOM.

In the presentation, the severity of constipation in local setting, program objectives, implementation timeline, budget and evaluation plan will be introduced. The content should be made concise and precise; emphasis on the significant research findings, cost-effectiveness of the proposed care and its potential benefit to patients should be made to convince the administrators that new change is necessary.

ii. Communication with doctor

The proposed innovation will be introduced to all O&T doctors via e-mail. The evidence-based benefits of abdominal massage will be emphasized and presented during the doctors’ weekly conference in order to get their support and cooperation.

iii. Communication with nurse

The communication channels among nursing staff include e-mail, handover in ward and the monthly nursing meeting. Increased autonomy for nurse, improved
nurse’s professional image, better rapport between nurse and patient as well as enhanced patient outcome will be highly promoted. As the staff involved in the organizing committee and working team may feel stressed for the new innovation, training and support will be emphasized in the nursing meeting.

**iv. Communication with patient and relative**

Patients are the direct recipients of care in the new implementation that their health and life quality will be affected by the proposed innovation. Pamphlets would be designed and delivered to the eligible individuals in order to enhance their understanding and acceptance.

**5.1.3 Communication strategies**

**i. Initiating the change**

The proposed innovation aims to prevent constipation in target setting. To initiate change, the proposer should prepare and present the proposal to the administrative level in order to obtain their support and approval. Upon getting the approval, the proposer has to coordinate with the other staff to form the organizing committee and working team.

To maximize the information coverage, the committee will adopt various communication channels as discussed above to ensure the proposed care is well-disseminated to stakeholders from all levels.
ii. **Guiding the change**

The main role of the committee is to coordinate all the implementation activities and to encourage the advance of the changing process. An implementation timeline will be set up to guide the changing process (presented in Appendix 14). The proposer and the NS will act as the collaborators to deal with problems and barriers arise during the changing process. Together with the seven RNs, they have to monitor the progress and keep the implementation on schedule. On the other hand, the two advisors will provide comments on the EBP guidelines and clarify any misconceptions to ensure that the whole implementation is in the right direction.

iii. **Sustaining the change**

To make the new innovation a success, the committee should take an active role in assessing the nurse’s compliance. The skills and knowledge on abdominal massage would be audited regularly to ensure the nurses are competent in providing high quality care. Moreover, the patient outcomes would be monitored to evaluate the effectiveness of the program. Feedbacks about the innovation are also welcome and all participants would be invited to express their opinion toward the new practice during the meeting. Recommendations from all parties will be considered seriously for the guideline refinement.

5.2 **Pilot Study Plan**

After communication with the stakeholders and staff training are completed, a small-scale testing, known as pilot study, will be conducted. Pilot study is actually preliminary or trial run of a full-scale research study performed to evaluate the feasibility and transferability of intervention (Cope, 2015). Through this process, potential barriers and problems could be identified so that the innovation could be
revised and modified before conducting the actual large-scale implementation.

5.2.1 Setting and duration

The pilot study will be conducted in the O&T Department of the target hospital, involving the staff and patients from four acute wards and three rehabilitation wards. Integrated activity room will be the location for staff training, meeting and massage therapy, which is the same place for the full-scale implementation. Duration of the pilot study will be one month.

5.2.2 Subject recruitment and sample size

Convenience sampling method is adopted to recruit a pool of adult patients who have undergone orthopedic hip surgery. To evaluate the project feasibility, the inclusion and exclusion criteria in the pilot testing should be identical to that of the full-scale implementation to minimize inaccuracy due to subject difference. As mentioned in Chapter Three, the admission number for the target population is quite constant every year. Based on my clinical observation, approximate 30 patients can be recruited for the pilot test.

5.2.3 Details of the pilot study

Facilitation is an important process in launching a pilot test to liaise different individuals or parties to cooperate and achieve a goal in common (Kitson & Harvey, 2016). Being the facilitator of the new innovation, all committee members are responsible for preparing the EBP guideline and promote the advance of changing process. The one-month testing will be started upon the completion of the staff training.
For each newly admitted case, the committee will screen for the eligibility based on the selection criteria using a referral form (See Appendix 19). Informed consent will be obtained from the target patients with all potential benefits and risks being stated. The massage therapy will be started on post-operative Day 2 to avoid intolerance due to immediate physiological response caused by anesthesia and analgesics. Nurses from the working team will spend 10-20 minutes daily for the massage therapy until patient discharge.

5.2.4 Data collection and instrument

Before applying abdominal massage, initial nursing assessment will be performed to acquire demographic information for baseline data using a designated form (See Appendix 20). Besides, a SF-12 Health Survey (See Appendix 21a & b) will be used to assess for any change in patient’s health-related quality of life (HRQoL) before and after the program. At the end of the program, a questionnaire will be delivered to the participants to evaluate the effectiveness of the massage therapy program (See Appendices 22a & b). All the data obtained from the pilot test will be included in the data analysis and is significant for the evaluation of the whole innovation.

5.2.5 Evaluation of pilot study

Based on the primary aim of conducting a pilot test, the acceptability, feasibility and compliance of staff for the proposed care will be reviewed; comments and recommendations about the implementation are also welcome for further refinement of the clinical guideline.
i. **Assessing acceptability**

The acceptability of staff to the proposed care could be determined by a staff satisfaction questionnaire (See Appendix 23), which will be distributed to nurses at the end of the pilot study. The data generated can directly indicate if they accept the proposed care and guideline.

ii. **Assessing feasibility**

Feasibility of a project depends largely on the availability of various resources including personnel, time and funding. By running a pilot test, the exact amount of resources required can be measured. Such information is helpful in determination of resource allocation and budget planning, predicting the possibility for the full-scale implementation.

iii. **Assessing compliance**

The committee members will carry out auditing every month until the patient discharge using the form attached in Appendix 24 to check for nurse’s compliance to the EBP guideline. On the other hand, the nurse who performs abdominal massage should document immediately after each massage session using a designated record form (See Appendix 25).

iv. **Interventions after Pilot Testing**

At the end of the pilot study, each nurse will complete a questionnaire to evaluate the effectiveness of the proposed innovation (See Appendix 26). The organizing committee will hold a meeting and invite all potential users to share their experiences on the innovation. Comments and suggestions toward this intervention are encouraged to clarify possible ambiguities during the pilot study. All the recommendations
collected will be used to rectify any underrating issues and refine the guideline for the large scale implementation.

5.3 Evaluation Plan

Evaluation is crucial to determine the effectiveness and the achievement of outcomes of a proposed innovation. The terms “process evaluation” is regarded as the procedure of reviewing a program in terms of the benefits and unintended consequences identified (Jaegers et al., 2014); these provide a clear direction for the administrator to determine the sustainability of the innovation and the need of further refinement in guideline.

5.3.1 Identification of outcomes

i. Patient outcome

Patient outcomes can be further classified into primary and secondary. For the proposed care, the primary outcome is to increase the number of defecations per week, since the frequency of bowel movement is one of the significant criteria for diagnosis of constipation (Xin et al., 2014).

Change in QoL, on the other hand, is the secondary outcome to be assessed. According to five studies reviewed before, constipation is greatly associated with a decreased HRQoL since it will cause physical, psychological and mental burden to the individuals.
ii. **Health care provider outcome**

Staff compliance is one indicator to reflect the effectiveness of an innovation, which implies their acceptance to new changes. To test for their compliance, auditing will be performed monthly by the organizing committee till patient discharge.

Besides, the skills, knowledge and competence of nurse are also important parameters to indicate the success of the intervention. With sufficient staff training, nurses will be empowered and competent to perform abdominal massage. As the proposed care is nurse-initiated evidence-based practice, nurses can therefore enjoy high level of autonomy; enhanced patient outcome is expected and hence, increase job satisfaction of nurses.

iii. **System outcome**

With the application of abdominal massage, the postoperative complications related to constipation are expected to be minimized. Thus, the length of hospitalization will be reduced such that resources and expenditure spent on management of constipation will be saved.

5.3.2 **Nature and number of Clients to be involved**

The eligibility criteria of recruiting clients should be consistent with that for recruitment in pilot study to ensure homogeneity of patient groups. The target group consists of both female and male patients aged 18 or above, who required surgical intervention to their hip joint. For those who speak language other than Cantonese and English, having hearing or cognitive impairment will be excluded.
To ensure the subject recruitment being large enough to generate similar effect size as that of the studies reviewed (See TOE in Appendices 4-8), an appropriate sample size calculation is necessary. In the proposed program, the sample size depends on the primary outcome measures, i.e. the frequency of defecation per week. An online software called G-power is adopted whereas a one sample t-test is used (G*Power, 2012). The effect size of the reviewed studies ranged from 1.104 to 1.3 (La¨ma° s et al., 2009; Kassolik et al., 2015), whereas 1.104 will be considered and used for conservative estimation. The level of significance and the power will be set at 0.05 and 80% respectively. By calculation, the recommended sample size is 98. Since the average attrition rate for the five reviewed studies (McClurg et al., 2011; Emily et al., 1998; La¨ma°s et al., 2009 & 2010 ; Kassolik et al., 2015) is 7.47%, 105 patients should be recruited with convenience sampling over a period of three months.

5.3.3 Time and frequency to take measurements

The time and frequency for each outcome measure may vary due to different effects exerted by different parameters in the study. Demographic information will be collected at the beginning to obtain baseline data.

Before the start and in between of the massage therapy, the number of bowel movement per week will be recorded. Concerning the patient’s QoL, a SF-12 Health Survey will be delivered to patients before and after the innovation to evaluate if there is improvement of QoL.

For the health care provider outcome, the staff compliance will be determined via audit on a monthly basis and upon the patient discharge. On the other hand, the skills, knowledge and competence of nurse will be evaluated immediately after the
staff briefing and training session, pilot study and at the end of the whole study.

With regard to the system outcome, the change in length of hospital stay as well as the resources and expenditure spent on management of constipation can be established by reviewing the annual expenditure at the end of the implementation.

5.3.4 Data analysis

Data collected in the pilot study and the full-scale implementation will be analyzed by Statistical Package for Social Science (SPSS). The results of all outcome measures are considered as statistically significant if the p value is less than 0.05.

Descriptive statistics of demographic information are used to reflect the characteristics of the participants for comparison. Such data can be obtained from the initial nursing assessment before massage therapy and will be assessed by using Chi-square tests.

As the primary outcome measure, the change in number of bowel movement after the intervention will be examined by reviewing the record form (See Appendix 25); for patient’s QoL, data analysis will be performed based on the information obtained before and after the intervention using one-sample t-test.

In view of the health care provider outcome, the nurses’ perception on the new innovation, enhancement in the skills, knowledge and confidence after the training sessions, satisfaction of the guideline would be analyzed based on the data obtained from the questionnaire.
For the system outcome, the change in length of hospitalization and expenditure will be determined by independent t-test with 5% level of significance.

5.3.5 Criteria for considering a practice as effective

To regard an innovation as effective, the data analysis for outcome evaluation must be of 0.05 level of evidence to consider as statistically significant. Based on the literature review done in Chapter Two, the innovation will be regarded as effective if the primary outcome, i.e. the patient’s number of bowel movement per week is increased by one time or more after the intervention. Moreover, the intervention can improve the quality of life in patients; it is also expected to enhance staff development by providing training; an improvement more than 50% in scoring of the questionnaire regarding patient’s HRQoL, nurse’s satisfaction toward applying EBP guideline will indicate the success of the intervention.

5.4 Conclusion

Constipation is a prevalent health problem with various health consequences associated. Abdominal massage, being proven by high quality research studies, can provide a safe and non-invasive way to prevent constipation among the susceptible individuals in the target setting. With the implementation of massage therapy, patients’ outcomes and quality of life, standard of practice, job satisfaction of nurse can be improved. For health system as a whole, the resource can be saved owing to a decrease in length of hospital stay.
Appendix

Appendix 1: Key to evidence statements and grades of recommendations

Scottish Intercollegiate Guidelines Network (2014)

<table>
<thead>
<tr>
<th>Level of evidence</th>
<th>Evidence statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1++</td>
<td>High quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias</td>
</tr>
<tr>
<td>1+</td>
<td>Well conducted meta-analyses, systematic reviews, or RCTs with a low risk of bias</td>
</tr>
<tr>
<td>1-</td>
<td>Meta-analyses, systematic reviews, or RCTs with a high risk of bias</td>
</tr>
<tr>
<td>2++</td>
<td>High quality systematic reviews of case control or cohort studies; High quality case control or cohort studies with a very low risk of confounding or bias and a high probability that the relationship is causal</td>
</tr>
<tr>
<td>2+</td>
<td>Well-conducted case control or cohort studies with a low risk of confounding or bias and a moderate probability that the relationship is causal</td>
</tr>
<tr>
<td>2-</td>
<td>Case control or cohort studies with a high risk of confounding or bias and a significant risk that the relationship is not causal</td>
</tr>
<tr>
<td>3</td>
<td>Non-analytic studies, e.g. case reports, case series</td>
</tr>
<tr>
<td>4</td>
<td>Expert opinion</td>
</tr>
</tbody>
</table>
Appendix 2: Table of search strategies

<table>
<thead>
<tr>
<th>Search ID</th>
<th>Keyword</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CINAHL Plus</td>
</tr>
<tr>
<td>#1</td>
<td>Constipation</td>
<td>1107</td>
</tr>
<tr>
<td>#2</td>
<td>Bowel symptom</td>
<td>206</td>
</tr>
<tr>
<td>#3</td>
<td>Abdominal massage</td>
<td>18</td>
</tr>
<tr>
<td>#4</td>
<td>Postoperative</td>
<td>14479</td>
</tr>
<tr>
<td>#5</td>
<td>Hip Surgery</td>
<td>1148</td>
</tr>
<tr>
<td>#6</td>
<td>#1 or #2</td>
<td>1256</td>
</tr>
<tr>
<td>#7</td>
<td>#4 or #5</td>
<td>16390</td>
</tr>
<tr>
<td>#8</td>
<td>#3 and #6</td>
<td>7</td>
</tr>
<tr>
<td>#9</td>
<td>#6 and #7</td>
<td>105</td>
</tr>
<tr>
<td>Limited to publication from 1995 to 2015</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Eligible articles according to inclusion and exclusion criteria</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Duplication</td>
<td>/</td>
<td>2</td>
</tr>
<tr>
<td>Reference tracing</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Total number of studies identified</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3: PRISMA 2009 Flow Diagram
### Appendix 4: Table of Evidence A

<table>
<thead>
<tr>
<th>Bibliographic citation/ Study type/ Level of evidence</th>
<th>Sample characteristics</th>
<th>Intervention (I)</th>
<th>Control (C)</th>
<th>Length of study</th>
<th>Outcome measures</th>
<th>Effect size (ES) (Intervention-control)</th>
</tr>
</thead>
</table>
- 18 (60%) female  
- A confirmed diagnosis of multiple sclerosis (MS)  
- Fulfilled the Rome II criteria for constipation | - Provision of advice on bowel management; and - Education to patients or caregivers on how to deliver abdominal massage with recommendations to perform it daily for a 4-week intervention period | Provision of bowel management advice only (n = 15) | -8 weeks in total  
- Week 0 (Baseline/ pre intervention) | - Week 4 (Post intervention)  
- Week 8 (Follow-up) | Primary:  
(1) Constipation Scoring System (CSS)---(c)  
Secondary:  
(2) Neurogenic Bowel Dysfunction Score (NBDS);---(d)  
(3) Multiple Sclerosis Impact Scale (MSIS);---(e)  
(4) The Qualiveen Questionnaire---(f)  
(5) 7-day bowel diary---(g) | Week 0 to Week 8:  
(1) -3.6  
(2) -5.01  
(3) & (4) No data indicated (just mentioned no significant difference)  
(5) N/A (as diary poorly completed) |

(a) Scottish Intercollegiate Guidelines Network (2014)  
(b) For making a diagnosis of constipation  
(c) 8-item questionnaire to describe the severity of constipation  
(d) 10-item questionnaire to measure the degree of bowel dysfunction  
(e) Scale to evaluate the quality of life of patients with MS  
(f) 30-item questionnaire to assess the bladder-related quality of life in neurological patients  
(g) Diary recording bowel pattern for 7 consecutive days
### Appendix 5: Table of Evidence B

<table>
<thead>
<tr>
<th>Bibliographic citation/Study type/Level of evidence</th>
<th>Sample characteristics</th>
<th>Intervention (I)</th>
<th>Control (C)</th>
<th>Length of study</th>
<th>Outcome measures</th>
<th>Effect size (ES) (Intervention-control/comparison of p value)</th>
</tr>
</thead>
</table>
- 26 (52%) female
- Fulfilled the Rome II criteria for constipation | - Abdominal massage for 15 minutes/day for 5 days/week for 8 weeks; and
- Laxative intake was changed or ended gradually on basis of clinical judgment (n = 25) | Continued with the original therapy used (n = 25) | - 8 weeks in total
- Week 0 (Baseline/ pre intervention)
- Week 1-8 (intervention)
- Week 4 & 8 (Questionnaire administered) | EQ-5D classification system---(c)
(1) Health state description (profile) ---(d)
(2) Visual Analogue Scale (VAS) | Week 0 to Week 8:
(1) 0.004 [p=0.088]
[Not statistical significant as p >0.05]
(2) 0.950 [p=0.011]
[ES is large because sufficient benefits if score ≥ 0.076] |

(a) Scottish Intercollegiate Guidelines Network (2014)
(b) For making a diagnosis of constipation
(c) System commonly used in cost effectiveness analysis for calculation of health gains in quality-adjusted life years (QALYs)
(d) Consists of five statements about mobility, self-care, usual activities, pain/discomfort and anxiety/depression using a 3-point Likert scale ranging from ‘no problem’ to ‘great problem’.
(e) Scale ranging from 0 (the worst imaginable health state) to 100 (the best imaginable health state)
### Appendix 6: Table of Evidence C

<table>
<thead>
<tr>
<th>Bibliographic citation/Study type/ Level of evidence</th>
<th>Sample characteristics</th>
<th>Intervention (I)</th>
<th>Control (C)</th>
<th>Length of study</th>
<th>Outcome measures</th>
<th>Effect size (ES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>La<code>ma</code>s, K., Lindholm, L., Stenlund, H., Engstro¨ma, B. &amp; Jacobsson, C. (2009). Effects of abdominal massage in management of constipation - A randomized controlled trial. <em>International Journal of Nursing Studies</em>, 46, 759-767.</td>
<td>- Over 18 years of age - Fulfilled the Rome II criteria for constipation</td>
<td>- Abdominal massage for 15 minutes/day for 5 days/week for 8 weeks; and - Instruction to take less laxative when experienced improved gastrointestinal function (n = 25)</td>
<td>Continued with the original therapy used (n = 25)</td>
<td>-8 weeks in total</td>
<td>Primary: (1) Gastrointestinal Symptom Rating Scale (GSRS)---(c) (2) Constipation (3) Abdominal pain (4) Indigestion (5) Diarrhoea (6) Number of bowel movement Secondary: (7) Bristol scale---(d)</td>
<td>(1) -0.262 [p=0.003] (2) -0.518 [p=0.014] (3) -0.164 [p=0.074] (4) -0.124 [p=0.150] (5) 0.036 [p=0.099] (6) 1.104 [p=0.016] (7) -0.670 [p=0.38]</td>
</tr>
</tbody>
</table>

(a) Scottish Intercollegiate Guidelines Network (2014)
(b) For making a diagnosis of constipation
(c) A self-administered questionnaire divided into 5 subscale with Likert scale ranging from 1 (no discomfort) to 7 (very severe discomfort)
(d) A seven point Likert scale where 1 represents “separate hard lumps like nuts” and 7 “watery, no solid pieces”
## Appendix 7: Table of Evidence D

<table>
<thead>
<tr>
<th>Bibliographic citation/ Study type/ Level of evidence</th>
<th>Sample characteristics</th>
<th>Intervention (I)</th>
<th>Comparison (C)</th>
<th>Length of study</th>
<th>Outcome measures</th>
<th>Effect size (ES) (Intervention-comparison)</th>
</tr>
</thead>
</table>
| Emily, M., Cooper, S. & Vail, A. (2015). Colonic Motility in Profoundly Disabled People – A comparison of massage and laxative therapy in the management of constipation. *Physiotherapy, 84*(4), 178-183. | *- Mean age: 42.25 - 18 (56.3%) female - Cerebral palsy or genetic condition with symptoms of abnormal muscle tone - Regular use of laxatives/ enemas for at least 12 months in prior* | *-Two interventions (20-min massage conducted 5 times/ week for 7 weeks, and usual laxative regimen for 7 weeks with 1 week of wash-out period between interventions) - Group 1: massage first, then laxative (n = 15) -Group 2: Laxative first, then massage (n = 16)* | *Using subjects’ baseline information for comparison* | *-18 weeks in total - Week 0-1 (Baseline/ pre intervention) - Week 2-9 (Phase A: intervention) - Week 10 (Wash-out period) - Week 11-18 (Phase B: intervention)* | *Primary: (1) Gastro-intestinal and segmental transit times - Secondary: (2) Enema requirement (3) Stool frequency (4) Stool size (5) Stool consistency (6) Well-being Group 1: (1) -35 (2)-(6) Cannot determine (No baseline data for comparison) - Group 2: (1) -71 (2)-(6) Cannot determine (No baseline data for comparison) [For both groups, ES were large using colonic transit time for outcome measure]* | *(a) Scottish Intercollegiate Guidelines Network (2014) (b) Gastro-intestinal and segmental transit times: a radiographic measure of the transit time of stool with the abdomen*
## Appendix 8: Table of Evidence E

<table>
<thead>
<tr>
<th>Bibliographic citation/ Study type/ Level of evidence</th>
<th>Sample characteristics</th>
<th>Intervention (I)</th>
<th>Comparison (C)</th>
<th>Length of study</th>
<th>Outcome measures</th>
<th>Effect size (ES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kassolik, K., Andrzejewski, W., Wilk, I., Brzozowski, M., Voyce, K., Jaworska-Krawiecka, E., et al. (2015). The effectiveness of massage based on the tensegrity principle compared with classical abdominal massage performed on patients with constipation. <em>Archives of Gerontology and Geriatrics</em>, 61, 202-211.</td>
<td>- Mean age: 57.8yrs - 18 (89.6%) female - Fulfilled the Rome III criteria for constipation</td>
<td>-Received 6 massage sessions based on tensegrity principle with 2 sessions/ week for 3 consecutive weeks (n = 15)</td>
<td>Received 6 massage sessions of classical massage with 2 sessions/ week for 3 consecutive weeks (n = 14)</td>
<td>-3 weeks in total - Week 0 (Baseline/ pre intervention)</td>
<td>Diary</td>
<td>(1) 1.87 vs 0.57 [p=0.01223] [ES is large and result is statistically significant]</td>
</tr>
</tbody>
</table>

(a) Scottish Intercollegiate Guidelines Network (2014)
(b) For making a diagnosis of constipation
(c) A diary developed by general practitioners from Wroclaw, Poland to record the bowel movement and/or experienced straining
## Methodology Checklist 2: Controlled Trials

### Study identification (Include author, title, year of publication, journal title, pages)

### Guideline topic:
Abdominal massage for the alleviation of constipation symptoms in people with multiple sclerosis

### Key Question No:

### Reviewer:
Chan Ka Man

### Before completing this checklist, consider:
1. Is the paper a **randomised controlled trial** or a **controlled clinical trial**? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a **controlled clinical trial** questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+
2. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

### Reason for rejection:
1. Paper not relevant to key question  
2. Other reason  (please specify):

### Section 1: Internal validity

### In a well conducted RCT study…

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>The study addresses an appropriate and clearly focused question.</td>
<td>Yes ✅ No ❌ Can't say ❌</td>
</tr>
<tr>
<td>1.2</td>
<td>The assignment of subjects to treatment groups is randomised.</td>
<td>Yes ✅ No ❌ Can't say ❌</td>
</tr>
<tr>
<td>1.3</td>
<td>An adequate concealment method is used.</td>
<td>Yes ✅ No ❌ Can't say ❌</td>
</tr>
<tr>
<td>1.4</td>
<td>The design keeps subjects and investigators 'blind' about treatment allocation.</td>
<td>Yes ☐</td>
</tr>
<tr>
<td>1.5</td>
<td>The treatment and control groups are similar at the start of the trial.</td>
<td>Yes ☑</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the treatment under investigation.</td>
<td>Yes ☑</td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes ☑</td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>Percentage of drop out = 1/30 x 100% = 3.33%</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes ☑</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>Yes ☐</td>
</tr>
</tbody>
</table>

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

| 2.1 | How well was the study done to minimise bias? |
| Code as follows: | High quality (++): ☐ |
| | Acceptable (+): ☑ |
| | Low quality (-): ☐ |
| | Unacceptable – reject 0 ☐ |

<p>| 2.2 | Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain |
| | No. Although the study is RCT and could fulfil most of the items on this checklist, due to the relatively small sample size (n = 30), I am not |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>that the overall effect is due to the study intervention?</td>
<td>certain if there is direct relationship between the intervention and overall effect, since some of the data are not statistically significant ($p &gt; 0.05$).</td>
</tr>
<tr>
<td>2.3 Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
<td>Yes</td>
</tr>
<tr>
<td>Notes. Summarise the authors' conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.</td>
<td>The study showed that the intervention had a potential positive effect on relief of the symptoms of constipation, and the authors also indicated the feasibility of further study in relieving constipation in patients with MS. However, due to the small sample size of this study and inadequate blinding, the generalizability and objectivity of the study is decreased.</td>
</tr>
</tbody>
</table>
## Methodology Checklist 2: Controlled Trials

### Study identification
*(Include author, title, year of publication, journal title, pages)*


### Guideline topic:
Abdominal massage to increase health-related quality of life and as a cost-effective method in managing constipation

<table>
<thead>
<tr>
<th>Key Question No:</th>
<th>Reviewer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Chan Ka Man</td>
</tr>
</tbody>
</table>

**Before** completing this checklist, consider:

1. Is the paper a **randomised controlled trial** or a **controlled clinical trial**? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a controlled clinical trial questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

2. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

**Reason for rejection: 1. Paper not relevant to key question □ 2. Other reason □ (please specify):**

### Section 1: Internal validity

*In a well conducted RCT study…*

<table>
<thead>
<tr>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Yes</td>
</tr>
</tbody>
</table>

| 1.1 | The study addresses an appropriate and clearly focused question. |
| □ Yes | □ No | Can't say |

| 1.2 | The assignment of subjects to treatment groups is randomised. |
| □ Yes | □ No | Can't say |

<p>| 1.3 | An adequate concealment method is used. |
| □ Yes | □ No | Can't say |</p>
<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Can’t say</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.4</td>
<td>The design keeps subjects and investigators 'blind' about treatment allocation.</td>
<td>☑️</td>
<td>☑️</td>
<td>❌</td>
</tr>
<tr>
<td>1.5</td>
<td>The treatment and control groups are similar at the start of the trial.</td>
<td>☑️</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the treatment under investigation.</td>
<td>☑️</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>☑️</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td></td>
<td>Percentage of drop out = (\frac{8}{58} \times 100% = 13.8%)</td>
<td></td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>☑️</td>
<td>❌</td>
<td>❌</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>☑️</td>
<td>❌</td>
<td>❌</td>
</tr>
</tbody>
</table>

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

2.1  
*How well was the study done to minimise bias?*

Code as follows:

- High quality (++)
- Acceptable (+)
- Low quality (-)
- Unacceptable – reject 0

2.2  
Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain... Yes
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3</td>
<td>Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
<td>Yes</td>
</tr>
<tr>
<td>2.4</td>
<td><strong>Notes.</strong> Summarise the authors' conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abdominal massage as a cost-effective way in managing constipation, with statistically significant results obtained in the study. However, the small sample size and non-blinding nature decrease the generalizability of the study. As the study aimed to determine if the massage therapy increase health-related quality of life, the EQ-5D profile used consisted of items may be more compatible to symptoms in irritable bowel symptom (IBS) than in constipation.</td>
<td></td>
</tr>
</tbody>
</table>
**Appendix 11: Scottish Intercollegiate Guidelines Network (SIGN) Checklist C**

### Methodology Checklist 2: Controlled Trials

**Study identification** *(Include author, title, year of publication, journal title, pages)*


<table>
<thead>
<tr>
<th>Guideline topic: Abdominal massage in management of constipation</th>
<th>Key Question No:</th>
<th>Reviewer:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Chan Ka Man</td>
</tr>
</tbody>
</table>

**Before** completing this checklist, consider:

1. *Is the paper a randomised controlled trial* or a *controlled clinical trial*? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a controlled clinical trial questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

2. *Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.*

**Reason for rejection:** 1. Paper not relevant to key question □ 2. Other reason □ (please specify):

### Section 1: Internal validity

*In a well conducted RCT study...*

<table>
<thead>
<tr>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong> The study addresses an appropriate and clearly focused question.</td>
</tr>
<tr>
<td>Can't say □</td>
</tr>
<tr>
<td><strong>1.2</strong> The assignment of subjects to treatment groups is randomised.</td>
</tr>
<tr>
<td>Can't say □</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>1.3</td>
</tr>
<tr>
<td>1.4</td>
</tr>
<tr>
<td>1.5</td>
</tr>
<tr>
<td>1.6</td>
</tr>
<tr>
<td>1.7</td>
</tr>
<tr>
<td>1.8</td>
</tr>
<tr>
<td>1.9</td>
</tr>
<tr>
<td>1.10</td>
</tr>
</tbody>
</table>

### SECTION 2: OVERALL ASSESSMENT OF THE STUDY

2.1

*How well was the study done to minimise bias?*

Code as follows:

- High quality (++)
- Acceptable (+)
- Low quality (-)
- Unacceptable — reject

Does not apply
| 2.2 | **Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?** | Yes |
| 2.3 | **Are the results of this study directly applicable to the patient group targeted by this guideline?** | Yes |
| 2.4 | **Notes.** Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above. |  

The study showed that the intervention had a potential positive effect on relief of the symptoms of constipation, while no significant differences were found between the intervention and control group in terms of consistency of stool or stool size. Due to the small sample size, relatively short study period, inadequate blinding, and self-referred nature of recruitment, the generalizability and objectivity of the study is decreased. |
Appendix 12: Scottish Intercollegiate Guidelines Network (SIGN) Checklist D

# Methodology Checklist 2: Controlled Trials

**Guideline topic:** Comparing the effect of laxative and massage therapy in management of constipation

**Key Question No:**

**Reviewer:** Chan Ka Man

---

**Before** completing this checklist, consider:

1. Is the paper a **randomised controlled trial** or a **controlled clinical trial**? If in doubt, check the study design algorithm available from SIGN and make sure you have the correct checklist. If it is a **controlled clinical trial** questions 1.2, 1.3, and 1.4 are not relevant, and the study cannot be rated higher than 1+

2. Is the paper relevant to key question? Analyse using PICO (Patient or Population Intervention Comparison Outcome). IF NO REJECT (give reason below). IF YES complete the checklist.

---

<table>
<thead>
<tr>
<th>Reason for rejection:</th>
<th>1. Paper not relevant to key question ☐</th>
<th>2. Other reason ☐ (please specify):</th>
</tr>
</thead>
</table>

---

## Section 1: Internal validity

**In a well conducted RCT study...**

<table>
<thead>
<tr>
<th>Does this study do it?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong></td>
<td>The study addresses an appropriate and clearly focused question.</td>
</tr>
<tr>
<td></td>
<td>Can't say ☐</td>
</tr>
<tr>
<td><strong>1.2</strong></td>
<td>The assignment of subjects to treatment groups is randomised.</td>
</tr>
<tr>
<td></td>
<td>Can't say ☐</td>
</tr>
<tr>
<td><strong>1.3</strong></td>
<td>An adequate concealment method is used.</td>
</tr>
<tr>
<td></td>
<td>Can't say ☐</td>
</tr>
<tr>
<td></td>
<td>Question</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1.4</td>
<td>The design keeps subjects and investigators 'blind' about treatment allocation.</td>
</tr>
<tr>
<td>1.5</td>
<td>The treatment and control groups are similar at the start of the trial.</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the treatment under investigation.</td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
</tr>
</tbody>
</table>

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Can't say</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>How well was the study done to minimise bias?</td>
<td>High quality (++)</td>
<td>Acceptable (+)</td>
<td>Low quality (-)</td>
</tr>
<tr>
<td>2.2</td>
<td>Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2.3</strong></td>
<td>Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2.4</strong></td>
<td><strong>Notes.</strong> Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The study aimed to compare the effect of laxative and massage therapy in management of constipation, and the results found that there was no significant different. However, the study gave an indication that abdominal massage can relieve constipation by evaluating its effect with the measure of colon transit time. Blinding is adequate in the study.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 13: Scottish Intercollegiate Guidelines Network (SIGN) Checklist E

Methodology Checklist 2: Controlled Trials

<table>
<thead>
<tr>
<th>Study identification</th>
<th>Include author, title, year of publication, journal title, pages</th>
</tr>
</thead>
</table>

Guideline topic: Investigation of effectiveness of massage based on the tensegrity principle compared with classical abdominal massage in managing constipation

<table>
<thead>
<tr>
<th>Key Question No:</th>
<th>Reviewer: Chan Ka Man</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Yes ☑ No ☐ Can't say ☐</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.1</th>
<th>The study addresses an appropriate and clearly focused question.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☑ No ☐ Can't say ☐</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.2</th>
<th>The assignment of subjects to treatment groups is randomised.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☑ No ☐ Can't say ☐</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1.3</th>
<th>An adequate concealment method is used.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes ☑ No ☐ Can't say ☐</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Question</td>
</tr>
<tr>
<td>---</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1.4</td>
<td>The design keeps subjects and investigators 'blind' about treatment allocation.</td>
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<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
</tr>
<tr>
<td>1.10</td>
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</tr>
</tbody>
</table>

**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

<table>
<thead>
<tr>
<th></th>
<th>Question</th>
<th>Yes ☑</th>
<th>No ☐</th>
<th>Can't say ☐</th>
<th>Does not apply ☐</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>How well was the study done to minimise bias?</td>
<td>High quality (++) ☑</td>
<td>Acceptable (+) ☑</td>
<td>Low quality (-) ☐</td>
<td>Unacceptable – reject 0 ☐</td>
</tr>
<tr>
<td>2.2</td>
<td>Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain</td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.3</td>
<td>Are the results of this study directly applicable to the patient group targeted by this guideline?</td>
<td>Yes</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>-----</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2.4</td>
<td><strong>Notes.</strong> Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.</td>
<td></td>
<td></td>
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</tbody>
</table>
Appendix 14: Timeline of an evidence-based program to prevent constipation in patients after having hip surgery

<table>
<thead>
<tr>
<th>Event \ month</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<th>11</th>
<th>12</th>
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<td>Getting approval</td>
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<tr>
<td>Preparation of</td>
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</tr>
<tr>
<td>materials &amp; staff</td>
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<td></td>
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</tr>
</tbody>
</table>
Appendix 15: Table showing set-up and operational cost in terms of personnel salary of the evidence-based abdominal massage therapy

<table>
<thead>
<tr>
<th></th>
<th>Nurse specialist</th>
<th>RN (Team member)</th>
<th>RN(Non-team member)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>1</td>
<td>7</td>
<td>21</td>
</tr>
<tr>
<td>Hourly Salary (HKD)*</td>
<td>$259</td>
<td>$163</td>
<td>$163</td>
</tr>
</tbody>
</table>

**Set-up cost**

<table>
<thead>
<tr>
<th>Hour used</th>
<th>Meeting and preparation</th>
<th>8</th>
<th>8</th>
<th>/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Briefing session</td>
<td>Organizer</td>
<td>1.5</td>
<td>1.5</td>
<td>/</td>
</tr>
<tr>
<td></td>
<td>Attendant</td>
<td>/</td>
<td>/</td>
<td>1.5</td>
</tr>
<tr>
<td>Training session</td>
<td>Trainer</td>
<td>1.5</td>
<td>1.5</td>
<td>/</td>
</tr>
<tr>
<td></td>
<td>Trainee</td>
<td>/</td>
<td>/</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>Subtotal (HKD)</strong></td>
<td></td>
<td><strong>$2849</strong></td>
<td><strong>$1255</strong></td>
<td><strong>$10269</strong></td>
</tr>
</tbody>
</table>

**Operational cost (per year)**

<table>
<thead>
<tr>
<th>Working hour (per year)</th>
<th>Application of massage</th>
<th>/</th>
<th>/</th>
<th>/</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data collection and analysis</td>
<td>4 x 52 = 208</td>
<td>4 x 7 x 52 = 1456</td>
<td>0.5 x 5.6 x 312 = 873.6</td>
</tr>
<tr>
<td><strong>Subtotal (HKD)</strong></td>
<td></td>
<td><strong>$53872</strong></td>
<td><strong>$237328</strong></td>
<td><strong>$142396.8</strong></td>
</tr>
</tbody>
</table>

**Total cost of running the program for one year (HKD)**

$459265.8
Appendix 16: Table showing the cost to be saved from implementation of program per year

<table>
<thead>
<tr>
<th>Cost to be saved per year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average duration of hospital stay for constipation (day)</td>
<td>5.6</td>
</tr>
<tr>
<td>Cost of hospitalization in general ward per day (HKD)</td>
<td>$4680</td>
</tr>
<tr>
<td>Number of patients benefit from the program per year</td>
<td>384</td>
</tr>
<tr>
<td>Total cost (HKD)</td>
<td>5.6 x $4680 x 312 = $10,063,876</td>
</tr>
</tbody>
</table>
## Appendix 17: Grades of recommendations

Scottish Intercollegiate Guidelines Network (2014)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>At least one meta-analysis, systematic review, or RCT rate as 1++, and directly applicable to the target population; or A body of evidence consisting principally of studies rated as 1+, directly applicable to the target population, and demonstrating overall consistency of results</td>
</tr>
<tr>
<td>B</td>
<td>A body of evidence including studies rated as 2++, directly applicable to the target population, and demonstrating overall consistency of results; or Extrapolated evidence from studies rated 1++ or 1+</td>
</tr>
<tr>
<td>C</td>
<td>A body of evidence including studies rated as 2+, directly applicable to the target population and demonstrating overall consistency of results; or Extrapolated evidence from studies rated as 2++</td>
</tr>
<tr>
<td>D</td>
<td>Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+</td>
</tr>
</tbody>
</table>
Appendix 18: Flowchart of the communication plan within the O&T Department

1. **Proposer**
   - Identify needs & provide evidence
   - Amend

2. **Organizing committee**
   - Gather information
   - Amend
   - Not agree
     - Nurse specialist
       - Agree for being the instructor of massage therapy
     - Not agree
       - Ward manager
         - Considered appropriate
         - Not agree
           - DOM
           - COS
             - Agree for implementation
             - Not agree
               - Surgeon and Nurse
                 - Agree for implementation
                 - Communication with targeted patients and their relatives
                   - Endorsement of proposed care
Appendix 19: Self-designed patient referral form for abdominal massage

Referral Form – Abdominal Massage Program to Prevent Constipation

Case No.: ________________________________________________________________
Diagnosis:________________________________________________________________
Name of operation: _________________ Date of operation: __________
Date of Referral: _________________ Referred by: ______________________

Referral checklist

<table>
<thead>
<tr>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Included if ALL criteria are met]</td>
<td>[Excluded if either one is met]</td>
</tr>
<tr>
<td>□ Aged 18 or above</td>
<td>□ With cognitive impairment</td>
</tr>
<tr>
<td>□ Undergone hip surgery</td>
<td>□ With hearing problem</td>
</tr>
<tr>
<td>□ No indication of constipation *</td>
<td>□ Speak language other than Cantonese and English</td>
</tr>
<tr>
<td></td>
<td>□ Presence of abdominal mass</td>
</tr>
<tr>
<td></td>
<td>□ Received radiotherapy within six weeks</td>
</tr>
</tbody>
</table>

* Rome II criteria for functional constipation
(To make a diagnosis of constipation, the patient must report two or more of the following criteria.)
- Straining in > 25% defecations
- Lumpy or hard stools in > 25% defecations
- Sensation of incomplete evacuation in > 25% defecations
- Sensation of anorectal obstruction / blockade in > 25% defecations
- Manual manoeuvres to facilitate > 25% defecations
- < 3 defecations per week
Appendix 20: Self-designed nursing assessment form for abdominal massage program

Nursing Assessment Form –
Abdominal Massage Program to Prevent Constipation

Patient’s gum label

Age: ________________________ Gender: □ Male □ Female

Marital status: __________ Current / last occupation: _______________

Diagnosis: _________________ Past medical history: _______________

Pre-morbid mobility:
□ Independent □ Ambulatory with aids/ assistance
□ Chair-bound □ Bedridden

Current use of opiate analgesics: □ Yes □ No
If yes, please specify: ________________

No. of bowel movement (per week): ________________

Current use of laxative: □ Yes □ No
If yes, please specify: ________________
Appendix 21(a): SF-12 Health Survey (English version)

**SF-12 Health Survey (Standard)**

Instruction: This questionnaire will ask about your perception and opinion towards the health status of your own. Please answer all the questions by ticking the appropriate boxes.

Date: _______________________       Name: ____________________ (optional)

Q1. In general, you would say your health to be:
   - □ Excellent
   - □ Very good
   - □ Good
   - □ Fair
   - □ Bad

The following two questions are about activities you might do during a typical day. Does your current health status limit you in these activities? If so, to what extent?

Q2. Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling, playing golf or practicing Tai Chi:
   - □ Yes, limited a lot
   - □ Yes, limited a little
   - □ No, not limited at all

Q3. Climbing several flights of stairs:
   - □ Yes, limited a lot
   - □ Yes, limited a little
   - □ No, not limited at all

During the past 4 weeks, have you had any of the following problems with your work or other usual activities as a result of your physical health?

Q4. Accomplished less than you expect:
   - □ Yes
   - □ No

Q5. Were limited in the kind of work or activities:
   - □ Yes
   - □ No
During the past 4 weeks, were you limited in the kind of work you do or other usual activities as a result of any emotional disturbances (e.g. feeling depressed or worried)?

Q6. Accomplished less than you expect:

☐ Yes  ☐ No

Q7. Being less careful as usual:

☐ Yes  ☐ No

Q8. During the past 4 weeks, how much did pain interfere with your usual work (including both domestic and non-domestic work)?

☐ Not at all  ☐ A little bit  ☐ Moderately  ☐ Quite a lot  ☐ Extremely

The following questions are about how you feel and react during the past 4 weeks. For each question, please choose the answer that comes closest to the way you have been feeling. How much of the time during the past 4 weeks?

Q9. Did you feel calm and peaceful?

☐ All of the time  ☐ Most of the time  ☐ A good bit of the time  ☐ Some of the time  ☐ A little bit of the time  ☐ None of the time

Q10. Did you feel energetic?

☐ All of the time  ☐ Most of the time  ☐ A good bit of the time  ☐ Some of the time  ☐ A little bit of the time  ☐ None of the time

Q11. Have you felt downhearted and blue?

☐ All of the time  ☐ Most of the time  ☐ A good bit of the time  ☐ Some of the time  ☐ A little bit of the time  ☐ None of the time

Q12. During the past 4 weeks, how much time did your physical health or emotional problems interfered with your social activities (e.g. visiting friends, relatives, etc.)?

☐ All of the time  ☐ Most of the time  ☐ Some of the time  ☐ None of the time  ☐ None of the time
Appendix 21(b): SF-12 Health Survey (Chinese version)

生活品質量表-SF-12 (標準)

指示: 這份問卷會問一些關於你健康狀況的意見，這些資料幫助我們了解及記錄你的健康狀況及你日常生活的狀況。請回答每一條問題。

問卷填寫日期：___________________ 姓名：_________________（非必須的）

1. 大致上，你覺得你的健康怎樣：
   - □ 十分好
   - □ 很好
   - □ 好
   - □ 不太好
   - □ 差

以下的問題是你通常在一天內會做好的事情，你現在的健康狀況是否有阻礙你做這些事情？如有，程度又多大呢？

2. 中等程度的活動，例如搬一張桌子，推一部吸塵器，打保齡球，打高爾夫或打太極拳？
   - □ 有很大阻礙
   - □ 有些少阻礙
   - □ 沒有阻礙

3. 步行上幾層樓梯
   - □ 有很大阻礙
   - □ 有些少阻礙
   - □ 沒有阻礙

在過去四星期內，有沒有因為你的身體健康狀況令你在工作上或其他慣常活動上出現以下的困難？

4. 完成的工作比想像中少：
   - □ 是
   - □ 否

5. 可以做的工作或活動的種類有限：
   - □ 是
   - □ 否
在過去四星期內，有沒有因為你的情緒上的困擾（例如抑鬱或擔憂）令你在工作上或其他慣常活動上出現以下的困難？

6. 完成的工作比想像中少：
   □ 是  □ 否

7. 沒有比平時做得那麼小心：
   □ 是  □ 否

8. 在過去四星期內，痛楚對你慣常的工作（包括家務非家務性的工作）影響有多少？
   □ 完全沒有  □ 有些  □ 有  □ 頗多  □ 十分多

以下題目是關於你在過去四星期內的感受及對事情的觀感，請在每一題目選擇最接近你的感覺的答案。在過去四星期內，你有多少時間是：

9. 感到平靜及和諧呢？
   □ 所有時間  □ 大部分時間  □ 頗多時間  □ 有些時間  □ 有少許時間  □ 從沒有

10. 感到充滿精力呢？
    □ 所有時間  □ 大部分時間  □ 頗多時間  □ 有些時間  □ 有少許時間  □ 從沒有

11. 感覺傷心及憂心呢？
    □ 所有時間  □ 大部分時間  □ 頗多時間  □ 有些時間  □ 有少許時間  □ 從沒有

12. 在過去四星期內，有多少時間因為你身體健康狀況或情緒問題而令你的社交活動影響（例如探訪親友）？
    □ 所有時間  □ 大部分時間  □ 有些時間  □ 有少許時間  □ 從沒有
Appendix 22(a) : Self-designed questionnaire for patients (English version)

Questionnaire for the “Evidence-based guideline of using abdominal massage to prevent constipation” for patients undergone hip surgery

Thank you for your participation in the program. Your feedback for the EBP guideline and intervention is important for improvement of all aspect of the program. Please complete the questionnaire form based on your own perspectives.

Date: _______________________       Name: ____________________ (optional)

From a patient’s point of view, how would you rate the following questions? Please put a “✔” to indicate the most appropriate column for each question.

Q1. Do you think the daily abdominal massage is adequate?
   □ Very adequate □ Adequate □ Neutral □ Inadequate □ Very inadequate

Q2. Do you think nurses provide adequate care for prevention of constipation during your hospital stay?
   □ Very adequate □ Adequate □ Neutral □ Inadequate □ Very inadequate

Q3. Do you think nurses have adequate knowledge and in providing care for prevention of constipation?
   □ Very adequate □ Adequate □ Neutral □ Inadequate □ Very inadequate

Q4. Do you think nurses are skillful to perform abdominal massage for prevention of constipation?
   □ Very skillful □ Skillful □ Neutral □ Unskillful □ Very unskillful
Q5. How do you rate the effectiveness of the abdominal massage program in prevention of constipation?

☐ Very effective   ☐ Effective   ☐ Neutral   ☐ Ineffective   ☐ Very ineffective

Q6. How do you rate your overall level of satisfaction to the abdominal massage program?

☐ Excellent   ☐ Good   ☐ Satisfactory   ☐ Fair   ☐ Poor

Q7. What are your comments or suggestions for further improvement of the abdominal massage program in prevention of constipation?

____________________________________________________________________________________
____________________________________________________________________________________
Appendix 22(b): Self-designed questionnaire for patients (Chinese version)

預防便祕腹部按摩計劃問卷調查
感謝你參與「預防便祕腹部按摩計劃」，你寶貴的意見對於改善計劃及提升服務質素是非常重要的。請完成此問卷，多謝你的參與和合作。

問卷填寫日期：___________________ 姓名：__________________(非必須的)

請以病人的角度評價以下各項目。請以☑號表示出你的選擇。

1. 你認為每日一次的腹部按摩足夠嗎？
   □ 非常足夠 □ 足夠 □ 無意見 □ 不足夠 □ 非常不足夠

2. 在你住院期間，你認為護士在預防便祕方面，有給予足夠的護理嗎？
   □ 非常足夠 □ 足夠 □ 無意見 □ 不足夠 □ 非常不足夠

3. 你認為護士有足夠的知識為你提供預防便祕的護理嗎？
   □ 非常足夠 □ 足夠 □ 無意見 □ 不足夠 □ 非常不足夠

4. 你認為護士有熟練的技巧為你提供預防便祕的腹部按摩嗎？
   □ 非常熟練 □ 熟練 □ 無意見 □ 不熟練 □ 非常不熟練

5. 你認為腹部按摩能有效預防便祕嗎？
   □ 非常有效 □ 有效 □ 無意見 □ 不太有效 □ 完全無效

6. 整體而言，你對我們提供的預防便祕腹部按摩計劃滿意嗎？
   □ 非常好 □ 好 □ 滿意 □ 尚可 □ 差

7. 最後，你對預防便祕腹部按摩計劃有沒有其他意見作日後改善之用？
   __________________________________________________________________________

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Appendix 23: Self-designed staff satisfaction survey on the staff training and pilot study

Staff Satisfaction Survey on the Staff Training and Pilot Study of Abdominal Massage Program

Date: ____________________________
Name: ____________________ (optional) Rank: ______________________

This questionnaire inquires about your level of satisfaction about the staff training and the pilot study of the abdominal massage program. Please indicate your ratings of the following presentation by choosing the appropriate number based on your own opinion, using a scale from 1 (least agree) to 5 (most agree).

<table>
<thead>
<tr>
<th>Part I: Briefing session</th>
<th>Statement</th>
<th>Least agree</th>
<th>Neutral</th>
<th>Most agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>The aim and objectives were clear to understand.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Q2</td>
<td>The content was organized and easy to follow.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Q3</td>
<td>The content was relevant and useful.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Q4</td>
<td>The speaker was knowledgeable of the subject matter.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Q5</td>
<td>The presentation skill of speaker was satisfactory.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Q6</td>
<td>The pace of presentation was appropriate</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Q7</td>
<td>The duration was appropriate.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Q8</td>
<td>The venue was suitable.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
### Part II: Training Session

<table>
<thead>
<tr>
<th>Statement</th>
<th>Least agree</th>
<th>Neutral</th>
<th>Most agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q9</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q10</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q11</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q12</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q13</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q14</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q15</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q16</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

### Part III: Pilot study

<table>
<thead>
<tr>
<th>Statement</th>
<th>Least agree</th>
<th>Neutral</th>
<th>Most agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q17</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q18</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q19</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q20</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q21</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q22</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q23</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q24</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
### Appendix 24: Self-designed audit form for abdominal massage

**Audit form for abdominal massage**  
[Please stick patient’s gum label below; inform the organizing committee upon patient discharge]

<table>
<thead>
<tr>
<th>Patient’s gum label</th>
<th>Patient’s discharge date:</th>
<th>Remarks:</th>
<th>1. Eligible patient is selected.</th>
<th>Yes ☐</th>
<th>No ☐ Reason: ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>________________________</td>
<td></td>
<td>2. Massage is started on post-operative Day 2.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Abdominal massage is performed daily.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Each massage session lasts for 10-20 minutes.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Proper documentation is done after each session.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient’s gum label</th>
<th>Patient’s discharge date:</th>
<th>Remarks:</th>
<th>1. Eligible patient is selected.</th>
<th>Yes ☐</th>
<th>No ☐ Reason: ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>________________________</td>
<td></td>
<td>2. Massage is started on post-operative Day 2.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Abdominal massage is performed daily.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Each massage session lasts for 10-20 minutes.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Proper documentation is done after each session.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient’s gum label</th>
<th>Patient’s discharge date:</th>
<th>Remarks:</th>
<th>1. Eligible patient is selected.</th>
<th>Yes ☐</th>
<th>No ☐ Reason: ______</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>________________________</td>
<td></td>
<td>2. Massage is started on post-operative Day 2.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Abdominal massage is performed daily.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Each massage session lasts for 10-20 minutes.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Proper documentation is done after each session.</td>
<td>Yes ☐</td>
<td>No ☐ Reason: ______</td>
</tr>
</tbody>
</table>
Appendix 25: Self-designed record form for abdominal massage

**Abdominal Massage Record**

Please kindly complete the record form after each massage session. Withhold the abdominal massage program once diarrhea/patient intolerance occurs.

**Procedure:**
1. Start the program after breakfast.
2. Perform massage daily in a clock-wise direction for 10-20 minutes.
3. Continue current use of laxatives if prescribed.
4. If no/poor result, perform digital simulation on the next day as well.
5. If still no/poor result \( \geq \) 3 days or with fecal impaction indicated, perform digital evacuation.

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<tr>
<th>Date</th>
<th>Start Time</th>
<th>End Time</th>
<th>Laxative use (Y/N)</th>
<th>Fecal Elimination Time</th>
<th>Fecal Nature/Amount</th>
<th>Remarks</th>
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Appendix 26: Self-designed questionnaire for nurses in O&T Department

Questionnaire for the “Evidence-based guideline of using abdominal massage to prevent constipation for patients undergone hip surgery” for nurses in O&T Department

Thank you for your participation in the program. Your feedback for the EBP guideline and intervention is important for improvement of all aspect of the program. Please complete the questionnaire form based on your own perspectives.

Date: ______________________
Name: _______________(optional) Rank: ______________

From a nurse’s point of view, how would you rate the following questions? Please put a “✓” to indicate the most appropriate column for each question.

Q1. How do you rate the effectiveness of the guideline of using abdominal massage for preventing constipation in patients undergone hip surgery?

☐ Very effective  ☐ Effective  ☐ Neutral  ☐ Ineffective  ☐ Very ineffective

Q2. The briefing and training sessions provided by the organizing committee for implementation of the abdominal massage was useful.

☐ Strongly agree  ☐ Agree  ☐ Neutral  ☐ Disagree  ☐ Strongly disagree

Q3. Are you confident to perform abdominal massage after attending the two training sessions provided by the nurse specialist?

☐ Very confident  ☐ Confident  ☐ Neutral

☐ A little bit confident  ☐ Not confident at all

Q4. The skills and knowledge to prevent constipation by performing abdominal massage was enhanced after the implementation of program.

☐ Strongly agree  ☐ Agree  ☐ Neutral  ☐ Disagree  ☐ Strongly disagree
Q5. A sense of job satisfaction was developed after the implementation of the abdominal massage program.

☐ Strongly agree ☐ Agree ☐ Neutral ☐ Disagree ☐ Strongly disagree

Q5. How do you rate the feasibility of the abdominal massage program in the future?

☐ Very feasible ☐ Feasible ☐ Neutral ☐ Not very feasible ☐ Infeasible

Q6. How do you rate the workload that you encountered in the implementation of the abdominal massage program?

☐ Strongly acceptable ☐ Acceptable ☐ Neutral
☐ Unacceptable ☐ Strongly unacceptable

Q7. Do you support the continuum of the proposed massage therapy after the one year- implementation?

☐ Strongly support ☐ Support ☐ Neutral ☐ Oppose ☐ Strongly oppose

Q8. In conclusion, how do you rate the evidence-based practice guideline of abdominal massage in prevention of constipation?

☐ Excellent ☐ Good ☐ Satisfactory ☐ Fair ☐ Poor

Q9. What are your comments or suggestions for further improvement of this evidence-based practice guideline of abdominal massage in prevention of constipation?

_________________________________________________________
_________________________________________________________

Q10. Do you encounter any problems or difficulties during the implementation of the abdominal massage program? If yes, please specify.

_________________________________________________________
_________________________________________________________
Reference


Normal colon transit time in healthy Chinese adults in Hong Kong. *Journal of Gastroenterology and Hepatology, 19*, 1270-1275.


