Abstract of thesis entitled

A clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

Submitted by

KONG YUEN LING

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Stroke is a global serious disease. Every year, 15 million people suffer from stroke worldwide with 5 million of them left permanently disabled (World Health Organization, 2015). In Hong Kong, there are approximate 25 thousand people suffer from stroke annually. Majority of adult disability is due to stroke (The Hong Kong Stroke Fund, 2015). In consequence, rehabilitation is an important process for stroke patients to improve or restore their activity level. Rehabilitation should start as early as possible after stroke in order to have the largest effect. Nonetheless, there is no guideline stating when mobilization should start. The usual practice is to keep patient bed rest until doctors’ order. It always happens that patients only commence mobilization several days after admission. Nurses have no authority to decide when patients can begin mobilization. As a result, this dissertation aims to develop...
an evidence-based practice (EBP) guideline to let stroke patients start mobilization within 24 hours of stroke onset in suitable conditions.

A search of literatures was done in two electronic databases, PubMed and CINAHL Plus. Total six articles were chosen which met the inclusion criteria. Their qualities were all assessed by Scottish Intercollegiate Guideline Network (SIGN). Five out of six studies were graded as high quality. They proved that early mobilization within 24 hours of stroke onset is safe and can improve patients’ functional status and walking ability.

Then the results were used to develop an EBP guideline. After assessing the administrative support, availability of staff and resources, organizational climate and implementation method, the proposed guideline is considered to be feasible. It will bring benefits to patients, staff and the department. A 3-month pilot study will be carried out prior to a 6-month actual implementation to explore any potential implementation problems and to better refine the final guideline. The whole program will take 12 months to complete.

To evaluate the guideline, three aspects of outcomes will be measured, patients, nurses and department. The primary outcomes are patients’ functional status and quality of life. Other outcomes such as number of adverse events resulting from early mobilization, duration of hospital stay, psychological well-being of patients, nurses’ competency and satisfaction of the guideline, effectiveness of the training course will be measured. Last but not least, cost and benefits of the whole program will be compared during the evaluation.
A clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

Submitted by

KONG YUEN LING

BNurs, RN

A thesis submitted in partial fulfillment of the requirement for the Degree of Master of Nursing at the University of Hong Kong

August 2016
DECLARATION

I declare that this dissertation represents my own work, 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 qualification.

____________________________
KONG YUEN LING

August 2016
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## Abbreviations

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<td>AED</td>
<td>Accident and Emergency Department</td>
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<td>ADL</td>
<td>Activities of daily living</td>
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<td>ASU</td>
<td>Acute Stroke Unit</td>
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<td>APN</td>
<td>Advanced practice nurses</td>
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<td>AQoL</td>
<td>Assessment of Quality of Life</td>
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<tr>
<td>AC</td>
<td>Associate Consultant</td>
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<tr>
<td>CVA</td>
<td>Cerebrovascular accident</td>
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<td>COS</td>
<td>Chief of Service</td>
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<tr>
<td>DM</td>
<td>Diabetes Mellitus</td>
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<tr>
<td>DOM</td>
<td>Department Operation Manager</td>
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<tr>
<td>FIM</td>
<td>Functional Independence Measure</td>
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<tr>
<td>GCS</td>
<td>Glasgow Coma Scale</td>
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<tr>
<td>HCA</td>
<td>Health care assistants</td>
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<tr>
<td>HA</td>
<td>Hospital Authority</td>
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<tr>
<td>IA</td>
<td>Intra-arterial</td>
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<tr>
<td>MO</td>
<td>Medical officers</td>
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<tr>
<td>mRS</td>
<td>modified Rankin Scale</td>
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<tr>
<td>NIHSS</td>
<td>National Institutes of Health Stroke Scale</td>
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NC     Nurse Consultant
PICO   Patient Intervention Comparison Outcome
PT     Physiotherapists
RCT    Randomized controlled trials
rTPA   recombinant Tissue Plasminogen Activator
RMA    Rivermead Motor Assessment
SC     Standard Care
SIGN   Scottish Intercollegiate Guidelines Network
SPSS   Statistical Package for the Social Science
VEM    Very Early Mobilization
WM     Ward Manager
Chapter 1: Introduction

1.1 Background

Stroke, also known as cerebrovascular accident (CVA) or brain attack. It is “caused by the interruption of the blood supply to the brain, usually because a blood vessel bursts or is blocked by a clot. This cuts off the supply of oxygen and nutrients, causing damage to the brain tissue.” (World Health Organization, 2015). There are two main types of stroke: ischemic stroke and haemorrhagic stroke in which ischemic stroke is more common.

Ischemic stroke means the blockage of an artery that supplies blood to the brain while haemorrhagic stroke means brain cells are damaged as an artery in the brain ruptures. Both of these make the brain not functioning well (National Institutes of Health, 2015). The symptoms of stroke include sudden weakness or numbness on one side of the body, confusion, problem in speaking and walking, loss of vision, dizziness, difficulty in balance or coordination, severe headache, fainting or unconsciousness (World Health Organization, 2015). The symptoms can be lifelong and would become deficits which would seriously affect stroke patients’ activities of daily living and quality of life.

It is well established that stroke patients staying in organized stroke unit care have higher survival rate, higher chance to return home and become independent in looking after
themselves one year post stroke. Organized stroke unit care means all stroke patients are
grouped into the same ward managed by multidisciplinary teams who are exclusive in stroke
management. (Trialists’Collaboration, S. U., 2013). In Hong Kong, stroke patients are mostly
grouped in organized stroke unit care. It is sometimes called Acute Stroke Unit (ASU).
Nevertheless, whether early mobilization is one of the component of stroke unit care is not
clearly stated and is not adopted. The term early mobilization has different definitions. It may
refers to mobilization starting within 48 hours, 72 hours or few days after stroke onset. Here,
it is defined as out-of-bed activity started within the first 24 hours of stroke symptoms onset
(Bernhardt, Dewey, Thrift, Collier & Donnan, 2008; Bernhardt, Langhorne, Lindley, Thrift,
Ellery, Collier & Donnan, 2015; Chippala & Sharma, 2015).

1.2 Affirming the need
Every year, 15 million people suffer from stroke in the world with 5 million people die and
another 5 million people left disabled permanently (World Health Organization, 2015). In
Hong Kong, around 25 thousand people suffer from stroke annually and stroke is the major
reason of adult disability (The Hong Kong Stroke Fund, 2015). Cerebrovascular disease is the
fourth leading cause of death from 2003-2014 in Hong Kong. More than three thousand
people die because of stroke each year (Center for Health Protection, 2015). All these show
that stroke remains a serious disease nowadays. Special attention should be paid on stroke patients’ recovery and reduce their long term consequences.

According to Hospital Authority (2015), the existing guideline does not say whether to keep bed rest or allow mobilization after patients are admitted for stroke. There is no protocol stating when stroke patients can start mobilizing. The current and usual practice is that stroke patients should remain bed rest after hospitalised as it was thought that early physical rehabilitation after stroke may affect cerebral autoregulation. It may results in increased size of the ischaemic brain lesion because of the decline in cranial blood pressure and cerebral perfusion pressure (Diserens, Moreira, Hirt, Faouzi, Grujic, Bieler & Michel, 2012; Diserens, Michel, Bogousslavsky, 2006). Stroke patients are not allowed to leave the bed or walk a few steps under any circumstances, even though they merely have to transfer to another bed or stretcher nearby. They are only allowed to prop up in bed when having meal. The doctors would decide when patients can mobilize. It is common that doctors always forget to order when to mobilize as this is not their main concern. Moreover, the time to start mobilizing is already many days after stroke onset. On the contrary, others suggest that there is fewer risk of an apparent drop in blood pressure if stroke patients start mobilizing in the first few days after stroke as the sympathetic system will react strongly according to the level of ischaemic lesion (Panayiotou, Reid, Fotherby & Crome, 1999). Early physical rehabilitation may
benefit to have better reorganization and recovery of the brain function (Nudo, 2003). There may have potential advantages of bed rest. Nonetheless, most clinical studies do not support this. It has been proved that bed rest can cause complications that worsen recovery from critical conditions (Brower, 2009). Thus, it is recommended that the benefits of early mobilization are larger than the risks provided that patients’ conditions permits and staffs are trained to use a management programme in a stroke unit (Intercollegiate Stroke Working Party, 2012; Party, 2008; Skarin, 2011).

Researches have showed that levels of physical activity are low for hospitalised stroke patients (Bernardt, Dewey, Thrift & Donnan 2004; West and Bernhardt, 2011). After patients admitted for stroke, they would often stay in bed for few days after admission. This would cause them to have high risk of developing immobility related complications (Keating, Penney, Russell & Bailey, 2011), for instance, chest infections, pulmonary embolism, atelectasis, joint contractures, decreased range of movements, muscle atrophy, oedema, orthostatic blood pressure problems, poor blood oxygen saturation, urinary tract infections, insulin resistance, constipation, pressure ulcer, systemic inflammation and psychological problems (Askim, Bernhardt, Løge & Indredavik, 2012; Brower, 2009; English, McLennan, Thoirs, Coates,  & Bernhardt, 2010; Kilbride & Kneafsey, 2010). Around 85% of stroke patients would develop complications and immobility account for nearly 51% of death in the
first 30 days of stroke onset (Bernhardt, 2008). Many problems would arise especially for
stroke patients, such as ataxia, difficult balance in sitting and standing, unable to bear weight,
sensory, perceptual or cognitive deficits, low or high muscle tone and contractures. All these
result in higher chance of falls (Keating et al., 2011). A study reported that improved walking
function is the main recovery goal for most stroke patients (Pound, Gompertz & Ebrahim,
1998). As a result, studies had been done on early mobilization in stroke patients in order to
prevent these complications and problems and improved walking ability. It is considered to
be one of the important components that contributed to the survival and recovery benefits of
stroke unit care (Langhorne & Pollock, 2002). It is now highly advised that stroke patients
should mobilize as early as possible in case their clinical conditions allow (Askim et al.,
National Institute for Health and Clinical Excellence, 2008; Department of Health, 2007; as
cited in Keating et al., 2011).

Bed rest is no longer the appropriate treatment in stroke. It may even harm the patients.
However, without any guideline or protocol available on early mobilization for stroke
patients, nurses are worry to mobilize the patients so early. They are educated and are told
that they should not mobilize stroke patients especially in the first few days of stroke. They
still believe that bed rest provides the best outcome and they have to wait for doctors’ order.
They did not realize that there are many complications of bed rest. Moreover, they are afraid the incidence of falls will increase. Consequently, there is a need to develop a clinical protocol so that nurses can initiate to early mobilize the stroke patients. Nurses need to re-educate that stroke patients have very high chance to develop immobility complications and immobility account for the major reason of death.

On the other hand, functional status is an essential element in nursing care since nurses are responsible for sustaining and improving patients’ functional levels (McMillen, McCorke & Saunders, 1988). Thus, nurses have to learn how to enhance functional status of patients.

There is a published systematic review. However, it did not include all the articles in this dissertation. There is new good evidence emerged. Therefore, there is a need to develop an updated systematic review.

1.3 Objectives and Significance

The following are the objectives of developing this clinical protocol:

1. To evaluate the current practice of mobilization of stroke patients
2. To critically appraise the evidence of early mobilization within 24 hours of stroke onset in stroke patients

3. To develop a clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

4. To assess the transferability and feasibility of implementing the early mobilization protocol in stroke units in a local public hospital

5. To evaluate the effectiveness of the early mobilization protocol

The implementation of the early mobilization protocol can have various benefits. For patients, the protocol can let them have less risk of getting secondary complications come from bed rest. In addition, every patient wants to mobilize and regain the same activity level just as before stroke. Many patients complain that they do not like to do everything in bed, such as eating and toileting. It is very boring to stay in bed for several days given that their limb power is not that weak. They can do nothing but sleeping all the time which would affect their mood. They prefer to go to washroom freely and have a shower. They would be more satisfied even though they are allowed to have bed side activity merely. It is at least much better than staying in bed from day to night. Thus, having the early mobilization protocol is important as they can mobilize as they like. This can in turn promote the recovery
of stroke as rehabilitation can start earlier and patients are in better mood. Besides, the autonomy of nurses can enhanced. They do not have to wait for doctors’ order. Nurses can decide if the patients fit for early mobilization based on their clinical judgement. The work of nurses can be more efficient as they do not have to monitor if patients are keeping bed rest. This can also reduce the use of restraints in case patients are reluctant to keep bed rest. The harm to patients can be minimized both physically and psychologically.
Chapter 2: Critical Appraisal

2.1 Search and Appraisal Strategies

Study selection criteria

Studies that meet all of the following criteria were included:

1. Target population is stroke patients only, can be either ischemic or hemorrhagic stroke or both, either first or recurrent stroke
2. Intervention must be early mobilization within 24 hours of stroke onset
3. Outcome measure is functional status or quality of life
4. Articles are in either English or Chinese and are published within 2005-2015

Studies that meet any of the following criteria were excluded:

1. Target population are not merely stroke patients
2. Intervention is mobilization outside 24 hours of stroke onset or involves the use of other physical training methods such as robotic devices, treadmill training, electrical stimulation
3. Interventions are limited to upper limbs rehabilitation only
4. The study is systematic review
Search strategy

The Patient Intervention Comparison Outcome (PICO) framework is used to formulate and structure a clinical question in evidence based practice. It can be used to develop literature search strategies as well (Huang, Lin & Demner-Fushman, 2006). In this paper, Patient (P) is stroke patients, Intervention (I) is early mobilization within 24 hours of stroke onset, Comparison (C) is no mobilization within 24 hours of stroke onset or mobilization outside 24 hours of stroke onset, Outcome (O) is functional status and quality of life.

A search of literatures was carried out in two electronic databases in August to October 2015. They are PubMed and CINAHL Plus. The searching keywords were ‘Stroke’, ‘Early mobilization’, ‘Early mobilisation’. All the keywords were used in the two databases. Only articles in either English or Chinese were selected. Moreover, only articles published within 2005 - 2015 were chosen so that the results are appropriate for nowadays’ clinical environment. In order to screen out the most suitable articles, the titles of the searched articles were screened first according to the inclusion and exclusion criteria, followed by the abstracts. Those met the exclusion criteria or unrelated articles were excluded. Included articles were screened for eligibility, the full-text of the screened articles were assessed. Then if the articles were in low level of evidence or were pilot studies only would be further excluded.
**Appraisal Strategy**

In order to critically appraise the 6 selected studies, the checklists from Scottish Intercollegiate Guidelines Network (SIGN) were used as a tool to assess the methodology of the studies. The internal validity and overall assessment of each study was evaluated (Scottish Intercollegiate Guidelines Network, 2012a). This can ensure that the appraisal of the studies is in a standard, valid and reliable way. Furthermore, the level of evidence was graded according to the coding system provided by SIGN. The code was 1++, 1+, 1-, 2++, 2+, 2-, 3 or 4 (Scottish Intercollegiate Guidelines Network, 2011).

**2.2 Results**

**Search results**

By searching using the above keywords in the two databases, 193 possible articles were identified. 187 articles were come from PubMed and 6 articles were come from CINAHL Plus. After duplications removed, 188 articles were recorded. All of them were screened according to the inclusion and exclusion criteria mentioned above. 152 articles were excluded. Then, 36 full-text articles were regarded as relevant to the topic and were assessed for the eligibility. 30 full-text articles were eliminated as some are not randomized controlled trials (RCTs) and some are pilot studies only. At the end, 6 articles were chosen as eligible.
studies. A PRISMA flow diagram (Moher, Liberati, Tetzlaff, Altman & PRISMA Group, 2009) was attached to illustrate the whole process of literature search. (Appendix 1)

Table of evidence

The data of the six selected articles were extracted and recorded in the form of Table of Evidence. (Appendix 2) Some key points are highlighted as follows.

All six studies were RCTs. Other than Sundseth, Thommessen & Rønning (2014), all studies can reach the level of evidence 1+. Level of evidence of Sundseth et al. (2014) can only reach 1-. The target population were all stroke patients in all studies, consist of both ischemic and hemorrhagic stroke. In all six studies, at least 70% of the population was ischemic stroke patients. This is consistent with the proportion of the two types of stroke in the world. The median age of five studies was around 72 to 76 except Chippala & Sharma (2015), the median age was around 59. For the intervention, all studies had described the details of the intervention except one study (Sundseth et al., 2014).

Five studies measured the effect of early mobilization on functional status and one study measured quality of life (Tyedin, Cumming & Bernhardt, 2010) using Assessment of Quality
of Life (AQoL). Bernhardt, Dewey, Thrift, Collier & Donnan (2008), Bernhardt, Langhorne, Lindley, Thrift, Ellery, Collier & Donnan (2015) and Sundseth et al. (2014) used modified Rankin Scale (mRS) to measure outcome. Whereas Chippala and Sharma (2015) and Cumming, Thrift, Collier, Churilov, Dewey, Donnan & Bernhardt (2011) used Barthel Index to measure outcome. Additionally, time taken to walk 50 meters unassisted was used as outcome in Bernhardt et al. (2015) and Cumming et al. (2011). Cumming et al. (2011) also use Rivermead Motor Assessment (RMA) and Chippala and Sharma (2015) use length of hospital stay as outcomes. Moreover, Bernhardt et al. (2008) and Bernhardt et al. (2015) studied safety and feasibility of early mobilization as outcomes.

For the effect size, Chippala and Sharma (2015) showed intervention group had significant improvement in Barthel Index and shorter length of hospital stay. Cumming et al. (2011) also showed a significant positive association with Barthel Index and Rivermead Motor Assessment (RMA), return to walking was significantly faster as well. Bernhardt et al. (2008) and Bernhardt et al. (2015) found that early mobilization is safe and feasible as there was no significant difference in non-fatal serious adverse events, neurological serious adverse events, deterioration within the first seven days of stroke, patients’ perceived exertion after treatment and the number of falls and deaths. Tyedin et al. (2010) reported there was significant difference of quality of life at 75th percentile and in the domain of Independent living in
AQoL for the intervention group. Bernhardt et al. (2008) also reported it was significant for intervention group to have good outcome, i.e. modified Rankin Scale (mRS) score 0-2 at 3 and 12 months. However, Bernhardt et al. (2015) showed intervention group had fewer patients to achieve favorable outcome (mRS score 0-2) than usual care group and there was no significant difference in the time taken to achieve unassisted 50 meters walking. Besides, Sundseth et al. (2014) found the association with good outcome was not significant.

**Appraisal results**

SIGN checklists were used to evaluate the methodological quality of the six studies. The details of the checklists and the grading of the studies are attached in Appendix 3. All studies had clear focused question. All of them has used computer generated, randomization procedures. For Bernhardt et al. (2008), Bernhardt et al. (2015) and Cumming et al. (2011), randomization was stratified according to stroke severity and study sites. For Tyedin et al. (2010), it was stratified by stroke severity. Five studies had mentioned the concealment method excluding Sundseth et al. (2014). Merely Bernhardt et al. (2015) used trained staff to conceal and the other four studies used concealed opaque envelops. Besides, all studies are single-blinded. There is no significant difference of baseline characteristics between the intervention group and comparison group in five of the studies apart from Sundseth et al. (2014). It did not state whether the two groups have similar baseline characteristics. The
number of randomly assigned patients in both intervention and comparison groups were clearly stated in all studies. Sample size was provided other than Tyedin et al. (2010).

For all six studies, the outcomes are ‘measured in a standard, valid and reliable way’ (SIGN, 2012a). For instance, mRS, Barthel index, RMA, AQoL, etc. No studies had presented the dropout rate. They just reported the number of death and the number of lost to follow-up. Dropout rate was thus calculated based on the information given and was found that it varied among these studies. The lowest rate is Sundseth et al. (2014), 1.9%. It reported no one died and only one participant was lost to follow-up. Chippala and Sharma (2015) also reported no one died and there were six dropouts in each group because of family reason and lost to follow-up. Thus, the dropout rate is 13.95%. For other studies, death rate mainly pushed up the dropout rate. The dropout rate for Bernhardt et al. (2015) was 8.6% which include 7.6% death rate. In Bernhardt et al. (2008), Cumming et at. (2011) and Tyedin et al. (2010), dropout rate is 28.2% which include 23.94% death rate. Moreover, four studies had intention to treat analysis. Only Chippala and Sharma (2015) and Sundseth et al. (2014) did not mention this analysis. Furthermore, the settings range from single site to multiple sites. Small scales include a stroke unit in the University Teaching Hospital in India (Chippala & Sharma, 2015) and a stroke unit in Akershus University Hospital (Sundseth et al., 2014). Larger scales include acute stroke units of two large hospitals in Australia (Bernhardt et al., 2008;
Cumming et al., 2011; Tyedin et al., 2010). Large scale includes 56 acute stroke units in five countries which are Australia, Malaysia, New Zealand, Singapore, and the UK (Bernhardt et al., 2015). Results are comparable in multiple sites. No significant difference was raised.

2.3 Summary and Synthesis

In summary, five of the six selected articles, apart from Sundseth et al. (2014), are in good quality though there may have a low risk of bias. These studies were conducted in various countries; consist of Asian and European countries. Thus, the results can be applied not only in westerners, but also easterners. The inclusion and exclusion requirements of all studies were almost the same. These can be used in developing the protocol. The aim and content of the intervention were more or less similar and the only difference was the frequency of mobilization session. Even though the instruments in measuring the outcomes were not the same, they were actually measuring the same thing. There were several outcomes and the main outcomes were functional status and quality of life. Not every outcome had significant results.

Five of the six selected articles, other than Sundseth et al. (2014), were in high level of evidence (1+) since all of them were RCTs. They all contained computerized randomization, adequate concealment method and were single-blinded. All these can greatly minimize the
bias. Although Chippala and Sharma (2015) did not mention intention to treat analysis, the dropout rate is not high, the results would not be largely affected. Sundseth et al. (2014) did not state the concealment method, intention to treat analysis and did not state if the baseline characteristics of intervention and control groups were similar. Consequently, this article in minimize bias was in low quality.

Similar baseline characteristics of intervention and control groups make the results more reliable. Only Chippala and Sharma (2015) did not mention the data of first stroke or recurrent stroke. For other five studies, 67-81% of patients are their first stroke in each study. The premorbid condition was not very bad in all studies. The proportion of female to male was not in great difference. For the past medical history, hypertension, hypercholesterolemia and diabetes were the most common ones in all studies. Except that (Bernhardt et al., 2015) has large sample size of total 2104 patients, the sample size of other studies is relatively small, especially for Sundseth et al. (2014). Its sample size was calculated as 246 patients in total. Yet, merely 54 patients were recruited at the end due to slow recruitment. It was reported that no significant association on the outcome could be explained by the small sample size. Additionally, it had high risk of bias according to SIGN. Therefore, the results of Sundseth et al. (2014) is not used to develop the EBP guideline and is not being further analyzed in this dissertation. The sample size of other studies was 71 and 86. The median age
of the studies reflected that this intervention does not target on young patient, it does benefit old stroke patients. Both ischemic and hemorrhagic stroke patients can use this intervention, even for those who have received recombinant tissue plasminogen activator (rTPA). No evidence was revealed to be harmful for rTPA patients (Bernhardt et al., 2015). Additionally, this intervention does not apply to those who are moderate to severe disabled or in unstable or critical conditions. For the five studies that had significant results, their exclusion criteria include those premorbid mRS >2. This means this intervention can at most apply to patients whose mRS score 2, which means ‘Slight disability. Able to look after own affairs without assistance, but unable to carry out all previous activities.’ (Van Swieten, Koudstaal, Visser, Schouten & Van Gijn, 1998).

For the intervention, although all started mobilizing within 24 hours of stroke onset and the content were similar, the frequency of mobilization session were different. Bernhardt et al. (2015) stated there were minimum three more out-of-bed sessions than usual care and was focus on sitting, standing, and walking. It was continued for first two weeks or until discharge. Chippala and Sharma (2015) reported there were at least two times of mobilization which last for 5-30 minutes each day. It was continued for 7 days or until discharge. Activities were various, for example, roll and sit up, sitting with or without support, early or advanced walking activities. Bernhardt et al. (2008) and Cumming et at. (2011) presented that
the purpose was to aid patients to be in vertical position and move out of bed. There was minimum twice sessions per day and were continued for the first two weeks after stroke or until discharge. Tyedin et al. (2010) stated the aim was to stimulate the weakened limbs and antigravity muscle. Activities included sitting out of bed, standing and walking to the washroom. The session was up to four times per day and was last for 6 days per week in the first two weeks of stroke or until discharge. To sum up, the minimum frequency is two sessions each day and is continued for first 7 days of stroke. The training activities are mainly sitting, standing together with walking. This amount of mobilization is appropriate as there was no significant difference on the fatigue level in both groups (Bernhardt et al., 2008). Besides, training needs time. It is impossible that functional status would raise a lot suddenly with merely a session for a few days. Muscle memory is to be regained through more intensive training. By repetition, it can consolidate a motor action into memory. Therefore, it should be at least last for one week and being repeated every day (Krakauer & Shadmehr, 2006). It is important that the amount of activity should depend on each patient’s tolerance. The session must be omit or even suspend in case patient’s condition deteriorate. Thus, the content of mobilization varies among each patient.

The uses of outcome measures are appropriate in all studies. mRS is a widely used scale to measure the disability degree or level of dependence in daily activities in stroke patients.
Score of 0-2 represents no symptoms to slight disability while score of 3-6 represents moderate disability to death (Van Swieten et al., 1998). Score of 0-2 is regarded as good outcome in three studies (Bernhardt et al., 2008; Bernhardt et al., 2015; Sundseth et al., 2014). Besides, Barthel Index is a commonly used scale to evaluate the ability in performing activities of daily living (ADL) in 10 areas (Mosby's Medical Dictionary, 2009). Score range from 0 to 20, with lower score indicates higher disability. The 10 areas are assessing if patients have fecal incontinence, urinary incontinence, whether patient need assistance in grooming, toilet use, feeding, transfers (e.g. from chair to bed), walking, dressing, climbing stairs and bathing (Collin, Wade, Davies & Horne, 1988). Reliability and validity of both mRS and Barthel Index are demonstrated in Banks & Marott (2007) and Dewing (1991) respectively. Both scales can reflect the level of functional status. Those studies that used Barthel Index to measure outcome showed to have significant positive effect for intervention group. Nonetheless, the results of mRS are inconsistent. It may be because there are more categories being measured and the score is subdivided in more details in Barthel Index. Each condition of the patients can be more truly reflected in the score. This makes the resulting score more diverse. Consequently, the significant difference is more obvious and easier to measure. Conversely, there are only six scores in mRS. The comprised content in each score is too board. Patients with different conditions may be grouped in the same score. Thus the reflected score cannot further differentiate them. The details of ADLs cannot be shown
clearly. For instance, two patients have different scores in Barthel Index. However, they may score the same in mRS. It is harder to have a big difference in mRS score. Furthermore, premorbid mRS in half or more than half of the patients already score=0. Any change merely indicates a negative change, which means mRS score is poorer after the intervention. This can be explained that some studies cannot show the significant difference in mRS. Barthel Index is more preferred to use. Other than these two instruments, RMA is also used. RMA is used to evaluate the motor performance of stroke patients (Medical Dictionary, 2009).

Furthermore, walking 50 meters unassisted is a distance defined in Functional Independence Measure (FIM). FIM is used to assess the level of disability (Medical Dictionary for the Health Professions and Nursing, 2012). The reliability and validity of both RMA and FIM are presented in Canadian Partnership for Stroke Recovery (2015). For AQoL, it measures 5 areas, which are ‘illness, independent living, social relationships, physical senses and psychological wellbeing’. There are three items for each dimension. It is proved to be reliable, valid, easy to understand and can be finished quickly, usually 5-10 minutes (Hawthorne, Richardson & Osborne, 1999). To conclude, Barthel Index, RMA, walking 50 meters unassisted and AQoL are good measuring tools and are recommended to use.

For the effect size, Bernhardt et al. (2015) reported that early mobilization did not benefit the intervention to have better outcome. Moreover, there was no significant difference in
immobility serious adverse events and walking 50 meters unassisted. It had questioned that the results might be contaminated. More health care providers accept early mobilization nowadays and the issue is rising concern. The authors said that mobilization began earlier every year by usual care providers. It was found that around 60% of patients in the usual care group began mobilization within 24 hours of stroke onset. It may be the reason why there was no positive results. Nonetheless, the intervention outcomes were all statistically significant (p<0.0001). It showed that the median time to first mobilization for intervention group was 5 hours earlier than usual care group. The frequency for intervention group is higher. The daily amount and total amount of out-of-bed activities were greater in intervention group. As a result, it is undetermined whether the contamination affected the results or those were the true results. In Chippala and Sharma (2015), the median time to first mobilization was 11.5 hours faster in intervention group (p<0.001) and the median length of hospital stay reduced by 2 days (p<0.001). Cumming et al. (2011), Bernhardt et al. (2008) and Tyedin et al. (2010) all reported that the median time to first mobilization was 12 hours faster in intervention group (p<0.001) and the median total dose of mobilization was two times more than the standard care group (P<0.003). There was a great difference in intervention groups in all these studies. All these revealed that early mobilization within 24 hours of stroke onset is feasible and practical. Both the patients and nurses cooperate and follow this intervention.
To conclude, there is enough evidence to support that early mobilization within 24 hours of stroke onset can benefit stroke patients in terms of functional status and quality of life. The results of Barthel Index, RMA, AQoL and length of hospital stay were significant though the results of mRS and time taken to achieve 50 meters of unassisted walking were inconclusive. In addition, it is a safe and feasible intervention as adverse events and numbers of death and falls were not significantly higher. This intervention can be applied to both ischemic and hemorrhagic stroke patients who are within 24 hours of stroke onset, including those patients who have received rTPA treatment. Nevertheless, it is better for those patients who are in slight disability (mRS<3) and are in stable conditions to start early mobilization. Those who are in moderate to severe disability (mRS >2) and are in unstable medical conditions are not recommended to mobilize early.
Chapter 3: Implementation Potential and Clinical Guideline

In order to determine whether the EBP guideline is applicable in clinical setting, the implementation potential should be assessed in three areas, transferability, feasibility and cost-benefit ratio (Pilot & Beck, 2010).

3.1 Transferability

Transferability is assessed in terms of target client and setting, philosophy of care, benefit sufficient target clients and the duration of implementation and evaluation (Pilot & Beck, 2010).

Target clients and setting

The clinical setting of this dissertation is a combined neurology and neurosurgery ward in a local public hospital in Hong Kong. Total bed available is 53. It is an acute stroke unit in which anyone with onset of stroke within 24 hours will be admitted. Both ischemic and hemorrhagic stroke patients will be admitted to this ward regardless of their stroke severity. Most of the patients belong to mild to moderate stroke severity. There is 24 hours of rTPA service. Age of majority of patients are range from 60 to 85. Both male and female patients can be admitted and the ratio is similar.
The settings of the five selected studies are highly similar to the target setting. Those studies are all acute stroke unit so that patients within 24 hours of stroke onset were admitted. All of the studies admitted both ischemic and hemorrhagic stroke and both sex patients. One study, Bernhardt et al. (2015) even stated they included rTPA patients. Age of eligible patients are 18 or above. The median age was 59 to 74 and majority of patients were of mild to moderate stroke severity, which were in similar characteristics to our target patients. Moreover, the studies were not merely in western countries, but also Asian countries. The problem of racial difference is eliminated. All in all, patients’ characteristics and settings in all studies highly match with our target clients and settings.

**Philosophy of care**

The mission of Hospital Authority (HA) (2016) is “Helping People Stay Healthy”. While the mission of this target hospital is “we excel in the provision of holistic people-centred quality care through love, dedication and teamwork” (Hospital Authority, 2016). The philosophy of stroke nursing is written clearly in HA guideline, “the essence of stroke nursing is to help a person attain an optimal physical, spiritual and psycho-social well-being after a stroke incident. It aims at providing patient-centered quality stroke nursing care to individuals, families and community through integration of nursing practice, management, health education and research. Stroke patients should be encouraged to maintain a life that is as
independent and self-fulfilling as possible.” (Hospital Authority, 2015). This EBP guideline is patient-centered and aiming at facilitating patients’ recovery from stroke and helping them to return to normal and independent life through professional nursing care. Family burden will be minimized if patients have good recovery. Consequently, the philosophy of care of this innovation is consistent with the organizations and does not violate the work of nurses. This innovation should be promoted.

*Benefit sufficient target clients*

There are approximate 1000 patients, including rTPA, ischemic and hemorrhagic stroke patients being admitted to this ward every year. By general observation, around 20% is in severe stroke severity or in poor premorbid status and thus not suitable for this innovation. The remaining 80%, i.e. 800 patients are eligible for this innovation and can be benefit from it. Additionally, more and more people suffer from stroke nowadays and young stroke is getting popular. Stroke is no longer only happening in elderly, but is affecting increasing number of young people. Helping them to recover from stroke is important as they are the breadwinner and they have the highest rehabilitation potential. Restoring to walking ability, working ability and normal life is of first priority to them. As a result, it is worth to implement this EBP guideline as it can benefit a large group of patients.
Duration of implementation and evaluation

This EBP guideline will be carried out as a pilot program first in the setting mentioned above before the actual implementation. At the beginning, there will have two months for preparation period. In this period, there will be program introduction and promotion, training of staff and preparation of materials. Afterwards, a pilot program will be carried out for three months. Clinical data and feedbacks from staff will be collected at the same time. There will be a one-month period for evaluation. Then a modified EBP guideline will be set up. The guideline will be implemented in the target setting for six months. Finally, there will be one month for evaluation period. The modified EBP guideline and all of the findings and comments will be reported to the administrative level. The total period of implementation and evaluation will be seven months.

3.2 Feasibility
To evaluate the feasibility of this innovation, the following four areas will be assessed: availability of staff, method, organizational climate and availability of resource (Pilot & Beck, 2010).
**Availability of staff**

Every time when introducing a new practice or new policy, availability of staff is the most important thing. In order to implement the innovation successfully and run the program smoothly afterwards, getting the trust, willingness and cooperation from the staff is of utmost importance. Introduction and information sessions about the guideline background and evidence-based research findings will be held to clearly explain the program. The foreseeable positive outcomes and benefits will be explained so as to gain trust and support from staff.

All nurses can have the freedom to express their views and voice out their concerns. They will be authorized the autonomy to determine whether the patients’ condition are suitable to have early mobilization activities. They do not have to wait for doctors’ order unless the doctor has special order. If they think patients’ condition do not fit for early mobilization activities, they should document clearly the reason why patients are not suitable.

To enhance their confidence in carrying out the innovation, enrich their knowledge and refresh their skills, training courses will be provided to all nurses. The courses will be divided into two sessions – theoretical and practical sessions. Theoretical sessions will last for 30 minutes each. The condition under which circumstances are suitable or not suitable for early mobilization will be explained in details. In addition, type, frequency and duration of activities will be introduced. For each practical sessions, it will last for 60 minutes. Health
Care assistants (HCA) are also invited to join since nurses need help from HCAs to mobilize patients. Though nurses and HCAs have basic mobilization skills, they should attend these sessions to refresh their technique. There will be mobilization skills demonstration, nurses and HCAs will have to do return demonstration after that. This can make sure that they are familiar with the skills so that they will have no injuries during work and also play safe to the patients. Each nurse and HCA is required to attend the course/session once only.

If staff have any difficulties or dispute towards the program, they can approach the nurse consultant (NC). NC will try to solve the problem first. If any staff still dissatisfy or uncooperative, NC will hold a meeting with them together with other team members to discuss the problem.

Furthermore, it is foreseeable that more manpower is needed and the routine need to change a bit. There should be one compulsory mobilization session in morning and afternoon shift respectively. Preferably after monitoring patients’ Glasgow Coma Scale (GCS) and physiologic conditions. All nurses in that shift should involve. One nurse pair up with one HCA or two nurses pair up. Since there is not enough HCA, one agency HCA is needed in each shift. Total two agency HCAs need to be employed and they have to attend the practical sessions as well.
On the other hand, posters with a slogan will be posted up in ward so as to promote this innovation and make it an impressive innovation. Training materials, including the presentation slides and skills demonstration video will be stored in all computers in the ward and sent to every staff email account. Additionally, the presentation slides will be printed in hard copy and placed in nurse station. The easy accessibility of materials are important for this innovation and also promote accessibility for the information.

**Method**

A mobilization team will be set up for holding the entire pilot program. NC is the program director and she is responsible for coordinating different parties, communicating with staff and administration, handling problems or enquiries, giving support and offering help and finish the evaluation at the end of the innovation. She will monitor the progress of the entire program and have the right to terminate the innovation. Besides, 3 advanced practice nurses (APN) and 7 stroke nurses will be the team members. They are responsible for introduction and information sessions, training courses, promotion, collecting data and feedback, preparing materials and helping NC to finish the evaluation. Moreover, there should have two team members to monitor staff compliance of the guideline and correct mobilization skills in each shift. No extra manpower is needed as there is enough team members to share the duties.
Organizational climate

The organizational climate is very supportive to EBP guideline. Firstly, Hospital Authority welcome all EBP findings. Staff are welcomed to present their EBP findings in annual Hospital Authority Convention. Secondly, the department would hold EBP seminars to introduce new EBPs and implement. It also sponsor staff to join EBP seminars outside and encourage them to present their EBP findings. Thirdly, the administration fully support EBP guideline. Chief of Service (COS), Department Operation Manager (DOM), Ward Manager (WM) and NC all value EBP as they think this is an important and reliable way to improve current practice and raise the standard of nursing care. Thus, they all approve the implementation of this innovation. Furthermore, the ward climate is very positive to EBPs. NC would work with Consultant, Associate Consultant (AC) and stroke nurses to do evidence-based researches. The medical officers (MO) are supportive as well. Intra-arterial (IA) thrombectomy is a successful previous experience. Neurologists have done a systematic reviews on IA thrombectomy and introduced to related departments, including Accident and Emergency Department, Radiology, Intensive Care Unit and our ward. All are cooperating well and many positive feedbacks have received. This EBP guideline has introduced to MOs and they all support it. Additionally, nurses in this ward are open-mind to EBP. 60% of nurses have obtained or studying Master degree. They all agree and believe that EBP guideline is important. They are willing to carry out EBP guideline. Therefore, there is not many
opponents or uncooperativeness among health professional staff. All of these show that implementing EBP guideline in this ward is feasible as there is full of support.

Availability of resource

For human resources, physiotherapists (PT) will be invited for practical sessions to demonstrate the correct mobilization skills. PT department is contacted and they are willing to deliver the sessions. Besides, total two agency HCAs need to be employed. For the equipment, more geriatric chairs are needed for patients to sit out of bed. Moreover, for the training course, an activity room, a computer with a projector and screen, PowerPoint, printers, A4 papers, posters and seats are needed.

The effectiveness of the EBP guideline will be evaluated into two parts. For clinical outcomes, mobilization time and activities, patients’ functional status, walking ability, depression level, immobility complications, duration of hospital stay and quality of life will be evaluated. For the staff, mobilization skills and compliance to the guideline will be assessed by NC and other team members. All the measuring tools are available and can be found in hospital manual. Comments from staff and patients throughout the whole program will be collected and take into consideration for modifying the EBP guideline.
3.3 Cost-benefit ratio of the innovation

The potential benefits of this EBP guideline is improving walking ability, functional status and quality of life of stroke patients, minimizing their depression level, immobility complications and duration of hospital stay. All these will reduce the healthcare expenditure. The saved cost can be used to purchase more and better medical equipment and improve the ward environment, which in turn benefit both patients and nurses. If positive clinical outcomes are resulted and the program is carried out successfully, confidence of patients and staff will be boosted up. Patients will be more satisfied and trusted with therapeutic nursing care. Job satisfaction and morale of nurses and quality of nursing care will be enhanced. Nurse-patient relationship can be improved. It can be set as a good example and the experience can be shared to other wards, departments and hospitals. The atmosphere of EBP can be stronger, leading to an easier pathway of carrying out future EBP guideline.

Someone may afraid that early mobilization will worsen patients’ condition and the incidence rate of fall will increase. Bernhardt et al. (2015) reported that there were no significant results on the number of non-fatals serious adverse events, neurological serious adverse events and number of deaths. In addition, Bernhardt et al. (2008) stated that there was no significant difference in deterioration of condition on the first 7 days of stroke and in the incidence of falls 3 months after stroke between intervention and control group. Moreover, it reported the number of death and adverse events at 3 months did not have significant difference between
groups. Level of exertion after treatment was of no significant difference neither. As a result, those worries should be ignored and early mobilization is safe to patients.

The cost required for implementing this EBP guideline are calculated into two aspects: material cost and nonmaterial cost. For material cost, it is mainly for buying geriatric chairs. There are 10 geriatric chairs in the ward at present. Given that there are five cubicles and four patients need to sit out in geriatric chair in each cubicle, 10 more geriatric chairs are needed. With reference to the price list of the manufacturers, each chair cost $5000 and thus cost $50000 in total. Since the equipment and stationary are already available for the training course, the only cost will be poster printing. Four A2 size posters are needed and each cost $17. Thus, total poster printing cost is $68. As geriatric chairs can be used for many years, there is no annual material expenditure for implementing this innovation. Total material cost is $50068.

For nonmaterial cost, it is mainly for manpower. Three physiotherapists of 5 years’ of experience will be invited for holding two practical sessions. 25 registered nurses need to attend the training course while 9 HCAs and two agency HCAs need to attend practical sessions. Total nonmaterial cost for this pilot program is $9100. Since the two agency HCAs are for long term, the nonmaterial cost per year is $264 000. After calculation, the set-up cost
is $59168 and the running cost per year is $264 000. (Details in Appendix 4)

3.4 Evidence-Based Practice Guideline

The results and suggestions of the five selected studies are being summarized and synthesized in developing the recommendations of the EBP guideline. The recommendations are graded according to Scottish Intercollegiate Guidelines Network (2012). All the recommendations are graded as ‘A’ as all the five studies are well conducted RCTs and had a low risk of bias. Besides, patients’ characteristics and settings in all studies are highly similar to the target clients and settings in this guideline, making the recommendations highly applicable. (Details in Appendix 5)
Chapter 4: Implementation Pan

4.1 Communication Plan

In order to implement the guideline, stakeholders should be identified first. A communication plan is then developed according to the levels of those stakeholders.

Stakeholders

Stakeholders are prioritized into three levels, which are administrative level, managerial level and operational level.

For administrative level, it includes Chief of service (COS), Department Operation Manager (DOM), Medical Consultant, Nurse Consultant (NC) and Ward manager (WM). It is necessary to get approval and support from all of these administrators for implementing this guideline. They all have the authority to manage the whole project. They can decide if the project can be continued or terminated under which circumstances.

In managerial level, there are Advanced Practice Nurses (APN) and stroke nurses. They are appointed by DOM and NC to be the mobilization team members. They are responsible for holding information sessions and training courses, promoting the guideline, preparing
resources, carrying out the pilot study, measuring outcomes, collecting data and feedback, monitoring project progress, monitoring nurses’ compliance of the guideline and helping NC to complete the evaluation. Communication in this level is important as their work are very crucial. They should be the one who are most familiar with the project. They should cooperate well so that everything are on the same track and are running step by step. They should pass the message clearly to the operational level so as to minimize misunderstanding and give them sufficient support.

All frontline nurses, Health care assistants (HCA) and physiotherapists (PT) belong to the operational level. PT is responsible for delivering the training courses. All nurses and HCAs are responsible for following the guideline and putting it into practice. Also, nurses have to assess and monitor patients’ conditions. Their compliance and cooperativeness towards this guideline is highly related to the success of this project.

**Communication process**

A comprehensive communication plan should be developed so as to run the project smoothly. It is based on the stakeholders mentioned above. The timeframe of the entire program is illustrated in Appendix 6.
Notifying the administrative level and obtaining their approval for this EBP guideline is in week 1 of this program as this is of utmost important. Approvals must be obtained from COS and DOM first as they are in top rank of the administrative level. Then, approvals from medical consultants, NC and WM will be collected. The proposal presented to the administrative level includes the affirming needs and objectives of the EBP guideline, significance of the literature results, projected program timeline, transferability and feasibility of the guideline, foreseeable clinical outcomes and cost and benefit.

After obtaining the approval, a mobilization team will be set up in week 2. NC will be chosen as the program director. Besides, DOM and NC will appoint 3 Advanced Practice Nurses (APN) and 7 stroke nurses to be the mobilization team members. Afterwards, in week 3 – 5, the team will do preparation. The team members will be assigned to different duties according to their wishes and abilities. They will have regular meetings to discuss and confirm the details of the entire program, including training courses, guideline promotion, materials preparation and allocation, pilot study plan, outcome measurements and evaluation period. Every team members must attend the meetings to familiar with the program background, project details and assessment tools in measuring the outcomes. In addition, they must attend a practical training session in order to assess frontline staff mobilization technique.
In week 6 – 8, introduction and information sessions, training courses and guideline promotion will commence. Any enquires about the guideline from all staff will be answered. While comments and suggestions will be collected and taken into consideration to optimize the guideline and gain support from the frontline staff. After all things are settled, the pilot study will begin in week 9 and will last for three months.

During the implementation of the pilot study, all the mobilization team members will supervise staff compliance of the guideline and correct their mobilization skills every shift. They will also provide onsite support if the frontline staff have any difficulties. Data and comments will be collected. Moreover, they will have meetings every two weeks to report any special observations and review the progress. After the pilot study, the mobilization team will conduct an evaluation session to assess the feasibility of the guideline and to see if anything needs to be modified. Then the team members will present the evaluation report of the pilot study together with the refined guideline to the administrative level. After one month of the evaluation period, the refined guideline will be implemented for six months. Team members will continue to monitor the progress and collect data using Data Collection Sheet (Appendix 7). Afterwards, there will be one month for doing the final evaluation and the results will be presented to the administrative level.
4.2 Pilot study plan

A pilot study is necessary needed prior to the actual implementation of the guideline. The aim of the pilot study is to inspect and verify the feasibility of this guideline implementation in real clinical setting. Data about the study will be collected and used for refining the guideline. Besides, unexpected problems and difficulties may arise throughout the pilot study. Getting to know the problems can let the program team to figure out the solutions in advance and minimize the uncertainties in actual implementation. As a result, the guideline can be carried out as expected and without large obstacles.

**Target population**

The recruited target population is based on the inclusion and exclusion criteria mentioned before. With reference to the admission rate in the target setting, the estimated sample size is 30 in this pilot study. Convenience-sampling method will be used for recruiting the sample size. The team members will be responsible for screening eligible subjects.

**Timeline**

The pilot study will commence in week 9 of the entire program (Appendix 6). Since the estimated sample size to be recruited is 30, it is projected to take two months for recruiting target population and trial of the guideline. Collection of data and feedback will take place at
the same time. Next, there will be one month for the program team will analyse the results,
prepare and present the evaluation report and the refined guideline to the administrative level.
Then the program team will have final preparation of the actual implementation after the
administrative level appraisal.

Outcomes

The following outcomes will be measured: (1) patients’ functional status (2) patients’
walking ability (3) number of adverse events resulting from early mobilization (4)
deterioration of patients’ conditions. On the other hand, satisfaction and compliance rate of
the frontline nurses will also be measured.

Data collection

All the mobilization team members are responsible for data collection throughout the pilot
study. First of all, they will screen cases every day according to the inclusion and exclusion
criteria to assess if patients are eligible for early mobilization. After obtaining consent from
eligible patients, the team members will start to collect their demographic data, diagnosis,
stroke severity, past medical history, pre-morbid status, baseline functional status and
medical conditions. During the trial of the guideline, team members will be on-site to monitor
the progress. They will assess nurses’ compliance and competency to the guideline and their mobilization technique. In addition, they will measure patients’ outcomes mentioned above and their post intervention medical conditions. They will also record down any problems observed, such as uncooperativeness of staff, insufficient manpower, and inappropriate mobilization time. Nurses have to document patients’ conditions after having the mobilization sessions and they have to observe change of patients’ conditions. They should decide whether to suspend the mobilizations sessions if patients’ conditions deteriorate and document the reasons clearly. Team members can offer help to nurses if they cannot decide. All these information will be collected. Furthermore, if frontline staff have any comments and suggestions towards the guideline, they are welcomed to report to the team members.

*Result analysis and evaluation*

All the data, clinical results and feedback gathered will be processed into analysis. The program director will be responsible for result analysis. It is essential that the intervention is safe and not harming patients and staff. Otherwise, it will be considered as not feasible. On the other hand, the whole team will discuss about the problems encountered and figure out the best solutions. They will modify the guideline according to the results and recommendations. All these will put into the evaluation report. Once the team have drawn the conclusion, they will present the report to the administrative level.
4.3 Evaluation Plan

Outcomes measured

To evaluate the actual implementation of guideline, different aspects of outcomes will be measured. There are three aspects of outcomes: patients, nurses and department.

Patients’ functional status and quality of life are the primary outcomes in this innovation. Functional status is measured by Barthel Index while quality of life is measured by AQoL. All team members are being trained to use the measuring tools and they have consensus on the measuring standard. Other outcomes include patients’ walking ability measured by RMA and walking 50 meters unassisted, patients’ perceived exertion after treatment measured by Borg Perceived Exertion scale. In addition, number of adverse events resulting from early mobilization, deterioration of patients’ conditions, duration of hospital stay, patients’ satisfaction level and mortality rate will also be measured.

For nurses’ aspect, training courses will be provided to them before the pilot study. The effectiveness of the training courses will be evaluated. Their compliance, competency and satisfaction of the guideline will be assessed. Furthermore, as the quality of nursing care can be raised, job satisfaction and morale of nurses will increase as they have more autonomy in
nursing care. Nurse-patient relationship will improve as patients have more confidence in and pleased with nursing care. All these will be evaluated.

In departmental aspect, costs and benefits of the program should be considered. Costs of this program consist of expenditure in employing agency HCAs, PTs for delivering the training courses and purchasing of geriatric chairs. While benefits will be more than expected. By improving patients’ functional status and shortening the length of hospital stay, the healthcare expenditure can be decreased. The saved cost can be used in other areas to provide better medical equipment and improve ward environment. Both patients and staff can enjoy and their satisfaction level will increase. The reputation of the department will increase. All these costs and benefits will be compared in the evaluation plan.

*Nature and number of target population*

The inclusion and exclusion criteria of recruiting the target population is the same as in pilot study. Convenience sampling method will be used as well. The demographic data, clinical characteristics and medical conditions of the target population will be reviewed. Additionally, mobilization team members will follow those patients who need to suspend the mobilization
sessions until they transfer out or discharge. Their clinical details will be recorded and reviewed.

Sample size of the target population is calculated using this online statistics program, http://homepage.cs.uiowa.edu/~rlenth/Power/. Take the result of a high quality RCT from the six selected studies (Chippala and Sharma, 2015), there was 11.8% increase in Barthel Index score after the implementation. Thus, to achieve 5% of two sided significance level and 80% of power, the sample size of the target population should be 79. The average attrition rate in the selected studies is around 20%. Subjects may decline the intervention, refuse to follow up or death. Therefore, the sample size is rounded up to 90 after counting the attrition rate.

Timing and frequency of measurements and evaluation

All the team members will monitor patients’ outcomes, nurses’ competency and compliance to the guideline throughout the actual implementation period. Barthel Index, RMA and walking 50 meters unassisted of patients will be measured prior to the intervention, upon discharge and at 3-month follow-up. Quality of life will be assessed before the intervention and at 3-month follow-up. All the data will be computerized.
Besides, in order to evaluate the program, satisfaction survey will be given to nurses upon the completion of the implementation period (Appendix 8). The satisfaction survey will also be given to patients when they discharge (Appendix 9). Furthermore, the effectiveness of the training courses will be evaluated. Nurses and HCAs have to do return demonstration right after the practical sessions to ensure they have acquired the correct mobilization skills. Additionally, nurses need to have quiz after the theoretical sessions so as to assess their knowledge acquired and their understanding towards the guideline. Last but not least, the costs and benefits of the department will be calculated when all items are round up. All of these results will be analysed by the program director when the implementation period is over.

The program director will hold biweekly evaluation meetings in the first two months of the implementation period to review the implementation process and discuss any special issues. If it is ongoing smoothly as planned, it will change to monthly meetings from the third month onwards.
Data analysis

Data analysis will be done within one month after the implementation period. The program director will analyse the data using Statistical Package for the Social Science (SPSS). Paired t-test will be used to compare patients’ outcomes before and after intervention. Descriptive statistics will be used to analyse patients’ demographic data, clinical characteristics, clinical results and other quantitative data. Mean and standard deviation will be used to present continuous data while number and percentage will be used to present categorical data.

Patients’ and nurses’ satisfaction survey will be presented using 5-point Likert scale (Likert, 1932). Descriptive statistics will also be used to analyse the results of these two surveys. 5% significance level and 95% confidence interval will be used to analyse all the descriptive statistics. Qualitative data, such as feedback, comments, suggestions and recommendations from administrative level, staff, mobilization team and patients will be gathered and presented in the evaluation report. Moreover, the estimated and actual expenditure for the whole program will be stated clearly in the evaluation report.

4.3 Basis for implementation considered as effective

If the following results can be fulfilled, this guideline is considered as effective. Firstly, functional status and walking ability of patients have improved. There is no significant increase in serious adverse events, such as falls, drop in Glasgow Coma Scale, drop in limb power. Also, there is no significant increase in mortality rate. Secondly, nurses’ compliance
of the guideline reach 90% and their satisfaction rate towards the program reach 75%.

Thirdly, to the department, this program is not over budget and no frontline staff or patient is being injured.

4.4 Conclusion

In conclusion, early mobilization within 24 hours of stroke onset in stroke patients is a feasible and practical EBP guideline. It will not harm the patients. Instead, it benefits patients, nurses and the department. Many patients are suffering from disability after stroke. This EBP guideline can give them a hope. Stroke does not equal permanent disabled. Stroke patients do have a chance to recover. Therefore, nurses should focus more in stroke patients’ early rehabilitation process. This EBP guideline will be a good start.
Appendix 1: PRISMA 2009 Flow Diagram

Records identified through database searching (n = 187) 

Records identified through other sources (n = 6) 

Records after duplicates removed (n = 188) 

Records excluded (n = 152) 
- No full-text articles 
- Irrelevant abstract and title 
- Unmatched inclusion criteria 

Records screened (n = 188) 

Full-text articles assessed for eligibility (n = 36) 

Full-text articles excluded, with reasons (n = 30) 
- not RCT, pilot studies only 
- match with exclusion criteria 
- inappropriate target group 

Studies included in qualitative synthesis (n = 6) 

Studies included in quantitative synthesis (meta-analysis) (n = 0)
Appendix 2: Table of evidence


<table>
<thead>
<tr>
<th>Study design (level of evidence)</th>
<th>Sample characteristics</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Outcome measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Single-blind - RCT - at 56 stroke units in five countries: Australia, New Zealand, Malaysia, Singapore, and the UK (1+)</td>
<td>- median age: 72.3</td>
<td>- Very early mobilisation group</td>
<td>- Usual care group</td>
<td>Intervention outcomes:</td>
<td>(a) Very early mobilisation: Median=18.5</td>
</tr>
<tr>
<td></td>
<td>- Intervention group: 72.3</td>
<td>- begin within 24 hours of stroke onset</td>
<td>- Usual care group</td>
<td>(b) frequency per person</td>
<td>Usual care: Median=22.4 (p&lt;0.0001)</td>
</tr>
<tr>
<td></td>
<td>- Comparison group: 72.7</td>
<td>- focus on sitting, standing, and walking (ie, out-of-bed activity)</td>
<td>- no out of bed activity within 24 hours of stroke onset</td>
<td>(c) daily amount per person (min)</td>
<td>(b) Very early mobilisation: Median=6.5</td>
</tr>
<tr>
<td></td>
<td>- 40% female &amp; 60% male</td>
<td>- result in at least three additional out-of-bed sessions to usual care</td>
<td>- Usual care group</td>
<td>(d) total amount per person (min)</td>
<td>Usual care: Median=3 (p&lt;0.0001)</td>
</tr>
<tr>
<td></td>
<td>- 67% have hypertension, 40% have hypercholesterolemia</td>
<td>- last for 14 days or until discharge</td>
<td>- Usual care group</td>
<td>Primary outcome:</td>
<td>(c) Very early mobilisation: Median=31</td>
</tr>
<tr>
<td></td>
<td>- 75% premorbid modified Rankin Scale = 0</td>
<td>- mobilization out of bed only if the patient’s blood pressure did not drop by more than 30 mm Hg of an upright position</td>
<td>- Usual care group</td>
<td>(1) a favourable outcome at 3 months after stroke</td>
<td>Usual care: Median=10 (p&lt;0.0001)</td>
</tr>
<tr>
<td></td>
<td>- 87% walk unaided</td>
<td>(n = 1052)</td>
<td>(n = 1052)</td>
<td></td>
<td>All are adjusted for age and stroke severity</td>
</tr>
<tr>
<td></td>
<td>- 81% is first stroke</td>
<td></td>
<td></td>
<td>(1) Hazard ratio=0.73 (95% CI=0.59–0.90) p=0.004</td>
<td>(1) Hazard ratio=0.73 (95% CI=0.59–0.90) p=0.004</td>
</tr>
<tr>
<td></td>
<td>- median National Institutes of Health Stroke Scale (NIHSS): 4-12</td>
<td></td>
<td></td>
<td>(2) Hazard ratio=1.04 (95% CI=0.94–1.15) p=0.459</td>
<td>(2) Hazard ratio=1.04 (95% CI=0.94–1.15) p=0.459</td>
</tr>
<tr>
<td></td>
<td>- 88% are ischemic stroke and 24% of them receive rtPA</td>
<td></td>
<td></td>
<td>(3) Odds ratio=0.83 (95% CI 0.64–1.07) p=0.143</td>
<td>(3) Odds ratio=0.83 (95% CI 0.64–1.07) p=0.143</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4) Incidence rate ratio=0.88 (95% CI=0.72–1.07) p=0.194</td>
<td>(4) Incidence rate ratio=0.88 (95% CI=0.72–1.07) p=0.194</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(5) Incidence rate ratio =0.92 (95% CI=0.62–1.35) p=0.665</td>
<td>(5) Incidence rate ratio =0.92 (95% CI=0.62–1.35) p=0.665</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(6) Incidence rate ratio =1.26 (95% CI=0.95–1.66) p=0.108</td>
<td>(6) Incidence rate ratio =1.26 (95% CI=0.95–1.66) p=0.108</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(7) Odds rate=1.34 (95% CI=0.93–1.93) p=0.113</td>
<td>(7) Odds rate=1.34 (95% CI=0.93–1.93) p=0.113</td>
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<tbody>
<tr>
<td>- single blinded - RCT - at the stroke unit of the Department of Neurology and Medicine of the University Teaching Hospital in Mangalore, India (1+)</td>
<td>- mean age=59.32 (SD=9.80) - portion of female to male similar - 74% are thrombotic stroke - 80% have hypertension, 60% have diabetes - 52.5% have moderate severity, NIHSS 8-16 - 52.5% premorbid modified Rankin Scale = 0</td>
<td>- received Very Early Mobilization (5-30 mins each day) and Standard Care (45 mins each day) treatment - have first mobilization within 24 hrs of symptoms onset - minimum two times per day for seven days or until discharge - Activities include: Sitting supported in bed, sitting unsupported out of bed, transfer along with assistance, roll and sit up, sitting without support, transfer feet on the floor, standing activities, walk- early gait and advanced gait activities (n = 43)</td>
<td>- received routine stroke unit care 45 mins each day, including the passive and active mobilization, correct positioning in bed, mobilization in bed, sitting balance activities, facilitation of limb and trunk control activities, education of patient and caregiver - for seven days or until discharge (n = 43)</td>
<td>(1) Functional status • Barthel index measurements were taken at admission as a baseline, at the end of seven days or at discharge and at the end of three months following the onset of stroke (2) Time to first mobilization (Hours) (3) Length of hospital stay (Days)</td>
<td>(1) a. Barthel Index change scores (discharge – admission) Mean=0.51 (p&lt;0.001) b. Change scores (3rd month follow up– admission) Mean=0.54 (p&lt;0.001) (2) Intervention group: Median=18 hours, IQR=16.62–19.75 Standard Care group: Median=30.5 hours, IQR=29.0–35 (p&lt;0.001) (3) Intervention group: Median=8 days, IQR=7–9 Standard care group: Median=10 days, IQR=8–12.75 (p&lt;0.001)</td>
</tr>
</tbody>
</table>

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</table>
| - single blinded                 | - mean age=74.7 (SD=12.5)  
- 46% are female  
- 42% have mild severity, NIHSS 1-7  
- 87% are ischemic stroke  
- 25% have prior history of stroke  
- 70% have hypertension and 28% have ischemic heart disease  
- 54% premorbid modified Rankin Scale = 0  
- 54% are smokers or ex-smokers  
- 51% are left-sided brain lesion | - Very Early Mobilization group (VEM group)  
- receive both very early mobilization and standard care  
- begin mobilization within 24 hours of stroke onset  
- aim of assisting patients to be upright and out of bed at least twice per day  
- last for the first 14 days after stroke or until discharge (n=35) | - Standard Care group (SC group)  
- Receive standard care only, no out of bed activities within 24 hours of stroke onset | Primary outcome:  
(1) walking 50 m unassisted (days)  
Assessments at 3 and 12 months after stroke  
Secondary outcomes:  
(2) independence in 10 everyday activities  
- Barthel Index  
(3) motor activity  
- Rivermead Motor Assessment | (1) Hazard ratio=0.523  
(p=0.032)  
(2) At 3 months,  
VEM odds ratio=11.24  
(p=0.008)  
At 12 months,  
VEM odds ratio=4.19  
(p=0.201)  
(3) At 3 months,  
VEM odds ratio=8.21  
(p=0.05)  
At 12 months:  
VEM odds ratio=9.62  
(p=0.024) |
| - RCT                             |                        |              |            |                 |             |
| - acute stroke units of 2 large hospitals in Melbourne, Australia (1+) |                        |              |            |                 |             |

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<tr>
<td>- single blinded RCT</td>
<td>- mean age=74.7 (SD=12.5)</td>
<td>- Very Early Mobilization group (VEM group)</td>
<td>- Standard Care group (SC group)</td>
<td>(1) Disability (good outcome as per modified Rankin Scale (mRS) 0-2)</td>
<td>(1) After adjusting for baseline variables (age, premorbid mRS score and NIHSS score), At 3 months, odds ratio=4.10 (p=0.05) At 6 months, odds ratio=4.17 (p=0.08) At 12 months, odds ratio=8.15 (p=0.01)</td>
</tr>
<tr>
<td>- acute stroke units of 2 large hospitals in Melbourne, Australia (1+)</td>
<td>- 46% are female</td>
<td>- receive both very early mobilization and standard care</td>
<td>- receive standard care only 6 days per week</td>
<td>(2) death at 3 months</td>
<td>(2) Absolute risk difference =12% (p=0.20)</td>
</tr>
<tr>
<td></td>
<td>- 42% have mild severity, NIHSS 1-7</td>
<td>- begin mobilization within 24 hours of stroke onset</td>
<td>- no out of bed activities within 24 hours</td>
<td>(3) significant difference in the total dose of mobilization between groups</td>
<td>(3) a. total dose of mobilization achieved: VEM group: median=167 minutes SC group: median=69 (p=0.003) b. median time to first mobilization after symptom onset: VEM: 18.1 hours, SC: 30.8 hours (p&lt;0.001)</td>
</tr>
<tr>
<td></td>
<td>- 87% are ischemic stroke</td>
<td>- aim of assisting patients to be upright and out of bed at least twice per day</td>
<td>- no out of bed activities</td>
<td>(4) number of adverse events at 3 months (not include death)</td>
<td>(4) a. serious adverse events: VEM=15, SC=14 (p=0.846) b. non serious adverse events: VEM=61, SC=76 (p=0.04)</td>
</tr>
<tr>
<td></td>
<td>- 75% is first stroke</td>
<td>- last for the first 14 days after stroke or until discharge</td>
<td>- if a patient randomized to VEM experience a blood pressure drop of &gt;30mmHg on attempting to mobilize, mobilization attempt would cease</td>
<td>(5) deterioration within the first 7 days according to the European Progressing Stroke Study definition</td>
<td>(5) deterioration between groups from day 0 to 7: VEM=8, SC=9 (p=0.78) (6) Similar proportions of patients in both groups reported excessive fatigue (Borg score &gt;13) VEM=28.6%, SC=23.3% (p=0.75)</td>
</tr>
<tr>
<td></td>
<td>- 70% have hypertension and 28% have ischemic heart disease</td>
<td>- if a patient randomized to VEM experience a blood pressure drop of &gt;30mmHg on attempting to mobilize, mobilization attempt would cease</td>
<td>- if this occurred on 3 consecutive attempts, patient would receive standard care (n=35)</td>
<td>(6) patients’ perceived exertion after treatment, measured by Borg Perceived Exertion scale</td>
<td>(7) observed increase in the delivery of mobilization to a random sample of stroke unit patients during the trial (contamination)</td>
</tr>
<tr>
<td></td>
<td>- 54% premorbid modified Rankin Scale = 0</td>
<td>- 54% are smokers or ex-smokers</td>
<td>(n=35)</td>
<td>(7) number of occasions patients randomized to VEM were prevented from continuing with the treatment due to 3 consecutive drops in systolic blood pressure &gt;30mmHg</td>
<td>(8) no evidence for an increase in the proportion of the day spent in activities (95% CI=0.06 to 0.02, p=0.32)</td>
</tr>
<tr>
<td></td>
<td>- 51% are left-sided brain lesion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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<tbody>
<tr>
<td>- single blinded - RCT - acute stroke units of 2 large hospitals in Melbourne, Australia</td>
<td>- mean age=74.7 (SD=12.5) - 46% are female - 42% have mild severity, NIHSS 1-7 - 87% are ischemic stroke - 75% is first stroke - 70% have hypertension and 28% have ischemic heart disease - 54% premorbid modified Rankin Scale = 0 - 54% are smokers or ex-smokers - 51% are left-sided brain lesion</td>
<td>- Very Early Mobilization group (VEM group) - receive both very early mobilization and standard care - begin mobilization within 24 hours of stroke onset - up to four times a day and continued 6 days a week for the first 14 days or until discharge - mobilization sessions were aimed at stimulating the use of affected limbs and antigravity musculature and could include sitting out of bed, standing tasks and walking to the toilet or shower</td>
<td>- Standard Care group (SC group) - Receive standard care only, no out of bed activities within 24 hours of stroke onset</td>
<td>Quality of life - Assessment of Quality of Life (AQoL) measured at 3 and 12 months (The 12-month time point was chosen as the main focus of this study because spontaneous stroke recovery is a long process. Results from the 3-month QoL assessment are not reported) - include 5 domains, illness, independent living, social relationships, physical senses, psychological well-being - independent living reflects physical functioning</td>
<td>At 12 months, - median overall AQoL score: VEM group: 0.32 SC group: 0.24 (p=0.17) - Adjusted quantile regression at the 75th percentile (higher QoL) revealed a significant group difference (t=3.10, p=0.003) - median domain score of independent living: VEM group=0.88 SC group=0.6, Mann–Whitney U-test indicated significance between groups (z=71.92, p=0.05)</td>
</tr>
</tbody>
</table>

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>- single blinded - RCT - stroke unit of the Department of Neurology, Akershus University Hospital</td>
<td>- mean age=76.4 (SD=9.4) - 48% are male - mean NIHSS score on admittance=7.7 (SD=4.9) - 83% are ischemic stroke - 33% have prior history of stroke - 75% have hypertension and 48% have hypercholesterolemia - 24% are current smokers - 35% are right-sided brain lesion</td>
<td>- mobilized within 24 hours of stroke onset (n=123)</td>
<td>- mobilized between 24 to 48 hours after stroke onset (n=123)</td>
<td>Good outcome (modified Rankin Scale score 0-2) at 3 months</td>
<td>a. median times from stroke onset to first mobilization: Intervention group: 10.5 hours (IQR 8.5–22.3) Control group: 35.8 hours (IQR 28.0–41.0) b. At 3 months of follow-up, 28 of 51 patients (54.9%) had a good Outcome. c. None of the variables (mobilization within 24 hours of admittance, age, sex, stroke risk factors, NIHSS score on admittance) had a significant association with good outcome at 3 months in the multivariate logistic regression model.</td>
</tr>
</tbody>
</table>
## Methodology Checklist 2: Controlled Trials

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


**Guideline topic:** A clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

<table>
<thead>
<tr>
<th>Key Question No:</th>
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</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. Yes</td>
</tr>
<tr>
<td><strong>1.2</strong> The assignment of subjects to treatment groups is randomised. Yes</td>
</tr>
</tbody>
</table>

- **1.3** An adequate concealment method is used.  
  Staff were trained to conceal the mobilisation protocol and group allocation.

- **1.4** The design keeps subjects and investigators ‘blind’ about treatment allocation.  
  Patients were unaware of their treatment group. Intervention staff were masked to treatment allocation. Outcome assessors and investigators involved in trial and data management were masked to group assignment.
<table>
<thead>
<tr>
<th>Section</th>
<th>Question</th>
<th>Answer</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>The treatment and control groups are similar at the start of the trial.</td>
<td>Yes</td>
<td>Baseline characteristics were similar between study groups</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the treatment under investigation.</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes</td>
<td>Favourable outcome as modified Rankin Scale scores of 0-2</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>Dropout rate is 8.6% which include 7.6% death rate.</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>Yes</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>Yes</td>
<td>at 56 stroke units in five countries: Australia, New Zealand, Malaysia, Singapore and the UK</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Section</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>How well was the study done to minimise bias? <em>Code as follows:</em></td>
<td>Acceptable (+)</td>
<td></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 that the overall effect is due to the study intervention?</td>
<td>Yes. The statistical power is 80%. The sample size is large and dropout rate is low. There is randomization, concealment method, intention to treat and blinding.</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>
</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>
</tr>
</tbody>
</table>

- Time to walking unassisted did not differ significantly between groups
- The proportion of patients who had non-fatal serious adverse events did not differ significantly between groups
- Fewer than 12% of patients in either group had a serious neurological complication, with no significant between-group differences.
- Although the case-fatality rate at 3 months was higher in the very early mobilization group, no significant difference was recorded between groups.
- The prespecified subgroup analyses of efficacy might provide a signal that patients with severe stroke and those with intracerebral haemorrhage had reduced odds of a favourable outcome by 3 months if treated with the very early mobilization protocol. Additional exploration of death in the subgroups also suggested that patients with intracerebral haemorrhage might be more susceptible to harm. However, there was no evidence of any interaction and the results should be interpreted with caution. This study was not powered to detect differences between these subgroups.
- We also noted that outcomes for patients receiving rTPA were no different to outcomes for those who did not receive that treatment. Hence, there is no evidence that early mobilization in this subgroup is harmful.
- No difference of immobility-related complications between groups.
Usual care clinicians started mobilization earlier each year, with the result that roughly 60% of patients receiving usual care had started out-of-bed therapy within 24 h of stroke onset. Whether this result was a consequence of contamination from the trial protocol is uncertain.

## Methodology Checklist 2: Controlled Trials

### Study identification

(Include author, title, year of publication, journal title, pages)


### Guideline topic

A clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

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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):

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<tr>
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<th>The only difference between groups is the treatment under investigation.</th>
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<th>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.95%</td>
<td></td>
</tr>
<tr>
<td>Section</td>
<td>Description</td>
</tr>
<tr>
<td>---------</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>
</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**

| 2.1     | How well was the study done to minimise bias?  
*Code as follows:*  
Acceptable (+) |
|---------|-----------------------------------------------|
| 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. The dropout rate is acceptable. There is randomization, concealment method, intention to treat and blinding. |
| 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.  
- Based on Barthel Index scores at discharge, 70% (28 of 40) of the patients in the Intervention group were independent in activities of daily living compared to 32.5% (13 of 40) of the Standard care group. At 3 months follow up 85% (34 of 40) patients of the Intervention group were independent in activities of daily living compared to 45% (18 of 40) patients in the Standard care group.  
- This trial showed that very early and frequent mobilization accelerated the return of the activities of daily living following acute stroke. |

**Does not apply**  
at the stroke unit of the Department of Neurology and Medicine of the University Teaching Hospital in Mangalore, India
# Methodology Checklist 2: Controlled Trials

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


**Guideline topic:** A clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

**Key Question No:**

**Reviewer:**

---

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>
</tbody>
</table>

| **1.2** The assignment of subjects to treatment groups is randomised. | Yes |
| Computer generated, blocked randomization procedures. Randomization was stratified by hospital site and stroke severity on the National Institutes of Health Stroke Scale (NIHSS) to reduce the likelihood of severity imbalance between groups. |

| **1.3** An adequate concealment method is used. | Yes |
| concealment with opaque envelopes were used |

| **1.4** The design keeps subjects and investigators ‘blind’ about treatment allocation. | Yes |
| blinded assessor took place at 7 and 14 days and 3, 6, and 12 months after stroke |

| **1.5** The treatment and control groups are similar at the start of the trial. | Yes |
| Baseline characteristics between groups were similar |

| **1.6** The only difference between groups is the treatment under investigation. | Yes |
### Section 1: Relevant Outcomes

1.7 All relevant outcomes are measured in a standard, valid and reliable way. | Yes | Walking 50m distance used in the Functional Independence Measure walking item and commonly marked out within hospital departments. Barthel Index, a valid and reliable measure of ADLs in stroke research, was used to assess independence in 10 everyday activities. Rivermead Motor Assessment gross function scale of 13 items was used to examine motor activity and has established reliability in stroke.

1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed? | Dropout rate is 26.76% which include 23.94% death rate.

1.9 All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis). | Yes

1.10 Where the study is carried out at more than one site, results are comparable for all sites. | Yes | the acute stroke units of 2 large hospitals in Melbourne, Australia

### Section 2: Overall Assessment of the Study

2.1 How well was the study done to minimise bias? | Acceptable (+)

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? | Though there is randomization, concealment method, intention to treat and blinding, the dropout rate is a bit high. This will affect the intervention effect.

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 most important finding was that stroke patients who received very early mobilization (VEM) in addition to standard stroke unit care were able to walk unassisted sooner than patients who received standard stroke unit care (SC) alone. One major clinical implication of this result is that walking sooner increases the likelihood of milder stroke patients being discharged from acute care directly to home rather than to a rehabilitation facility. Our data support this possibility: despite the VEM group having more patients with moderate to severe strokes than the SC group, length of stay in the acute care hospital was shorter for VEM than for SC patients (median 6 vs 7 days), and they were more likely to be discharged directly to home (32% vs 24%).
- It is also possible that the increased physical activity served to minimize the muscle loss and deterioration in cardiorespiratory function associated with bed rest and thus made walking 50 meters unassisted less demanding. A further possibility is that self-efficacy was enhanced, which gave the patient increased confidence in his or her own ability to walk.
- More VEM patients were independent in ADLs (Barthel Index) and motor function (Rivermead Motor Assessment) than SC patients. Taken together with the walking findings, this indicates that providing earlier and more intensive mobilization after stroke can accelerate the recovery of meaningful physical outcomes.
Age and stroke severity strongly influenced recovery, with younger patients and those with less severe stroke achieving greater functional independence.

**Methodology Checklist 2: Controlled Trials**

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

**Guideline topic:** A clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

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**Before completing this checklist, consider:**

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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):

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<td></td>
</tr>
<tr>
<td><strong>1.6</strong> The only difference between groups is the treatment under investigation.</td>
</tr>
</tbody>
</table>
| 1.7 | All relevant outcomes are measured in a standard, valid and reliable way. | Yes
Deterioration within the first 7 days according to the European Progressing Stroke Study definition. Patients’ perceived exertion after treatment was measured with the Borg Perceived Exertion scale. |
| 1.8 | What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed? | Dropout rate is 26.76% which include 23.94% death rate. |
| 1.9 | All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis). | Yes |
| 1.10 | Where the study is carried out at more than one site, results are comparable for all sites. | Yes
acute stroke units at 2 large teaching hospitals in metropolitan Melbourne, Australia |

### SECTION 2: OVERALL ASSESSMENT OF THE STUDY

| 2.1 | How well was the study done to minimise bias? Code as follows: | Acceptable (+) |
| 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? | Though there is randomization, concealment method, intention to treat and blinding, the dropout rate is a bit high. This will affect the intervention effect. |
| 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. | ➢ Very early treatment for acute stroke patients was both safe and feasible.
➢ At 3 months, there were significantly fewer non-serious adverse events experienced by patients in the VEM group.
➢ There was no significant difference in the total number of falls recorded up to 3 months after stroke. There was no difference in deterioration between groups from day 0 to day 7.
➢ After adjusting for baseline variables (age, premorbid mRS score, and NIHSS score on admission), it is significant that the odds of a good outcome appeared greater in the VEM group than the SC group at 12 months.
➢ There was no significant difference in deaths between the 2 groups, and the confidence intervals were wide.
➢ The absence of an upper age limit to trial participation was intentional, given that it was reasonable to expect that stroke patients, regardless of age, would be able to participate in simple walking and standing activity with the assistance of trained healthcare professionals. |
Methodology Checklist 2: Controlled Trials

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

Guideline topic: A clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

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<tr>
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**SECTION 1: INTERNAL VALIDITY**

*In a well conducted RCT study…*

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</tr>
<tr>
<td><strong>1.6</strong> The only difference between groups is the treatment under investigation.</td>
</tr>
</tbody>
</table>

- **Yes**
- **No**

- **Randomised controlled trial**
- **Controlled clinical trial**

---

**Using a computer-generated blocked randomisation procedure with stratification by stroke severity, to ensure that patients with mild, moderate and severe stroke were equally represented between groups**

- **Opaque envelopes were used to ensure group allocation was concealed.**

- **Participants were blind to their group allocation and all outcomes were assessed by a blinded assessor who was not affiliated with the participating hospitals.**

- **No significant differences between groups were found for any of the baseline characteristics.**
1.7 All relevant outcomes are measured in a standard, valid and reliable way. **Yes**
   Quality of life was measured using the Assessment of Quality of Life (AQoL) instrument, a generic health-related utility instrument.

1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed? **Dropout rate is 28.2% which include 23.94% death rate.**

1.9 All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis). **Yes**

1.10 Where the study is carried out at more than one site, results are comparable for all sites. **Yes**
   the stroke units of the Austin and St Vincent’s Hospitals, Melbourne, Australia

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

2.1 How well was the study done to minimise bias? **Acceptable (+)**
   *Code as follows:*

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? **Though there is randomisation, concealment method, intention to treat and blinding, the dropout rate is quite high, which will affect the overall effect of the intervention.**

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 results suggest that exposure to VEM in the acute stages of stroke may have some influence in improving overall Quality of Life (QoL) at 12 months, mostly in relation to independent physical function. The hypothesised beneficial effect of VEM on overall QoL, however, could not be confirmed.
   - It suggest that earlier and more frequent out-of-bed activity may lead to faster recovery of physical function after stroke.
   - It is also possible that the VEM group experienced greater psychological benefits than controls. Individuals in the VEM group spent more time with staff and this may have created a more supportive atmosphere. Such an environment may increase patients’ self confidence and motivation, setting up a positive experience that may influence long-term QoL perception.
**Sign Methodology Checklist 2: Controlled Trials**

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


**Guideline topic:** A clinical protocol of early mobilization within 24 hours of stroke onset in stroke patients

<table>
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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...**

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<td><strong>1.9</strong> All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
</tr>
</tbody>
</table>
1.10 Where the study is carried out at more than one site, results are comparable for all sites.

**Does not apply**
the stroke unit of the Department of Neurology, Akershus University Hospital

## SECTION 2: OVERALL ASSESSMENT OF THE STUDY

<table>
<thead>
<tr>
<th>2.1</th>
<th>How well was the study done to minimise bias? <em>Code as follows:</em></th>
<th>Low quality (-)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>2.2</strong> 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?</td>
<td>The effect is low. Although the dropout rate is low, the sample size is small. Moreover, intention to treat and concealment method is not sure even though there is randomization.</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>No results can be applied maybe due to small sample size.</td>
</tr>
</tbody>
</table>
| 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. | ➢ We did not find any adverse effect of beginning mobilization within 24 hours versus between 24 and 48 hours of admittance, but because of the small sample size, an adverse effect of early mobilization cannot be excluded.  
➢ The lack of association of any of the variables with the outcome also may be explained by the study’s small sample size.  
➢ We did not identify any significant predictors of good outcome 3 months post stroke. |
## Appendix 4

### Table of estimated material cost

<table>
<thead>
<tr>
<th>Items</th>
<th>Cost per one item</th>
<th>Quantity</th>
<th>Total cost (HK dollar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical chair</td>
<td>$5000</td>
<td>10</td>
<td>$50 000</td>
</tr>
<tr>
<td>Poster printing</td>
<td>$17</td>
<td>4</td>
<td>$68</td>
</tr>
<tr>
<td>Activity room, computers, projector, screen, PowerPoint, printers, A4 papers and seats</td>
<td>Hospital Provision</td>
<td>-</td>
<td>$0</td>
</tr>
</tbody>
</table>

Total material cost for pilot program: $50068

Total material cost per year: $0

### Table of estimated nonmaterial cost

Approximate salary of a 5-year experience Physiotherapist (PT) per month = $32000 = $190 per hour

Average salary of 25 Registered Nurses (RN) per month = $31000 = $188 per hour

Average salary of 9 Health Care Assistants (HCA) per month = $15000 = $85 per hour

Average salary of 2 agency HCAs per month = $11000 = $72.5 per hour

<table>
<thead>
<tr>
<th>Items</th>
<th>Cost per person</th>
<th>Quantity</th>
<th>Total cost (HK dollar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PT</td>
<td>$190 x 1 hour practical session x 2 sessions = $380</td>
<td>3</td>
<td>$1140</td>
</tr>
<tr>
<td>RN</td>
<td>$188 x 1.5 hour of training course = $282</td>
<td>25</td>
<td>$7050</td>
</tr>
<tr>
<td>HCA</td>
<td>$85 x 1 hour practical session = $85</td>
<td>9</td>
<td>$765</td>
</tr>
<tr>
<td>Agency HCAs</td>
<td>$72.5 x 1 hour practical session = $72.5</td>
<td>2</td>
<td>$145</td>
</tr>
</tbody>
</table>

Annual expenditure on hiring agency HCAs
$11000 x 12 = $132000

<table>
<thead>
<tr>
<th>Items</th>
<th>Cost per person</th>
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<tr>
<td></td>
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Total nonmaterial cost for pilot program: $9100

Total nonmaterial cost per year: $264 000

Total set up (material + nonmaterial) cost: $59 168

Total running cost (hiring 2 agency HCAs) per year: $264 000
Appendix 5

EBP guideline

Early mobilization within 24 hours of stroke onset in stroke patients

Background

Every year, 15 million people suffer from stroke in the world with 5 million people die and another 5 million people left disabled permanently (World Health Organization, 2015). In Hong Kong, cerebrovascular disease is the fourth leading cause of death from 2003-2014. More than three thousand people die because of stroke each year (Department of Health, 2015). There are two main types of stroke: ischemic stroke and haemorrhagic stroke in which ischemic stroke is more common.

According to Hospital Authority (2015), the existing guideline does not say whether to keep bed rest or allow mobilization after patients are admitted for stroke. There is no protocol stating when stroke patients can start mobilizing. The current and usual practice is that stroke patients should remain bed rest after hospitalised. The doctors would decide when patients can mobilize. It is common that doctors always forget to order when to mobilize as this is not their main concern. After patients admitted for stroke, they would often stay in bed for few days after admission. This would cause them to have high risk of developing immobility related complications (Keating, Penney, Russell & Bailey, 2011). Around 85% of stroke patients would develop complications and immobility account for nearly 51% of death in the first 30 days of stroke onset (Bernhardt, 2008). As a result, studies had been done on early mobilization in stroke patients in order to prevent these complications and problems and improved walking ability. It is now highly advised that stroke patients should mobilize as early as possible in case their clinical conditions allow (Askim et al., 2012; Indredavik, 2009; Bernhardt, 2008; Intercollegiate Stroke Working Party, 2008; National Institute for Health and Clinical Excellence, 2008; Department of Health, 2007; as cited in Keating et al., 2011).
**Goal:** To improve functional status and walking ability of stroke patients

**Target users:** All nurses working in combined neurology and neurosurgery ward

**Target population:** Both ischemic and hemorrhagic stroke patients who are admitted within 24 hours of stroke onset, including those patients who have received rTPA treatment.

**Exclusion population:** patients who are in moderate to severe disability or are in unstable medical conditions

**Methodology:**
A search of literatures was carried out in two electronic databases in August to October 2015. They are PubMed and CINAHL Plus. The searching keywords were ‘Stroke’, ‘Early mobilization’, ‘Early mobilisation’. All the keywords were used in the two databases. Six articles were chosen as eligible studies and all of them were RCTs. Scottish Intercollegiate Guidelines Network (SIGN) was used as a tool to assess the methodology of the studies. All studies were in high methodological quality. All of them can reach the level of evidence 1+. The following recommendations were extracted from the six selected studies. Each recommendation is assessed using the GRADE system developed by Scottish Intercollegiate Guidelines Network (SIGNS, 2012c).
**Guideline:**

**Recommendation 1:**

**Eligible patients for early mobilization should age 18 or above, can be first stroke or recurrent stroke, ischemic or haemorrhagic stroke including those received rtPA. The only not eligible one is subarachnoid haemorrhage.**

Grade of recommendation: A

Evidence: All studies have clearly stated eligible patients for early mobilization should be 18 years old or above, can be either first or recurrent stroke, ischemic or haemorrhagic stroke. Only Bernhardt et al. (2015) further stated it included rtPA patients and patients suffer from subarachnoid haemorrhage were excluded. (Bernhardt et al., 2015) [1+] (Chippala and Sharma, 2015) [1+] (Cumming et al., 2011) [1+] (Bernhardt et al., 2008) [1+] (Tyedin et al., 2010) [1+] (Sundsethet al., 2014) [1+]

**Recommendation 2:**

**Eligible patients for early mobilization must be in stable medical condition and pre-morbid must not be in moderate disability.**

Grade of recommendation: A

Evidence: If patients meet any one of the following conditions, they are not suitable for early mobilization: pre-morbid levels of disability (modified Rankin Scale score >2, indicating moderate disability, require some help to walk unassisted), deteriorated within the first hour of admission to the hospital, direct admission to the intensive care unit, documented palliative treatment, immediate surgery, another serious medical illness or unstable coronary condition, no response to voice, systolic blood pressure lower than 110 mm Hg or higher than 220 mm Hg, oxygen saturation lower than 92% with oxygen supplementation, resting heart rate of less than 40 beats per min or more than 110 beats per min, temperature greater than 38·5°C, lower limb fracture or enrolment in another intervention trial. (Bernhardt et al., 2015) [1+] (Chippala and
Recommendation 3:

Mobilization activities must be upright and out of bed, any activities staying in bed are not counted.

Grade of recommendation: A

Evidence: Bernhardt et al. (2015) [1+] focused on sitting, standing, and walking activity. The aim of mobilization activities is assisting patients to be upright and out of bed in three articles, Chippala and Sharma (2015) [1+], Cumming et al. (2011) [1+], Bernhardt et al. (2008) [1+]. Chippala and Sharma (2015) stated the activities were sitting unsupported out of bed, transfer along with assistance, roll and sit up, sitting without support, transfer feet, on the floor, standing activities, walk- early gait, and advanced gait activities. Tyedin et al. (2010) [1+] aimed at stimulating the use of affected limbs and antigravity musculature. Activities included sitting out of bed, standing tasks and walking to the toilet or shower. Sundsethet al. (2014) [1+] focused on out of bed activities.

Recommendation 4:

Minimum frequency of mobilization session is two times per day and is continued for first 7 days of stroke, together with standard care treatment.

Grade of recommendation: A

Evidence: Bernhardt et al. (2015) [1+] had at least three additional out-of-bed sessions to usual care and was last for 14 days or until discharge from stroke-unit care. Chippala and Sharma (2015) [1+] stated the time spent on early and frequently out of bed activities was determined by the patient’s tolerance (5-30 minutes) plus 45 minutes of standard care treatment. They received mobilisation minimum two times per day for seven days or until discharge. Mobilization sessions in Cumming et al. (2011) [1+] and (Bernhardt et al., 2008) [1+] were at
least twice per day, thereby doubling the standard care “mobilization dose”. It lasted for the first 14 days after stroke or until discharge from the acute stroke unit. In (Tyedin et al., 2010) [1+], mobilization was up to four times a day and was continued 6 days a week for the first 14 days or until discharge.

**Recommendation 5:**

**Patients’ physiologic condition must be monitored closely before each mobilization on the first 3 days of stroke.**

Grade of recommendation: A

Evidence: Cumming et al. (2011) [1+] and (Bernhardt et al., 2008) [1+] stated patients’ blood pressure, heart rate, oxygen saturation and temperature should be monitored before each mobilization within the first 3 days of stroke.

**Recommendation 6:**

**Mobilization must be suspended if patients’ blood pressure drop by more than 30mmHg in an upright position. If this happens for 3 times consecutively, patients must stop all out of bed activities.**

Grade of recommendation: A

Evidence: Bernhardt et al. (2015) [1+] stated patients should mobilized out of bed only if the their blood pressure did not drop by more than 30 mmHg on achievement of an upright position. (Bernhardt et al., 2008) [1+] stated should a patient randomized to early mobilization experience a blood pressure drop of 30 mmHg on attempting to mobilize, the mobilization attempt would cease. If this occurred on 3 consecutive attempts, the patient would receive standard care thereafter (i.e no out of bed activities).
## Appendix 6

### Timeframe

<table>
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<tr>
<th>Task</th>
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<td>Set up mobilization team</td>
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<td>Guideline promotion and staff training</td>
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<td>Pilot study and evaluation</td>
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</table>
XXX hospital
Data Collection Sheet

**Part I: Demography data**

Name:_______________________  Sex:______  Age:______  Body weight:________ (kg)

Stroke type/diagnosis:______________________  □ received rTPA treatment

First stroke/ Recurrent stroke, Stroke history:______________  NIHSS score:_______

Premorbid mRS score:______  Premorbid walking with/without aid

Baseline walking ability (after admitted)  □ independent  □ assisted  □ unable to walk

Risk factors □ Hypertension  □ Ischaemic heart disease  □ Hypercholesterolaemia

□ DM  □ Atrial fibrillation  Others:______________________________________

Smoking □ non-smokers  □ ex-smoker  □ smoker, amount:____________________

**Part II: Intervention**

1. Time to start mobilization after admission:____________ (hours)
2. Frequency of mobilization per day:____________________________
3. Amount of mobilization per day:_______________________________ (minutes)
4. Days of mobilization during hospitalized:________________________ (day)
5. Total amount of mobilization:_______________________________ (minutes)
6. Types of activity:______________________________________________
7. Terminate mobilization □ No  □ Yes, reason(s):______________________

**Part III: Outcomes**

1. Functional status (measured by Barthel Index):______________________
2. Walking ability (measured by RMA):______________________________
3. Walking ability (measured by walking 50 meters unassisted):________
4. Patients’ perceived exertion after treatment (measured by Borg Perceived Exertion scale):

____________________________________________________________

5. Quality of life and psychological well-being (measured by Assessment of Quality of life):

____________________________________________________________

6. Duration of hospital stay:_______________________________________
7. Deterioration of patient’ condition:_______________________________
8. Non-fatal adverse event(s):____________________________________
9. Fatal adverse event(s):_______________________________________
Appendix 8  
Nurse Satisfaction Survey

XXX hospital  
Nurse Satisfaction Survey

➢ To evaluate the effectiveness of the evidence-based practice guideline on stroke patients  
➢ Please circle the appropriate number that reflect your views. Your comments are valuable to us.

Years of experience in this ward: ___________  
Rank: ___________

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The information session is clear and easy to understand.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. The training session is useful and has refresh my mobilization skills.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. Return demonstration is useful in consolidating the skills acquired.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. I understand the rationale of applying the guideline into clinical area.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. The guideline is easy to follow and can apply in daily routine.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6. I am confident in carrying out the guideline.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>7. Daily routine is affected because of the guideline.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8. My colleagues are following strictly with the guideline.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>9. The mobilization team is helpful whenever I encounter any difficulties.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>10. Overall, I am satisfied with the implementation of this guideline.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Other comments/suggestions:
Appendix 9

Patient Satisfaction Survey

XX hospital

Patient Satisfaction Survey

➢ To evaluate the effectiveness of the new mobilization guideline on stroke patients
➢ Please circle the appropriate number that reflect your views. Your comments are valuable to us.

Age:___________       Sex:__________       Stroke Diagnosis:__________________________

<table>
<thead>
<tr>
<th>Items</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There were mobilization session at least two times a day.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>2. The mobilization activities has facilitated my rehabilitation process.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3. I want to return to walking as soon as possible in case my condition allows.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4. I cannot cope with the intensity of the mobilization activities.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5. I prefer more bed rest after hospitalized.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>6. The mobilization activities are not enough.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
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</tr>
<tr>
<td>7. Nurses monitor my condition before and after mobilization sessions.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>8. Overall, the mobilization activities are useful.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

Other comments/suggestions:
References


   http://www.ha.org.hk/visitor/ha_visitor_index.asp?Content_ID=10009&Lang=E NG&Dimension=100&Parent_ID=10004


