An evidence-based smoking cessation program for patients with cardiac diseases

By

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DECLARATION

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

Signed ..............................

CHAN LAI MAN
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Abstract of thesis entitled

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**Chan Lai Man**

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**Introduction**

In Hong Kong, heart disease is the third leading causes of death which kills over 6000 people per year. Smoking has long been reported as an important risk factor for major cardiovascular diseases such as myocardial infarct. As a result, the implementation of smoking cessation intervention can lead to a reduction of mortality risks and increase the quality of life for people with cardiac problems.

Hospitalization provides a valuable opportunities to promote smoking cessation since patients are forced into temporary abstinence and removed from smoking cues in smoke-free environment. However, this golden opportunity for smoking cessation receives limited
concern from the health care professionals since there is a lack of systematic smoking cessation strategy for them. Therefore, a systematic evidence-based smoking cessation program is necessary to maximize tobacco control for cardiac patients to achieve a better health outcome.

**Objectives**

This dissertation aims to devise an ongoing and consistent evidence-based smoking cessation program for hospitalized patients with cardiac disease. In this light, the objectives of this proposal include 1) formulating the clinical instructions on smoking cessations for patients during hospital stay and after discharge; 2) standardizing the nursing practices for smoking cessation; 3) Improving the smoking cessation rates and health outcomes of cardiac smokers.

**Methods**

A search of relevant research evidence was performed using the database PubMed, MEDLINE and CINAHL plus to identify studies which help cardiac patients to quit smoking. The quality of the identified studies was accessed by a valid methodology checklist and an evidence-based practice guideline was developed based on the aggregated findings extracted from the studies. The guideline was then evaluated in terms of its implementation potential and a communication plan, including a pilot testing was generated for process evaluation.
Lastly, an evaluation plan was constructed to evaluate the outcome effectiveness of the program.

**Results**

Five studies were identified and systematically reviewed. Evidence extracted from the selected studies were then critically appraised and an evidence-based practice guideline was developed which includes 1) a brief advice; 2) inpatient counseling of at least 30 minutes by trained counselors; 3) telephone follow-up counseling for at least 6 times over 2 months.

**Conclusion**

The newly developed smoking cessation program, which encompasses best research evidence into practice, is potentially appropriate for the health care professionals to provide smoking cessation interventions for the hospitalized cardiac smokers to achieve a better health outcomes.
CHAPTER 1: Introduction

Background:

Smoking is a major public health concern in the world (Fiore et al., 2000). According to the statistics of the World Health Organization (WHO) (2007), 47.5% of men and 10.3% of women are smokers which compromised approximately 1.25 million of the global population. Local survey identified that there were 707,900 daily and non-daily smokers in 2012, representing 11.8% of all persons aged 15 and over in Hong Kong and daily cigarettes smoking seems to be more common in middle-aged people (Census and Statistics Department, 2012). Undoubtedly, cigarette smoking has been the greatest avoidable factors for premature death and dysfunction in developed and developing countries. In fact, it had led to 5.4 million deaths in 2004 globally and over the course of the 20th century, it is estimated that the figures may rise to one hundred millions (WHO, 2008). It has also been reported as an important risk factor for major cardiovascular diseases such as myocardial infarct (Pipe, 1999) with around 30% of death from cardiac diseases are attributed to smoking (United States Department of Health and Human Services, 2008). In Hong Kong, heart disease is the third leading causes of death which kills over 6000 people per year (Department of Health, 2014). When compared with other secondary measures for disease prevention and management, the implementation of smoking cessation interventions results in greater reduction of mortality risks and
increasing the cost effectiveness for people with the cardiac problems (Goldman, Garber, Grover & Hlatky, 1996).

Hospitalization provides valuable opportunities to promote smoking cessation, since all hospitals are now smoke free and patients are forced into temporary abstinence and removed from smoking cues, usually experiencing the worst withdrawal symptoms during hospitalization (Emmons & Goldstein, 1992). Simultaneously, the severity of the illness forces smokers to be aware of the health consequence of smoking and motivates them to quit.

Within the inpatient environment, nurses are the primary caregivers who have regular contacts with the patients and this provides a golden moment to promote smoking cessation if nurses are aware of its importance and eager to implement smoking cessation measures. There are various effective interventions available to encourage smoking abstinence such as behavioral support, pharmacotherapy etc. Behavioral support ranges from minimal (e.g. brief advice, written materials) to more intensive (e.g. multisession counseling) while pharmacotherapy includes nicotine replacement therapy, varenicline etc. Although the working environment and the choice of interventions available provide an ideal opportunity to promote smoking cessation, the utilization of these interventions are still limited and poorly established.
Affirm the Need:

Smoking is inevitably the major modifiable risk factors for cardiac diseases. In fact, smoking cessation reduces mortality by 36% after 3-5 years for patients diagnosed with coronary event, decreases the chance of non-fetal myocardial infarct and re-hospitalization in smokers who quit after their initial cardiac events (Critchley & Capewell, 2003; Van Spall et al., 2007). A lower risk ratio (RR) of 0.74 for stroke, MI and death was also observed in quitters when compared to persistent smokers after acute coronary events (Chow, 2010).

Moreover, a reduction in mortality is significant after months of smoking cessation and the risk is similar to those who never smoked after 15 years of abstinence (WHO, 2007). Epidemiology studies identified that there is a clear link of smoking with adverse outcomes in patients with coronary heart diseases (Rea, Heckbert, Kaplan et al., 2002). Smoking is also associated with increased risk of thrombosis for patients undergoing coronary artery bypass surgery (Herlits, 2004) and percutaneous coronary intervention (PCI) (Goto, Nikolsky, Lansky et al., 2011).

In view of the fatal consequences of smoking and the related cardiac problems, smoking cessation is important for smokers with cardiac diseases. Hospitalization provides golden opportunities to initiate smoking cessation interventions since patients may aware the seriousness of their diseases and they are temporary prohibited to access tobacco products due to the smoke free environment. Nurses, as a primary health giver, should grasp this teachable
moment and provide effective smoking cessation measures to modify their health behaviors.

However, the lack of appropriate strategy for nursing practice fails to stop patients continue to smoke, leading to increased risk of recurrent cardiovascular illness and subsequent death (Gerber et al., 2009). In fact, study found that around two-thirds of hospitalized smokers with CHD would resume smoking within a year after discharge and half of them would smoke within 1 month (Reid et al., 2003). An on-going and consistent smoking cessation program is thus necessary to ensure a continuity of tobacco abstinence for the cardiac patients. In Hong Kong and mainland China, the smoking habits of patients admitting to hospital often receive a limited concern from the health care professionals and the provision of smoking cessation strategies with regular follow-ups are rarely usual nursing practices (Abdullah et al., 2006; Johnston et al., 2004).

This situation can be seen in my working place of the target hospital. It is a cardiac specialty admission unit in which patients diagnosed with acute cardiac problems such as MI are admitted for management. Our unit also provides per-operative care for patients undergoing cardiac surgeries including PCI, pacemaker insertion etc. There is a smoking cessation team in our hospital and trained nurse counselors are responsible to provide bedside counseling for the patients upon referral from the ward nurses. The team is also authorized to provide NRT for discharged patients. Unfortunately, the utilization rate of the smoking cessation services is low, especially in my unit. When patient is admitted to our ward, nurses
would perform initial assessment by completing a computerized nursing assessment form. This form includes patients’ socio-demographic data with their smoking habits recorded. The problem is that once patient is identified as a smoker, nurses seldom provide any brief advice nor understand the proper way to deliver cessation messages. Even worst is that there is a lack of systematic smoking cessation strategy which addresses any intensive behavioral interventions. Nurses are unaware of the smoking cessation services available in our hospital and they are confused about the referral system. As a result, smokers may miss this valuable chance to access the smoking cessation services and without any follow-ups, their smoking problems will be left unattended after discharge.

In fact, countries such as United Kingdom have developed guidelines in smoking cessation for cardiac patients (NICE, 2010). However, these guidelines do not specifically address hospitalized cardiac patients and identify the roles of nurses in smoking cessation. Hospital-initiated smoking cessation interventions are the gold standard for effective management of patients with cardiac diseases (Smith & Burgess, 2009). As frontline nurses, we have the responsibility to provide effective smoking cessation measures to our patients. For this reason, a systematic evidence-based smoking cessation program is needed in our unit to maximize the tobacco control for cardiac patients.
Objectives and Significances:

Among patients with cardiac problems, smoking cessation can lead to significant health benefits including reduction in mortality and morbidity; decrease the complication rate after cardiac surgeries etc. Since there is no specific smoking cessation guideline in our hospital, the objectives of this study are:

- To formulate the clinical protocols on smoking cessation for cardiac patients during hospital stay and discharge
- To standardized the nursing practices for the smoking cessation program
- To improve the smoking cessation rates and health outcomes of the cardiac smokers

This is done by reviewing and critiquing the relevant research studies on smoking cessation for hospitalized cardiac patients, summarizing the findings of the best available evidence, developing a systematic protocol to address the issue. The protocol will also be accessed for its implementation potential and evaluated for its effectiveness.

By introducing an evidence-based smoking cessation guideline in our target setting, nurses can follow the appropriate path to deliver effective smoking cessation interventions with follow-up support to the cardiac patients during their hospital stay and the smokers can receive immense health benefits from quit smoking. From a broader perspective, smoking cessation can lessen the burden of health expenditures in treating the adverse health
consequences of cigarette smoking and resources can be more effectively allocated to different health care services in Hong Kong.
CHAPTER 2 : Critical Appraisal

Search and Appraisal Strategies:

The search of relevant research evidence was performed using the database of PubMed, MEDLINE and CINAHL plus. The keywords used were (Smoking or Smoking cessation or quit*), (Heart Failure or Myocardial Infarct* or Coronary or Cardi*), Hospital*. The search would be limited to the years of 2005-2015 or within 10 years and clinical trials with full text available are reviewed. Reference lists of eligible studies and research reviews are also reviewed.

For the inclusion criteria, all types of clinical trials are included. The intervention should be started within hospital context and could be continued after discharge in outpatient situation. Those hospitalized smokers diagnosed with all kinds of cardiac diseases such as myocardial infarct, ischemic heart diseases etc. or undergo any cardiac intervention surgeries such as coronary bypass, pacemaker insertion etc. are considered.

For the exclusion criteria, smokers who were admitted due to psychiatric or substance abuse problems had been excluded. Participants aged less than 18 or pregnant were also exempted from the review.
Table of evidence was used to extract data in terms of the study type, patient characteristics, intervention, comparison, length of follow-up, outcome measures and effect size in order to facilitate the synthesis of the relevant information for the program.

In order to access the quality of the identified studies, a valid methodology checklist named SIGN was adopted. This checklist is developed by the Scottish Intercollegiate Guidelines Network in which research studies are accessed based on their methodology and specialized checklists were used for RCTs. The overall quality of each study was graded as High quality (++), acceptable (+) or low quality (o).

Results:

The period of search started from August 2015 to November 2015. PubMed, MEDLINE and CINAHL plus were used as the database for the search. By the use of the keywords stated in the previous section with the limitations of “clinical trial” and “10 years”, a total of 48 research articles were identified after duplications removed. Through accessing the relevance of the title, abstracts and identifying the study type with the inclusion/exclusion criteria, five full-text articles were accessed for eligibility and they are all quantitative synthesis for this review. Detailed information about the search results is presented in the PRISMA flowchart in Appendix 1.

Table of evidence for data extraction is provided in Appendix 2.
The five studies identified after the search are all randomized controlled trials (RCTs). One study was implemented in the Netherlands, one in the USA and three from the Canada dated from 2005-2014.

The participants involved in both studies were all inpatient. Four studies were taken place in the cardiology unit while one study involved general medical settings with patients of different diagnosis including cardiology (28% of the studied participants were admitted due to cardiac problems). For patient characteristics, three studies included majority of men ranged from 70-80% of the patients while two studies have comparable sex ratio (50-60% for men). The mean age of the patients ranged from 49-56 which is comparable to our target setting where most of the admitted patients are in middle-aged (40-60 years old). Four studies had mentioned the average cigarettes smoked per day of around 20-24 while one did not. Two studies had stated the mean hospital stay for the participants (7-9 days).

For the control groups, all studies involved minimal interventions or usual care which included a brief general advice on smoking cessation. This is also an available practice in our target setting. One study offered a counselling session of around 30 minutes and one study adopted the Ask-Advice-Refer strategy (Orleans et al., 2006) in the minimal interventions. Four studies had provided self-help materials such as informational brochure to the patients.

The treatment groups in both studies involved an intensive intervention with follow-ups. The intensive intervention included inpatient education and counseling with different duration.
The follow-ups vary between studies in terms of delivery methods and duration. Two studies involved face to face counseling visits with 6-12 sessions within 3 months. Three studies involved telephone counselling with 6-7 calls within 2-3 months. Counseling protocols from two studies were based on transtheroretical model (Prochaska & DiClemente, 1983) while two were based on Marlatt and Gordon’s relapse prevention model (1985).

Pharmacotherapies including NRT were provided in three studies for both groups while one study only offered to the treatment group. One study did not involve any pharmacotherapy in its investigation.

The length of follow-up for the reviewed studies ranged from 6-24 months. 7 days point-prevalence abstinence (PPA) was used by both studies as outcome measures which is considered to be a valid assessment of smoking abstinence (Velicer & Prochaska, 2004). Continuous abstinence (CA) was also used to investigate the treatment effects in some studies. These abstinence rate were measured either by self-reported or validated by various methods. Moreover, Chouinard & Ekstrand (2005) had reported a progression in stages of change in the transtheroretical model between the groups. In addition, Mohiuddin et al. (2007) had included hospital admission rate and mortality rate in its outcome measures. The effect size in both studies are expressed in terms of percentages, odd-ratio (OR) or chi-square test for comparison with p values or confidence interval (CI) provided.
The five studies were then appraised in order to ensure the quality of the evidence generated. The SIGN checklist for the appraisal is presented in Appendix 3.

According to the table of internal validity, both the studies got their subjects randomly assigned. Mohiuddin et al. (2007) adopted simple randomization without block assignment for subjects’ allocation. Chouinard & Ekstrand (2005) used cluster randomization in which subjects were randomly assigned into predetermined clusters of 3-6 subjects and the groups (treatment and control) were then randomly assigned in each of these clusters. Both the selected studies did not mention specifically the sampling methods for subject recruitment.

Three studies had adequate allocation concealment. Permuted blocks of 10 patients were selected by a computer random number generator in the studies of Smith, Corso, brown & Cameron (2011) and Smith & Burgess (2009). Chouinard & Ekstrand (2005) ensured the allocation concealment by using sealed envelopes. Two studies did not mention clearly about the concealment arrangement. Only the study by Chouinard & Ekstrand (2005) had done the blinding process during treatment allocation while three did not mention in the studies. The study by Smith, Corso, brown & Cameron (2011) did not blind the treatment assignment to the patients.

The treatment and control groups in both studies showed no significant demographic differences at the start of the trial and all treatment outcomes were measured in a standard, valid and reliable way. Some studies involved self-reported results while the others were
validated by biochemical testing such as urinary continence test (Chouinard & Ekstrand, 2005), carbon monoxide exhalation test (Chouinard & Ekstrand, 2005 & Mohiuddin et al., 2007), saliva cotinine level (Smith, Corso, Brown & Cameron, 2011) or proxy confirmation (Smith, Corso, Brown & Cameron, 2011 & Smith & Burgesse, 2009). The drop-out rates for four studies were less than 20% ranged from 4.3% to 19%. Chouinard & Ekstrand (2005) had a drop-out rate of 30% and this was due to the higher number of discontinued participants in the usual care group. In view of the drop-outs in the research process, subjects in both studies were analyzed in respect to their allocated group by intention to treat analysis.

Based on the SIGN checklist on the assessment of the involved researches, three studies are of high quality (1++) and two studies are of acceptable quality (1+). It is certain that the overall effects of the study outcomes are due to the intervention and the results generated can be directly applicable to the targeted groups and settings.

**Summary and Synthesis:**

The included five studies had investigated the effect of the intervention on the smoking cessation rate in the cardiac patients and the results concluded that the intervention groups can achieve a better smoking abstinence rate than the control groups in 6-24 months. The effect size ranged from 9.1% to 45% 7 days PPA in 6 months. Three studies had also investigated a prolonged effect on smoking cessation in 12-24 months (Smith, Corso, Brown & Cameron, 2011, Smith & Burgesse, 2009 & Mohiuddin et al., 2007) and it ranged from 5% to 24%
7 days PPA. In the study of Smith, Corso, Brown & Cameron (2011), the treatment group showed a rather insignificant result of 5% (42% vs 37%) with OR=1.23 (CI: 0.68-2.23) in 7 day PPA when compared with the control group. It was a study conducted within general medical settings in which various diagnoses were presented and there was a subgroup analysis of cardiovascular patients on smoking cessation rate. The reasons for the insignificant result may due to that this group of cardiovascular patients was the subgroup analysis of the whole studied population and thus the sample size was relatively low (92 vs 88). Besides, the drop-out rate was high (18.8%) and the patients were not blinded to the treatment. However, this study is still included in this review as the result is in line with the outcomes from the other studies and it may reflect the actual situation in Hong Kong that some cardiac patients are cared in the general medical settings rather than a specialty unit.

After the synthesis of the study results, a potential innovation of a systematic smoking cessation program is proposed for the cardiac patients admitted to the target hospital.

It should begin with the usual care that provides a brief general advice from the health care professionals (Berndt et al., 2014, Smith, Corso, Brown & Cameron, 2011, Smith & Burgesse, 2009, Mohiuddin et al., 2007 & Chouinard & Ekstrand, 2005). Self-help materials such as information brochure, pamphlets etc. could also be provided (Berndt et al., 2014, Smith, Corso, Brown & Cameron, 2011, Smith & Burgesse, 2009, Mohiuddin et al., 2007). Berndt et al. (2014) had adopted the “Ask-Advice-Refer” strategy in which patient’s smoking
habit was first accessed, then offered advice to quit and referred to a more intensive smoking cessation services like individual counseling.

After an initial contact with brief advice and information materials given, patients would be referred to the intensive inpatient counseling offered by the smoking cessation counselors. Both studies have supported the implementation of the inpatient counseling for the smokers. The counseling sessions involved were of different duration from 30-60 minutes. A dose-response relationship may be observed for the intensity of the counseling in these studies. In the study of Berndt et al. (2014), the counseling session lasted for around 30 minutes yield 8.7% more of smoking cessation rate when compared to the control. The rate increased to 11.3% with the counseling duration lasted an average of 40 minutes (Chouinard & Ekstrand, 2005). Smith & Burgesse (2009) achieved a higher abstinence rate of 18% with around 45-60 minutes of bedside education and counseling sessions involved. Smoking cessation rate may be directly related to the intensity of the inpatient counseling sessions and in order to achieve a better smoking cessation outcomes, the inpatient counseling sessions could be lasted for at least 30 minutes.

For effective smoking cessation, it is important to sustain the treatment after patient discharged. Both studies had investigated the conjoined effect of the implementation of post discharge follow-ups for the smokers. It was either face to face or telephone counseling with varying durations and intensities. For face to face counseling, Berndt et al. (2014) had
provided 6 sessions of 30-45 minutes of counseling with cessation rate of 8.7% while
Mohiuddin et al. (2007) had offered counseling of around 60 minutes on weekly basis for a
minimum of 3 months. The latter study had achieved a more significant of 45% of abstinence
rate when compared with the control. This may due to the design of the intervention that
counseling of around 12 sessions (weekly basis) with 60 minutes per session were offered in
the study when compared to 6 sessions of 30-45 minutes in Berndt et al. (2003). This
significant difference in the intensity of the interventions may contribute to the results
obtained. Although more smokers seem to benefit from more intense counseling, it is of
practical concern that the available hospital resources may not be able to satisfy this intensity
of the counseling sessions.

On the contrary, telephone follow-up counseling had achieved the smoking abstinence
rate from 3% to 18% in three research studies (Smith, Corso, Brown & Cameron, 2011, Smith
& Burgesse, 2009 & Chouinard & Ekstrand, 2005). The intensity of the telephone
intervention ranged from 6-7 calls of 5-10 minutes over 3 months. The main benefits of the
telephone counseling are easily accessible, low costs and time-saving. It is a convenient
measure to deliver smoking cessation messages to patients who are of limited mobility or
resistance to attend the individual counseling (Reese et al., 2006). As a result, it is practical
that discharge follow-ups with telephone counseling are feasible to be implemented in
smoking cessation program to achieve a significant abstinence rate and it is suggested that the telephone follow-ups could be done for 6-7 sessions within 2 months.

Throughout the inpatient and follow-up counseling sessions, both studies had adopted various cognitive and behavioral frameworks that facilitate the delivery of smoking cessation messages to the patients. In the studies of Smith, Corso, Brown & Cameron (2011) & Smith & Burgesse (2009), Marlatt and Gordon’s (1985) relapse-prevention model were used which stated that smoking behavior is specific to different situations. It is necessary to develop measures to increase smokers’ self-efficacy and these strategies must be personally relevant. Transtheroretical model (Prochaska & Diclemente, 1983), which proposed that behavioral modification involves stages of change, was used in Berndt et al. (2014) and Chouinard & Ekstrand (2005). The model signifies that people modifying their behavior often involves 5 stages and require multiple attempts to achieve the change. It stresses the importance of motivational strategies to increase people’s readiness to move to the next stage of change. Chouinard & Ekstrand (2005) had concluded that the inpatient smoking counseling with telephone follow-up could allow patients progress to ulterior stages of change at 6 months (OR: 3.32, CI: 1.35-8.17). Mohiuddin et al. (2007) included in the counseling sessions of behavioral modification training, social support and coping skills training etc. to address the psychosocial aspects of the smokers during the cessation process. It is suggested that these
cognitive-behavioral models could be incorporated in the smoking cessation program in order to maximize the effectiveness of the intervention.

The provision of pharmacotherapy (NRT) is available in my target hospital though the utilization rate is low. Four out of five involved studies had included NRT as their proposed intervention. The use of NRT should be encouraged in the cessation program in order to address the nicotine dependence of the smokers.

The smoking problems in patients with cardiac diseases raise a prompt concern since it is related to severe morbidity and mortality. Smoking cessation is thus necessary to promote a better quality of life for patients with cardiovascular problems. However, smoking cessation raises a limited attention in the nursing practice, especially within the inpatient environment. In my hospital, there is no any systematic smoking cessation program for the patients admitted, particularly those with cardiac problems. Nurses only take their role of recording patients’ smoking habits and rarely offer even a brief advice on smoking cessation. After searching and reviewing the available evidence, a systematic smoking cessation program is proposed for the cardiac patients. It encourages nurses to offer brief advice and deliver self-help materials. Inpatient counseling and post discharge follow-ups were then arranged in order to sustain their motivation and action to remain abstinence from smoking.
It is hope that nurses in our unit can follow this evidence-based smoking cessation pathway and provide the most effective interventions to promote a better quality of life for the cardiac patients.
The previous section has concluded that a systematic smoking cessation program which includes brief advice, inpatient counseling with discharge follow-ups is feasible for cardiac patients admitting to the acute hospital. In this chapter, the implementation potential of this innovation would be accessed in relation to the target setting and audience before transferring the evidence into practice guidelines. The program would be evaluated in terms of transferability, feasibility and cost-benefit ratio.

**Target setting and audience:**

The innovation will be implemented in an acute public hospital under the Hong Kong East cluster (HKEC). It is initiated in two adult general medical wards (One male and one female) which specialize in cardiology. They also act as sister wards to support cardiac patients discharged from coronary care unit (CCU) and there are total 49 beds from each ward. The most common causes of admission to the target wards are congestive heart failure (CHF), ischemic heart disease (IHD), cardiac arrhythmia and post cardiac surgeries rehabilitation. There is no any smoking cessation program distinctive for those cardiac patients in the target hospital.

The target audiences are daily or regular smokers of both sex with the age of eighteen or above admitting to the target wards due to cardiac diseases.
3.1 Transferability

Fit to proposed setting

All the five selected studies were carried out in well-developed western cultures. Although there are some differences between western and eastern cultures, the benefits of smoking cessation are universal and no disparity should be observed in the adverse consequence of continue smoking in the human beings. Besides, it is common in human nature that behavioral modification (e.g. quit smoking, diet controls) involves sequences of change in mindset and routines and as a result, the cultural differences would not affect the principle of the implementation of the innovation in the target settings. The smoking cessation interventions in the five selected studies were carried out in the acute hospitals in which nursing care were provided to the cardiac patients. This is consistent to our target setting in which cardiac patients were cared within the medical wards of the acute hospital. In addition, the target hospital has reached the international standards of the quality of health care system by securing the accreditation from the International Society for Quality in Health Care. (Hospital Accreditation, 2014). This proves that the quality standard of health care in the target hospital has matched with the settings in the selected studies.

Similarity of the target population

All the five studies involved cardiac patients admitting to the hospital due to the diagnosis as mentioned in the target setting of the previous section. Among those studies, four
started the smoking cessation intervention in specialty cardiac units (Berndt et al., 2014, Smith & Burgess, 2009, Mohiuddin et al., 2007 & Chouinard & Ekstrand, 2005) while one took place in general medical ward (Smith, Corso, Brown & Cameron, 2011). This situation is similar in Hong Kong as some patients with cardiac problems are treated in general medical ward rather than specialty units.

Since there is no any formal statistical report regarding the characteristics of the hospitalized cardiac patients in the target hospital, a datum was generated based on the demographics of the cardiac smokers admitting to the target wards from the previous years by general observation and it is approved by the hospital practice review broad. The mean age of patients from the selected studies ranged from 49-56 which is similar to the target setting where the majority of the hospitalized patients are middle-aged (40-60). The average cigarettes smoked per day were mentioned in four studies of around 20-24. This is comparable to the target audience which they smoke average of around one pack (20) per day. Two of the selected studies had stated the mean hospital stay of the participants (7-9 days). Similar data is also observed in the target setting in which the length of stay for the patients is around 6-10 days.

**Philosophy of care**

Smoking cessation is obviously one of the important missions of the global effort to ensure better quality of life for the people. In fact, the Hong Kong government has
continuously put effort to combat smoking since the enforcement of the anti-smoking legislation in 2007. As the frontline health care givers, it is necessary for us to safeguard the patients from the devastating consequences of cigarette smoking. Since there is no any systematic smoking cessation program within the target hospital, the philosophy of care underlying the proposed innovation is matched with the direction of the government and the Hospital Authority in promoting smoking cessation. Besides, the principle of the innovation is in line with the mission of the target hospital that “We excel in the provision of holistic people-centered quality care through love, dedication and teamwork” (PYNEH, 2015) since the proposed innovation is customized to provide holistic care of the target populations.

**Sufficient clients to benefit**

The target hospital is the largest acute hospital in the Hong Kong east cluster. Based on the ward datum, the admission rate of cardiac patients in a week for both the two target wards are 90 and around 80% of them are smokers (~70). As a result, the approximate numbers of the target client benefit from the innovation is 3360 in a year. Moreover, the outcomes of the smoking cessation is not only limited to the cardiac patients who attain a better health status, but also contribute to the family members of the smokers since there are well published evidences that second-hand smoke poses serious adverse health consequences such as cancers, stroke, heart attack etc. to people. Therefore, the implementation of the proposed innovation can allow sufficiently large number of clients benefit from it.
Implementation and evaluation times

The time frame of the proposed innovation involves two parts. For inpatient intervention, it includes a five to ten minutes of brief advice from the health care professionals and a bedside counseling of at least 30 minutes by trained counselors. For outpatient intervention, it involves telephone follow-ups of 6-7 sessions within 2 months after patients discharged. These follow-ups are carried out by trained counselors and each telephone call may last for 5-10 minutes. Follow-up calls are provided at 6 month upon discharge to access the smoking status of the clients and evaluate the effectiveness of the innovation. Before the implementation of the innovation, 6 nurses from the target wards and CCU are recruited and will receive a 3-days training courses regarding smoking cessation specialized for the cardiac patients. As a result, both the time required for the preparation, implementation and evaluation of the proposed innovation are adequate and reasonable.

3.2 Feasibility

Freedom to implement

The proposed innovation is purely led by nurses throughout the process. Nursing practices nowadays require a higher degree of autonomy from the nurses. As the professionals, nurses have acquired critical thinking skills during their trainings and they are able to make accountable judgments and decisions. As a result, nurses have the freedom to carry out the
innovation or terminate it if it is considered undesirable based on their professional judgments.

**Interfere with current staff functions**

Nurses from the target wards are now operating in five-day work schedule and there is an overlap of 2 hours between the morning and evening shifts. Manpower is usually sufficient at this time slot. It is suggested that the trained smoking cessation counselors can use this overlapped time to implement the inpatient counseling to the clients. Besides, it is a usual routine for the ward nurses to document the smoking status of the newly admitted patients and they just only use few more minutes to offer brief advice to the patients. Therefore, it is not a concern that the innovation would interfere with the current staff functions.

**Support from the administration and staff**

Evidence based practice is long been promoted in the nursing practice and hospitals from HA are strive to adopt the best research evidence into practice in order to improve the quality of care. The innovation, which selects the best research evidence into practice, is congruent with the hospital’s mission of providing an accountable, evidence-based and high quality of care to the public and this innovation is in line with the hospital’s philosophy of care. As a result, it is confident that the innovation will be supported by the administration and the organizational climate is conductive to research utilization.
It is no doubt that the health care professionals understand the importance of smoking cessation on patient’s health, especially the cardiac patients. It is long been a commitment for nurses to promote cessation advice during their routine care. In fact, nurses in the target settings sometimes would offer brief advice during patient assessment in admission procedures. As a result, there is a consensus among staff and administration that the innovation could be beneficial and should be tested.

Friction and resistance arise

Although the innovation is beneficial to the clients, friction and resistance may exist. Nurses may lack the appropriate skills and experience in providing brief advice and in-patient counseling. Besides, they may lack motivation to carry out the innovation since implementing a new practice may interfere with their busy working routines in acute ward settings.

Skills needed for the innovation

For effective implementation of the innovation, nurses must be equipped with the essential skills of smoking cessation counseling. In this way, professional training is required for the nurses in the target settings. We would collaborate with the smoking cessation clinic in the hospital and the HKU Smoking Cessation Counseling Training Centre to provide trainings on smoking cessation. Workshops and seminars will be arranged and participants will learn about the facts and adverse health consequences of smoking, treatment options and the
professional skills and different models of cessation counseling. These training sessions will last for 2-3 days and will not affect the daily routines of the nurses.

**Equipment and facilities required**

An interview room or a guest room is needed for inpatient counseling. Sometimes, it could be done along bedside in the ward. For discharge patient follow-up, a telephone system is needed for counseling calls.

**Tools for evaluation**

Self-reported 7 days point-prevalence abstinence (PPA) is the primary measurement of the clients’ smoking status in the innovation and it is proved to be a reliable measurement of smoking abstinence (Velicer & Prochaska, 2004). It provides valuable information to evaluate the treatment outcomes of the innovation. The Fagerstrom Test for Nicotine Dependence is also used during the interview session to access the nicotine dependence of the clients and aid in evaluation of the effectiveness of the innovation.

3.3 Cost-Benefit Ratio

**Potential risk**

The proposed smoking cessation program is mainly focused on the counseling intervention and behavioral modification, therefore, no specific harm is expected during the sessions. This is supported by the five studies reviewed for the program. One potential risk that may arise in the innovation is the effect of NRT on the clients. Since the use of NRT may
increase blood pressure, heart rate and myocardial contractility (Benowitz, 1988), cautions should be made especially in patients with cardiovascular diseases. In fact, studies have already demonstrated the beneficial effect of NRT on the cardiac patients (Kelvin et al., 2012 & Diana, William & William, 2012). In the innovation, the prescription of the NRT is ordered by the cardiologist to eligible cardiac patients and nurses are responsible to monitor the progress of the clients during telephone follow-ups. As a result, the risk of using NRT for the clients is low.

**Potential benefit**

1) **Clients’ benefit**

   The health status of the clients quitting smoking will be significantly improved and the risk of the most smoking related diseases such as cancer, stroke etc. will lower. Especially for cardiac patients, smoking cessation will lower the chance of recurrent myocardial infarct and the complication rates following cardiac surgeries. Self-images of the quitters may also be improved since they may look more energetic and feel more in control of themselves.

2) **Organizational benefit**

   Smoking cessation will lower the morbidity and mortality rates and in turn, decrease the admission rates of the target settings. This will significantly improve the financial and manpower burdens of the health care systems and resources could be more flexible to be
delivered in different areas of health care quality improvement. On the health care professionals’ perspectives, the cumulative pressure from their stressful routines will lower and these will improve the caregiver’s morale with increased sense of belongings.

Material costs of the innovation

The material costs needed for the innovation can be divided into four parts:

(i) Staff Costs

Within the program, the total time for each patient’s counseling will be around 2 hours (5-10 minutes brief advice, ~45 minutes inpatient counseling, ~70 minutes telephone calls).

Since the salary of the trained nurse counselor is around $200/hour and around 3300 clients will be included in the program for a year, the summative staff costs will be: $200 \times 3300 = $1320000

(ii) Training

Total 16 hours of training courses will be provided and the mean hourly paid for one trainer is around $300. 2 trainers will be invited and the total costs: $300 \times 2 \times 16 = $9600

(iii) Stationaries and photocopies

These include photocopies of the counseling reference guides, assessment and evaluation forms, telephone systems and stationaries: $3000

To sum up, the total material costs for the innovation in a year = $(1320000 + 9600 + 3000) = $1332600$
$1332600 = $403 per client.

Non-material costs

Since the inpatient counseling often carried out at the overlapped time slots between shifts, not much extra workloads are expected and nurses’ ward routines will not be affected. As a result, there is no concern on any negative impacts on staffs such as high turnover rate, low staff morale etc.

Risks and costs of not implementing innovation

Without the implementation of the innovation, it is expected that cardiac smokers will continue to smoke after discharge. The risks of recurrent cardiac events such as myocardial infarct will increase and this leads to elevated re-hospitalization rate for these active smokers. Since the cost per patient day for general inpatient in HA hospitals is $3830 and the mean hospital stay for the clients in the target wards is 6-10 days, the minimum expenditures for a patient would be around $23000. Therefore, the proposed innovation can significantly save the total expenditure of direct health care and allow a better allocation of valuable resources.

Evidence-Based Practice Guideline

After performing the critical appraisal of the selected five studies and thorough evaluating the implementation potential of the innovation, an evidence-based practice guideline is developed to bridge the gap between research evidence and clinical practices. The guideline is based on the evidence levels and grades of recommendations of the studies
ranked according to the SIGN guidelines (Scottish Intercollegiate Guidelines Network, 2015).

Details of the guidelines are attached on the appendix 4.
Chapter 4: Implementation Plan

The previous chapters have described the needs of the development of a systematic smoking cessation program for inpatient smokers with cardiac diseases. Five studies are identified and critical appraisal is done in order to provide the basis for the implementation of the program. The implementation potential of the evidence-based innovation is then accessed in terms of transferability, feasibility and cost-benefit ratio. An evidence-based practice guideline is finally developed for the health care professionals to promote smoking cessations for the target populations.

4.1 Communication plan with potential users

For smooth and effective implementation of the program, it is necessary to ensure a proper in-depth communication among the stakeholders to facilitate understandings. Since the implementation of new innovation often brings along challenges and changes, commitment and supports from the stakeholders are crucial. Effective communication allows the whole organization to move towards a common goal and renders feedbacks and inputs from the stakeholders. Friction is thus prevented and commitment is ensured during the change process.

Stakeholders

Before the development of an effective communication plan, it is necessary to identify
the stakeholders of the program. The stakeholders include medical chief of services (COS), department operation manager (DOM), ward managers (WM) from general medical and cardiac care unit (CCU), nursing officers (NO), all nursing colleagues in the target wards and the target patient populations of the program. Since we would collaborate with the smoking cessation clinic in the hospital to provide trainings for the recruited smoking cessation counselors, the head and counselors of the smoking cessation clinic would also be approached.

**Communication with WMs**

In order to initiate and sustain the program implementation, a general sanction among the administrative levels is important for the approval of the innovation. A top-down organization support is thus necessary for the effective implementation (Polit, 2012). Ward managers from the target wards and cardiac care unit are the first gatekeepers to be communicated since they are the efficient change agents to facilitate the implementation of evidence-based innovation in the ward settings (Gerrish & Clayton, 2004). Individual meetings with the WMs are encouraged and in order to obtain their support, the importance of the smoking cessation for the cardiac patients is emphasized and the benefits of the newly developed guideline are introduced. The feasibility and cost-effectiveness of the program are also discussed and the guideline will be refined based on the suggestions and uncertainties raised during the meeting.
Communication with DOM and COS

After the guideline is reviewed and gain support from the WMs, DOM is approached since he/she is the budget and policy gatekeepers of the department. During the formal meeting with the DOM, the feasibility and the estimated cost-benefit of the innovation are addressed. The guideline will then be amended based on the mutual agreement on the recommendations and will be presented during the meeting with the hospital practice review board.

Before any new practice or innovation is implemented in our department, it is necessary to be introduced and gain approval in the meeting with the review board. The members of the hospital practice review board include department Chief of Service (Medical), DOM, WMs from all medical wards, SNOs, NOs and nurse representatives. With the coordination by the DOM, the newly developed smoking cessation guidelines will be presented during the meeting. The importance, feasibility and cost effectiveness of the program will be addressed. Emphasis will also be placed on the research evidence that support the innovation and how this evidence-based guideline could fit into the target settings.

Communication with NOs and nursing colleagues

After the approval from the practice review board, 2 seminars will be launched to invite all nursing officers and colleagues from the target wards. During the seminars, the details of the programs are briefly introduced to ensure that the implementation of the guidelines will
bring immense benefit and the nurses have the freedom to carry out or terminate it based on their professional judgments. The briefing seminars will also focus on how the guideline be implemented in the 5-days working schedule with the least interference on the working routines and the participants are free to raise concerns or questions about the programs.

**Communication with smoking cessation clinic**

In collaboration with the smoking cessation clinic in the hospital, the selected nurses from the target wards will receive trainings on appropriate skills of smoking cessation. As a result, it is necessary to have a better communication with the smoking cessation clinic. During the meeting with the head of the clinic, the aims and objectives of the innovation are introduced and the contents of the trainings are discussed. Besides, we would clarify that the implementation of the program may assist the works of the clinic and therefore facilitate the division of manpower in smoking cessation.

**Communication with the target populations**

To promote the smoking cessation program in the target wards, posters and exhibition boards are placed in the main entrance and within the ward areas. They highlight the importance and the benefits of the program and introduce the components of the innovation. The program is also promoted during patient assessment by the ward nurses through brief advice and the smoking cessation counselors will approach the interested clients for the implementation of the program.
**Sustaining the change process**

It is important to ensure the innovation is evaluated and reviewed to sustain the effective implementation of the program during the change process. A steering committee, which includes the trained counselors, nurse representatives from the target wards and the author of the guideline is formed and the committee will hold regular meetings from 2 weeks after the initiation of the program and the subsequent every month. The purpose of the meeting is to review the guidelines, identify the difficulties and encourage case sharing in order to maintain the effective implementation of the innovation.

**4.2 Pilot study**

Pilot testing is an important step to ensure the newly developed guidelines is feasible to be implemented in the target settings by exploring any problems encountered before the innovation is implemented in a larger scale. It is a preliminary study to access the feasibility, costs and obstacles of the study design which allows modification for the subsequent full scale execution (Leon, Davis & Kraemer, 2011). As a result, the pilot study will be conducted in a setting similar to the target venue and to those who will eventually participate the innovation (Mckenzie, Neiger & Thackeray, 2009).

The pilot study will be carried out in one of the two target wards in the hospital for three months. Clients which fit to the eligible criteria of the program are recruited in the first month. As mentioned in the previous chapter, the monthly admission rate of the cardiac smokers in
the designated ward is 140. Assuming that half of them agree to participate the program, around 70 clients will take part in the pilot testing.

After obtaining the written consent for the smoking cessation program from the clients, the trained smoking cessation counselor will approach the candidates for inpatient smoking cessation counseling. Post-discharge telephone follow-ups will be conducted for at least 6 times over the subsequent two months in which smoking cessation counseling and evaluation of the patient’s smoking status are conducted during the phone calls.

At two weeks after the initiation of the pilot testing, an evaluation meeting will be held by the steering committee to access the feasibility of the innovation. Comments and recommendations from WM and DOM are also collected. The feasibility issues to be focused include feedbacks from the frontline nurses and patients, unexpected outcomes, compliance of staffs and patients, workflow of the program, budget usage and any obstacles raised during the implementation of the guideline. The steering committee meeting will then be held at the end of every month to monitor the progress of the program, keep tract of the feasibility issues and refine the guidelines based on the pilot study results.
Chapter 4.3 Evaluation plan

This chapter will introduce an evaluation plan for the smoking cessation program of the hospitalized cardiac smokers. The purpose of developing an evaluation plan is to determine the effectiveness of the program with respect to its desired outcomes. The plan will include the intervention outcomes, nature and number of clients, data collection and analysis. Criteria for program effectiveness are also introduced in the plan.

Intervention outcomes

Primary outcome: The primary outcome of the innovation is the smoking cessation rate of the target populations at 6 months after discharge.

Secondary outcomes: Several secondary outcomes are assessed in the plan.

1. The change in smoking behavior of the participants at 6 months after discharge in terms of

   i. daily cigarettes consumption

   Since some smokers may not usually quit smoking abruptly at once, reducing cigarettes consumption is one of the measures to minimize the harmful effects of tobacco smoking (Hughes, 2000). Although there is insufficient evidence to support the reduction of cigarettes consumption as the treatment goal in smoking cessation (Fiore, 2000), it is still an alternative strategy for target patients who are unable to stop smoking abruptly in
their first attempt. Therefore, a reduction in daily cigarettes consumption is one of the secondary outcomes of the innovation.

(ii) **The stage of readiness for change according to the Transtheoretical model.**

Just like other health behavioral modification, smoking cessation is considered as a process in which smokers’ readiness to change is an important element to achieve the ultimate goal of smoking cessation. The transtheoretical model (Prochaska & DiClemente, 1983) illustrates 5 stages of behavioral change which are the reflection of the individuals’ readiness to stop smoking. The stage of change can be adopted as an indicator for smoking cessation program evaluation (Rustin & Tate, 1993) and therefore, stage advancement is another secondary outcome of the innovation.

(2) **The knowledge level of the trained nurse counselors**

To ensure the competencies of the trained nurse counselors, their knowledge level regarding smoking cessation counseling are accessed regularly after the training and indicated as the secondary outcomes.

**Nature and number of clients**

**Eligibility criteria**

Current adult smokers admitted to the general medical wards diagnosed with cardiac diseases or after receiving cardiac surgeries.
Sample size calculation

After obtaining approval from the hospital practice review broad and the smoking cessation clinic of the target hospital, a statistic report regarding smoking cessation of the admitted patients is obtained. According to the figures in the report, around 20% of cardiac patients without receiving any interventions would quit smoking after discharge and it would act as a baseline measurement for the sample size calculation.

Using the software of the Java Applets for Power and Sample Size (Lenth, 2006-9), test for one proportion with power taken as 80% and level of significance taken as 5% are selected. It is expected that the innovation would increase the smoking cessation rate by 11% and as a result, null value (Po) is set at 0.2 and actual value (P) is set at 0.31 (0.2 + 0.11). A sample size of 113 subjects is obtained. Based on the five selected studies, the average drop-out rate of the participants is 15% and as a result, a total of 133 clients should be recruited.

Data measurement and collection

When patients are admitted to the target wards and identified as current smokers during routine patient assessment, brief advice will be given by the ward nurses. They will also introduce the smoking cessation program to the target patients. If they agree to participate the program, the trained nurse counselors will approach the participants. Baseline data are recorded with a structured questionnaire which composed of information including sociodemographic data (age, marital status, employment status and education level) and
smoking related characteristics (age to start smoking, daily cigarettes consumption, years of smoking, level of dependence and any quit attempts before). Participant’s stage of change is also accessed by the algorithm adopted from Chouinard & Robichaud-Ekstrand (2005) (Appendix 5) and each client will be classified into one of the five stages.

At 6 months after discharge, participants will be approached for follow up data measurements including self-reported smoking status and stage of change for evaluation.

The knowledge level of the nurse counselors will be accessed by the pre-test and identical post-test. The assessment used is a 9-item test generated by Matten et al. (2011) with established content validity and reliability (Appendix 6). It is given before and after the training in order to evaluate the change of knowledge level of the nurses.

**Data analysis**

Data analysis for the primary and secondary outcomes will be performed by the Statistical Package for Social Science (SPSS) version 19.

For the primary outcome, the smoking cessation rate of the participants at 6 months after discharge will be analyzed by using chi-square test with the level of significant as 5%.

Chi-square test will be performed to access the difference in proportion of cigarettes consumption between the baseline and at 6 months for patients who self-reported as smokers in follow-up assessment. For the stage of change, descriptive statistics will be performed to
evaluate the change of stage of readiness at the baseline and 6 months follow-up for the
smokers.

The change of knowledge level of the nurse counselors after the training will be analyzed
using paired t-test to access the effectiveness of the training.

Criteria for effectiveness

There are several criteria which determine the effectiveness of the program in response
to its primary and secondary outcomes and these criteria are supported by the evidence from
the reviewed studies.

Primary outcome: From the three reviewed studies that include brief advice, inpatient
counseling and telephone follow-ups, the smoking cessation rate ranged from 3-18% increase
when compared to control (Chouinard & Ekstrand, 2005; Smith & Burgess, 2009 & Smith,
Corso, Brown & Cameron, 2011). The highest rate of 18% achieved in Smith & Burgess
(2009) may due to extra times used in inpatient counseling (45-60 minutes). The lowest rate
of 3% observed in Smith, Corso, Brown & Cameron (2011) may due to the fact that it was a
subgroup analysis with only 28% of cardiac patients involved. As a result, a minimum
increase of 11% of smoking abstinence rate after the program at 6 months is considered
effective which based on the research evidence of Chouinard & Eksrand (2005).

Daily cigarettes consumption: Among those participants which continue to smoke after the
program, 40% of them would reduce their cigarettes consumption by 50% at 6 months. This
criteria is evidenced by the study of Chan et al. (2011). Although it is a study conducted in out-patient setting, the population involved is Hong Kong cardiac patients and the intervention is similar to our program which includes counseling and telephone follow-ups. Therefore, at least 40% of participants with reduced daily cigarettes use (<50%) is considered effective.

The stage of readiness for change: Based on the result of Chouinard & Ekstrand (2005), at least 40% of the participants would progress to ulterior stages of change at 6 months after the program.

Knowledge level of trained nurse counselors: It is expected that the scores of the post-test of nurse counselors would increase at least 1 mark after the training sessions when compared with the identical pre-test.
References:


Benjamin Cummings.


Appendix 1: PRISMA flowchart for the search

Records identified through Medline limited to “2005-2015” (n = 343)

Records identified through PubMed limited to “Clinical trial” and “10 years” (n = 62)

Records identified through CINAHL limited to “2005-2015” (n = 182)

Records after duplicates removed (n = 48)

Records excluded (n = 43)
Excluded by
1. Relevance of title and abstract (n = 38)
2. Study type (n = 0)
3. Inclusion criteria (n = 5)
4. Exclusion criteria (n = 0)

Records screened (n = 5)

Full-text articles assessed for eligibility (n = 5)

Full-text articles excluded, with reasons (n = 0)

Studies included in quantitative synthesis (n = 5)
## Appendix 2: Table of Evidence

<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Patient characteristic</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcomes measures</th>
<th>Effect size</th>
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</thead>
<tbody>
<tr>
<td>Berndt et al, 2014</td>
<td>Randomized Controlled Trial</td>
<td>From 46 cardiac wards in hospitals throughout Netherlands which provide cardiac nursing care</td>
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<td>- 73.1% are men</td>
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<td>- Mean age : 55.92</td>
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<td>- 85.7% diagnosed with ACS</td>
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<td>- Average cigarettes per day : 20.84</td>
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<td>UC + Face-to-face counseling (FC) plus NRT:</td>
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<td>- FC started within one week of recruitment and last 3 months (6 face-to-face sessions of 30-45 mins)</td>
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<td>- NRT provided to eligible patients (n = 157)</td>
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<td>- Counseling is based on transtheoretical model</td>
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<td>Usual care (UC):</td>
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<td>- Assessment of smoking behavior</td>
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<td>- Brief advice (Ask-Advise-Refer (AAR) strategy)</td>
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<td>- Occasionally the delivery of an informational brochure (n = 245)</td>
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<td>Self-reported smoking abstinence rates in terms of χ²</td>
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<td>A. Continued abstinence (CA)</td>
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<td>B. 7-day PPA</td>
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<td>FC vs UC:</td>
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<td>A. 3.44 (p=0.06) / +9.1% (40.6 vs 31.5)</td>
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<td>B. 3.04 (p=0.08) / +8.7% (43.2 vs 34.5)</td>
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<td>Smith, Corso, Brown &amp; Cameron 2011</td>
<td>Randomized Controlled Trial</td>
<td>From three community hospitals in southern Ontario</td>
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<td>- Mean age : 49</td>
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<td>- Average cigarettes per day : 20</td>
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<td>- 28% participants are diagnosed with cardiovascular diseases (n = 180)</td>
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<td>Brief advice</td>
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<td>- Inhospital education focuse on increasing self-efficacy to remain abstinence</td>
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<td>- Post-discharge 7 telephone counselling (5-10 minutes/call) (n = 92)</td>
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<td>- Counseling is based on Marlatt &amp; Gordon's relapse prevention model</td>
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<td>Brief advice (5 mins)</td>
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<td>- Review of two take-home pamphlets (n = 88)</td>
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<td>A. Self-reported 7 day PPA (General population)</td>
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<td>A.1) 3 month</td>
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<td>A.2) 6 month</td>
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<td>A.3) 12 month</td>
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<td>B. 12-month confirmed abstinence by CVD in Odd ratio (OR)</td>
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<td>A.1) + 8% (41% vs 33%) [95% CI : 1.02-1.97]</td>
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<td>A.2) +3% (34% vs 31%) [95% CI : 0.82-1.61]</td>
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<td>A.3) +3% (36% vs 33%) [95% CI : 0.80-1.56]</td>
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<td></td>
<td></td>
<td>B. 1.23 (CI: 0.68-2.23) / +5% (42 vs 37)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bibliographic citation</td>
<td>Study type</td>
<td>Patient characteristic</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Length of follow up</td>
<td>Outcomes measures</td>
<td>Effect size</td>
</tr>
<tr>
<td>------------------------</td>
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</tr>
<tr>
<td>Smith &amp; Burgess 2009 (1++)</td>
<td>Randomized Controlled Trial</td>
<td>From four cardiac units in a large urban hospital in western Canada</td>
<td>Minimal intervention + Intensive intervention:</td>
<td>Minimal intervention:</td>
<td>12 months</td>
<td>A. Self-reported 7 day PPA in Odds ratio (OR)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Mean age: 54</td>
<td>- 45-60 minutes of bedside education and counselling</td>
<td>- Advice to quit</td>
<td>A.1) 3 month</td>
<td>A.1) 2.0 (CI: 1.2-3.4) / +15% (76 vs 61)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Mean hospital stay: 9</td>
<td>- Take-home materials</td>
<td>- Review 2 pamphlets (how to quit and where to find help quitting)</td>
<td>A.2) 6 month</td>
<td>A.2) 2.0 (CI: 1.3-3.4) / +18% (67 vs 49)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 83% are men</td>
<td>- 7 telephone counselling sessions (5-10mins per call)</td>
<td>- Physician delivered a scripted nonsmoking message</td>
<td>A.3) 12 month</td>
<td>A.3) 2.0 (CI: 1.2-3.3) / +16% (52 vs 46)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Average cigarettes per day: 21.5</td>
<td>- +/- Pharmacotherapy</td>
<td>- +/- Pharmacotherapy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(n = 137)</td>
<td>(n = 139)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>* Counseling is based on Marlatt &amp; Gordon's relapse prevention model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bibliographic citation</td>
<td>Study type</td>
<td>Patient characteristic</td>
<td>Intervention</td>
<td>Comparison</td>
<td>Length of follow up</td>
<td>Outcomes measures</td>
<td>Effect size</td>
</tr>
<tr>
<td>------------------------</td>
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<td>------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td>----------------------</td>
</tr>
</tbody>
</table>
| Mohiuddin et al, 2007  | Randomized Controlled Trial | From coronary care unit at the university-affiliated teaching hospital in Omaha | Usual care + Intensive intervention:  
- Counselling with a trained tobacco cessation counselor (Around 60mins on weekly basis for a minimum of 3 months)  
- Individualized adjuvant pharmacotherapy (n = 109) | Usual care:  
- Inpatient counselling (for approximately 30mins)  
- Self-help materials  
- Individualized adjuvant pharmacotherapy (n = 100) | 24 months | A. Validated 7 day PPA & B. Continuous Abstinence  
1) 3 month  
2) 6 month  
3) 12 month  
4) 24 month | A) +54% (69% vs 15%)  
B) + 54% (69% vs 15%)  
At 1 3 months :  
A) +54% (69% vs 15%)  
B) + 54% (69% vs 15%)  
At 1 6 months :  
A) +45% (60% vs 15%)  
B) + 42% (55% vs 13%)  
At 1 12 months :  
A) +35% (47% vs 12%)  
B) +28% (39% vs 11%)  
At 1 24 months  
A) +30% (39% vs 9%)  
B) +24% (33% vs 9%)  
C. Relative risk reductions (RRR) at 24 months | A) 75% (CI: 67 - 84%)  
All with p < 0.0001  
D. Hospital admission rate (RRR) at 24 months  
E. Mortality rate of causes (RRR) at 24 months | D. +44% (CI: 16% to 63% / p=0.01)  
E. +77% (CI: 27% to 93% / p=0.026) |
<table>
<thead>
<tr>
<th>Bibliographic citation</th>
<th>Study type</th>
<th>Patient characteristic</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Length of follow up</th>
<th>Outcomes measures</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chouinard &amp; Ekstrand 2005 (1++)</td>
<td>Randomized Controlled Trial</td>
<td>From a cardiology unit within a regional tertiary hospital in the province of Quebec</td>
<td>Group 1: - Average 40mins of inpatient counselling sessions with family members included (n = 56) Group 2: - Same as group 1 plus telephone follow-up after discharge (6 phone calls over 2 months) (n = 56) - +/- NRT offered based on nicotine dependence and physical condition</td>
<td>Usual care: - General advice on smoking cessation (n = 56) - +/- NRT offered based on nicotine dependence and physical condition</td>
<td>6 months</td>
<td>A. Validated 7 day PPA at 6 months when compared with usual care group (OR): A.1) Group 1 A.2) Group 2</td>
<td>A.1) 1.56 (CI: 0.62-3.90) / +10.2% (30.2 vs 20) A.2) 2.75 (CI: 1.13-6.71) / +11.3% (41.5 vs 30.2)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Mean age: 55.9 - 73% are men - Average length of stay: 7.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group 1: - Average 40mins of inpatient counselling sessions with family members included</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Group 2: - Same as group 1 plus telephone follow-up after discharge (6 phone calls over 2 months)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- +/- NRT offered based on nicotine dependence and physical condition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- All inpatient counselling and telephone follow-up were based on transtheoretical model</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3 : SIGN checklist

Methodology Checklist 2: Controlled Trials

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


**Guideline topic:** An evidence-based smoking cessation program for patients with cardiac diseases

**Key Question No:** 1

**Reviewer:** Chan Lai Man

**Before** completing this checklist, consider:

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

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

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

### SECTION 1: INTERNAL VALIDITY

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

<table>
<thead>
<tr>
<th></th>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>The study addresses an appropriate and clearly focused question.</td>
</tr>
<tr>
<td>1.2</td>
<td>The assignment of subjects to treatment groups is randomised.</td>
</tr>
<tr>
<td>1.3</td>
<td>An adequate concealment method is used.</td>
</tr>
<tr>
<td>1.4</td>
<td>Subjects and investigators are kept 'blind' about treatment allocation.</td>
</tr>
<tr>
<td>1.5</td>
<td>The treatment and control groups are similar at the start of the trial.</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the treatment under investigation.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<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>19%</td>
</tr>
<tr>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes</td>
</tr>
<tr>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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

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

2.2 Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?
   Yes

2.3 Are the results of this study directly applicable to the patient group targeted by this guideline?
   Yes

2.4 **Notes.** Summarise the authors’ conclusions. Add any comments on your own assessment of the study, and the extent to which it answers your question and mention any areas of uncertainty raised above.
   Patients with intensive smoking cessation intervention were more likely to be abstinent from smoking six months after hospital discharge than those who received usual smoking cessation care. Blinding and allocation concealment were not mentioned in the study and the drop-out rates was relatively high.

   **Level of evidence:** 1+
Methodology Checklist 2: Controlled Trials

Guideline topic: An evidence-based smoking cessation program for patients with cardiac diseases

Key Question No: 1
Reviewer: Chan Lai Man

Before completing this checklist, consider:

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

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

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

SECTION 1: INTERNAL VALIDITY

In a well conducted RCT study...

Does this study do it?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>The study addresses an appropriate and clearly focused question.</td>
<td>Yes ☑ No □ Can’t say □</td>
</tr>
<tr>
<td>1.2</td>
<td>The assignment of subjects to treatment groups is randomised.</td>
<td>Yes ☑ No □ Can’t say □</td>
</tr>
<tr>
<td>1.3</td>
<td>An adequate concealment method is used.</td>
<td>Yes ☑ No □ Can’t say □</td>
</tr>
<tr>
<td>1.4</td>
<td>Subjects and investigators are kept ‘blind’ about treatment allocation.</td>
<td>Yes ☑ No □ Can’t say □</td>
</tr>
<tr>
<td>1.5</td>
<td>The treatment and control groups are similar at the start of the trial.</td>
<td>Yes ☑ No □ Can’t say □</td>
</tr>
<tr>
<td>1.6</td>
<td>The only difference between groups is the treatment under investigation.</td>
<td>Yes ☑ No □ Can’t say □</td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes</td>
</tr>
<tr>
<td>-----</td>
<td>-------------------------------------------------</td>
<td>-----</td>
</tr>
<tr>
<td></td>
<td>Can't say □</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>18.8%</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Can't say □</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Does not apply □</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>
</tr>
<tr>
<td></td>
<td>Can't say □</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 2: OVERALL ASSESSMENT OF THE STUDY

<table>
<thead>
<tr>
<th>2.1</th>
<th>How well was the study done to minimise bias?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Code as follows:</td>
</tr>
<tr>
<td></td>
<td>High quality (++)</td>
</tr>
<tr>
<td></td>
<td>Acceptable (+)</td>
</tr>
<tr>
<td></td>
<td>Unacceptable – reject 0 □</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.2</th>
<th>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?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.3</th>
<th>Are the results of this study directly applicable to the patient group targeted by this guideline?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes, since there is a subgroup analysis of cardiac patients</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2.4</th>
<th>Notes. Summaries 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.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The treatment group achieved the predicted abstinence rate in general participants but was not significantly higher than control. Subgroup analysis showed that cardiac patients had a higher odd ratio of 7 day PPA after receiving the interventions, though it is not statistically significant. This may due to the small sample size in cardiac subgroup, relatively high drop-outs and no blinding done.</td>
</tr>
</tbody>
</table>

|     | Level of evidence : 1+ |
**Study identification** *(Include author, title, year of publication, journal title, pages)*


**Guideline topic:** An evidence-based smoking cessation program for patients with cardiac diseases  
**Key Question No:** 1  
**Reviewer:** Chan Lai Man

**Before completing this checklist, consider:**

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

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

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

### SECTION 1: INTERNAL VALIDITY

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

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1</strong></td>
<td>The study addresses an appropriate and clearly focused question.</td>
<td>Yes □ No □</td>
</tr>
<tr>
<td><strong>1.2</strong></td>
<td>The assignment of subjects to treatment groups is randomised.</td>
<td>Yes □ No □</td>
</tr>
<tr>
<td><strong>1.3</strong></td>
<td>An adequate concealment method is used.</td>
<td>Yes □ No □</td>
</tr>
<tr>
<td><strong>1.4</strong></td>
<td>Subjects and investigators are kept 'blind' about treatment allocation.</td>
<td>Yes □ No □</td>
</tr>
<tr>
<td><strong>1.5</strong></td>
<td>The treatment and control groups are similar at the start of the trial.</td>
<td>Yes □ No □</td>
</tr>
<tr>
<td><strong>1.6</strong></td>
<td>The only difference between groups is the treatment under investigation.</td>
<td>Yes □ No □</td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
<td>Yes ☑</td>
</tr>
<tr>
<td></td>
<td>Can't say ☐</td>
<td></td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
<td>9.2%</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
<td>Yes ☑</td>
</tr>
<tr>
<td></td>
<td>Can't say ☐</td>
<td>Does not apply ☐</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
<td>Yes ☑</td>
</tr>
<tr>
<td></td>
<td>Can't say ☐</td>
<td>Does not apply ☐</td>
</tr>
</tbody>
</table>

## SECTION 2: OVERALL ASSESSMENT OF THE STUDY

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

*Code as follows:*

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

### 2.2 Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?

Yes

### 2.3 Are the results of this study directly applicable to the patient group targeted by this guideline?

Yes

### 2.4 Notes. Summarises 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.

More patients in the intensive intervention than in the minimal intervention were abstinent a 1 years. The odds of quitting smoking were 2 times greater for those in the intensive intervention. Adequate concealment is used in the study.

*Level of evidence: 1++*
Study identification  


Guideline topic: An evidence-based smoking cessation program for patients with cardiac diseases

Key Question No: 1

Reviewer: Chan Lai Man

Before completing this checklist, consider:

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

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

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

SECTION 1: INTERNAL VALIDITY

In a well conducted RCT study...

Does this study do it?

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

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

1.3 An adequate concealment method is used. Yes □ No □ Can't say □

1.4 Subjects and investigators are kept ‘blind’ about treatment allocation. Yes □ No □ Can't say □

1.5 The treatment and control groups are similar at the start of the trial. Yes □ No □ Can't say □

1.6 The only difference between groups is the treatment under investigation. Yes □ No □ Can't say □

1.7 All relevant outcomes are measured in a standard, valid and reliable way. Yes □ No □ Can't say □
1.8 What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?  4.3%

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 ☐ No ☐ Can't say ☐ Does not apply ☐

1.10 Where the study is carried out at more than one site, results are comparable for all sites.

Yes ☐ No ☐ Can't say ☐ Does not apply ☐

SECTION 2: OVERALL ASSESSMENT OF THE STUDY

2.1 How well was the study done to minimise bias?

*Code as follows:*

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

2.2 Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention?

Yes

2.3 Are the results of this study directly applicable to the patient group targeted by this guideline?

Yes

2.4 Notes. Summarises 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.

An intensive smoking cessation intervention in smokers with cardiovascular disease is not only effective in achieving smoking cessation, but also reduces hospitalizations and total mortality rate when compared to usual care.

*Level of evidence: 1++*

**Guideline topic:** An evidence-based smoking cessation program for patients with cardiac diseases
**Key Question No:** 1
**Reviewer:** Chan Lai Man

**Before completing this checklist, consider:**

3. 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+.

4. 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**

<table>
<thead>
<tr>
<th>In a well conducted RCT study...</th>
<th>Does this study do it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 The study addresses an appropriate and clearly focused question.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td></td>
<td>Can’t say ☐</td>
</tr>
<tr>
<td>1.2 The assignment of subjects to treatment groups is randomised.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td></td>
<td>Can’t say ☐</td>
</tr>
<tr>
<td>1.3 An adequate concealment method is used.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td></td>
<td>Can’t say ☐</td>
</tr>
<tr>
<td>1.4 Subjects and investigators are kept ‘blind’ about treatment allocation.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td></td>
<td>Can’t say ☐</td>
</tr>
<tr>
<td>1.5 The treatment and control groups are similar at the start of the trial.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td></td>
<td>Can’t say ☐</td>
</tr>
<tr>
<td>1.6 The only difference between groups is the treatment under investigation.</td>
<td>Yes ☑  No ☐</td>
</tr>
<tr>
<td></td>
<td>Can’t say ☐</td>
</tr>
<tr>
<td>1.7</td>
<td>All relevant outcomes are measured in a standard, valid and reliable way.</td>
</tr>
<tr>
<td>1.8</td>
<td>What percentage of the individuals or clusters recruited into each treatment arm of the study dropped out before the study was completed?</td>
</tr>
<tr>
<td>1.9</td>
<td>All the subjects are analysed in the groups to which they were randomly allocated (often referred to as intention to treat analysis).</td>
</tr>
<tr>
<td>1.10</td>
<td>Where the study is carried out at more than one site, results are comparable for all sites.</td>
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**SECTION 2: OVERALL ASSESSMENT OF THE STUDY**

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

| 2.2 | Taking into account clinical considerations, your evaluation of the methodology used, and the statistical power of the study, are you certain that the overall effect is due to the study intervention? | Yes |

| 2.3 | Are the results of this study directly applicable to the patient group targeted by this guideline? | Yes |

| 2.4 | Notes. Summarises 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. | Twice as many participants in this inpatient smoking cessation counseling, with or without telephone follow-up, seems to have encouraged more participants to remain non-smokers in 6 months. Higher number of discontinued participants in the usual care group caused the overall drop-rates to 30%. | Level of evidence : 1++ |
Appendix 4

Evidence-Based Practice Guideline

Title:
An evidence-based smoking cessation program for patients with cardiac diseases

Background:
Heart disease is the third leading causes of death in Hong Kong which kills over 6000 people annually (Department of Health, 2014) and cigarette smoking is one of the major modifiable risk factors for the cardiac diseases. In fact, evidence shows that a reduction of the risk of recurrent myocardial infarct and subsequent death were observed in quitters diagnosed with coronary event (Critchley & Capewell, 2003). Hospitalization provides a golden opportunities to initiate smoking cessation since patients are forced to refrain from smoking cues in this smoke free environment. Since there is no any systematic guideline in smoking cessation for our cardiac patients, it is necessary to establish an evidence-based pathway for the health care professionals to provide effective smoking cessation measures for patients and promote a better quality of life.

Aims:
The aim of the program is to provide a systematic framework for the health care professionals to promote smoking cessation for hospitalized cardiac patients.
Objectives:

- To formulate the clinical instructions on smoking cessations for patients during hospital stay and after discharge
- To standardized the nursing practices for smoking cessation interventions of the program
- To improve the smoking cessation rates and health outcomes of the cardiac smokers

Target users:

All nurses working in the target wards and the trained smoking cessation counselors

Target group:

Current adult smokers with cardiac diseases or after undergoing cardiac surgeries admitted to the general medical wards

Recommendations:

Assessment

Recommendation 1: Access and document patients’ smoking status and physical dependence on nicotine (Grade A)

Baseline information for the target patients should be collected before the commencement of the program. These data may include patient’s smoking status such as number of years smoked and average cigarettes smoked per day. Physical dependence on nicotine is also be accessed using Fagerstrom Test for Nicotine Dependence (Berndt et al, 2014)[1++] (Smith,
Intervention

Recommendation 2.1: Brief advice and the distribution of the self-help materials (Grade A)

General brief advice on smoking cessation should be done by the ward nurses after patient assessment upon admission (Berndt et al., 2014)[1++](Smith, Corso, Brown & Cameron, 2011)[1+] (Smith & Burgess, 2009)[1++]. Information brochures or pamphlets concerning smoking cessation are provided to the target clients (Berndt et al., 2014)[1++] (Smith, Corso, Brown & Cameron, 2011)[1+] (Smith & Burgess, 2009)[1++] (Mohiuddin et al., 2007)[1+].

Recommendation 2.2: Inpatient counseling of at least 30 minutes by the trained smoking cessation counselors (Grade A)

All of the five studies have supported the implementation of inpatient counseling for the target populations. The duration of the counseling session should be at least 30 minutes and carried out by the trained smoking cessation counselors (Berndt et al, 2014)[1++] (Smith, Corso, Brown & Cameron, 2011)[1+] (Smith & Burgess, 2009)[1++] (Mohiuddin et al., 2007)[1+] (Chouinard & Ekstrand, 2005)[1++].
**Recommendation 2.3: Cognitive-behavioral models as the framework for counseling**

(Grade A)

Various behavioral and cognitive frameworks were adopted in the selected studies for counseling which prove to be effective in smoking cessation. Relapse-prevention model were used in the studies of Smith, Corso, Brown & Cameron (2011)[1+] & Smith & Burgesse (2009)[1++] while Transtheoretical model were applied in the studies of Berndt et al. (2014)[1++] & Chouinard & Ekstrand (2005)[1++].

**Post discharge follow-ups**

**Recommendation 3.1: Post discharge follow-up should be started within a week**

(Grade A)

Four studies had mentioned that patients should be contacted and follow-up interventions should be started within a week after discharge in order to sustain the cessation treatments and achieve a better outcome (Smith, Corso, Brown & Cameron, 2011)[1+] (Smith & Burgesse, 2009)[1++] (Mohiuddin et al., 2007)[1+] (Chouinard & Ekstrand, 2005)[1++]

**Recommendation 3.2: Provide telephone follow-up counseling for at least 6 times over 2 months (Grade A)**

Among the five studies that statistically increased the cessation rates of the cardiac smokers when compared with the controls, three had provided telephone follow-up counseling for the patients which are feasible to the target settings (Smith, Corso, Brown & Cameron, 2011)[1+]
There should be at least 6 follow-up calls delivered over 2 months after patients’ discharge.

**Evaluation**

**Recommendation 4: Evaluate patient’s smoking status at 6-months and 12-months with self-reported 7 days point-prevalence abstinence (PPA) (Grade A)**

Three studies had accessed the client’s smoking status at 6 & 12 months after discharge to evaluate the effectiveness of the program (Smith, Corso, Brown & Cameron, 2011)[1+]

(Smith & Burgess, 2009)[1++] (Mohiuddin et al., 2007)[1+]. Self-reported 7 days PPA, which is a reliable measurement of smoking abstinence, should be used to access the smoking status of the clients (Berndt et al, 2014)[1++] (Smith, Corso, Brown & Cameron, 2011)[1+]

(Smith & Burgess, 2009) [1++] (Chouinard & Ekstrand, 2005)[1++]
Appendix 5: Interpretation algorithm of the smoking behavior stages of change scale

1. Are you currently smoking?
   - Yes
   - No

2. Are you seriously thinking of quitting smoking?
   - No, not thinking of quitting.
   - Yes, within the next 6 months.
   - Yes, within the next 30 days.
   - In the last year, how many times have you quit smoking for at least 24 hours?
     - If no quit attempt in the past year then
     - If they have at least one 24-hour quit attempt in the past year then

3. How long have you quit smoking?
   - I quit within the last 6 months.
   - I quit more than 6 months ago.

4. Action
5. Maintenance
Appendix 6

Knowledge test for smoking cessation training

1. What is the correct smoking cessation medication for hypertensive female patient with bulimia?

2. Is patient using nicotine patch can shower or bathe?

3. How to diminish sleep disturbances when using the nicotine patch?

4. What is the length of time after quitting tobacco that most nicotine withdrawal symptoms resolve?

5. Is it true that tobacco users require multiple quit attempts?

6. When counseling a young adult woman using nicotine lozenge, is it appropriate to counsel about weight gain after quitting?

7. How would you approach patients who are not yet considering quitting?

8. What is the most rapid method to administer nicotine into the bloodstream?

9. Do nicotine withdrawal symptoms include improved task performance?