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Rx for Change: Nurses' Response to a Smoking Cessation Intervention

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Abstract

"A Randomized Controlled Trial to evaluate *Rx for Change*: Nurse's Response to a Smoking Cessation Intervention"

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Problem: An evaluation of a smoking cessation educational intervention for direct care RNs.

Design: A randomized controlled trial.

Methods: The study was conducted at a large Midwestern academic medical center. Direct care Registered nurses (dcRN's) employed at least .7 FTE and spending 80% of their time in direct patient care on general medicine or general surgery units were recruited. Recruitment occurred between April and May, 2009. Outcome data was abstracted from charts of patients receiving care from the intervention group.

Interventions: Participants were randomized to either 'Rx for Change' which was a training program regarding tobacco cessation or to a 'usual care' group. Pre-testing was completed upon randomization and post-testing was done 6 weeks later. The intervention was adapted from the full 'Rx for Change Program' which consisted of didactic material and role playing exercises and was completed in four hours. Objective: Determine if providing dcRN with educational seminars (*Rx for Change)* makes an impact on smoking cessation intervention with hospitalized patients compared with intervention rates by nurses without exposure to 'Rx for Change'. Outcome measures included improvement in skill, confidence, knowledge about tobacco addiction and smoking cessation interventions with currently smoking patients. Outcomes included increases in documented interventions with smoking patients following 'Rx for Change'.

Randomization: Randomization was computer-generated. **Results:** 176 participants volunteered. 71 were randomized to the control group and 105 were randomized to the intervention group. Retention was 94% for controls and 53% for 'Rx for Change'.

Outcome: The 'Rx for Change' showed significant increases in skill ($p<0.005$, confidence (($p<0.0005$), knowledge ($p<0.0005$) and intent to actively intervene with smoking patients ($p=0.03$) compared to the control group. Chart audit reveal 42% voluntary charting of patient intervention. **Conclusions:** 'Rx for Change' is an effective way to educate dcRNs about tobacco use and promoted active intervention with smoking patients.

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CHAPTER 1

"To accomplish great things, we must not only act, but also dream; not only plan, but also believe." Anatole France

General Problem Area

Healthy People 2010 identified ten leading public health issues which have received a high-priority for intervention (Office of Disease Prevention and Health Promotion, 2008). The intentions of the indicators are to educate the United States public about the health of the nation and inform about important changes we can make to improve individual, family and community health. The third Leading Health indicator is Tobacco use (Office of Disease Prevention and Health Promotion, 2008). It is third only to Physical activity and Overweight and Obesity as affecting the health of the United States population.

Tobacco use in the United States affects a large portion of the health of the country. Between the years 1997-2001 there were 438,000 deaths per year attributed to tobacco use, rendering it the leading cause of preventable death (Center for Disease Control, 2009). In the last 10 years there has been no sustained reduction in the number of deaths related to tobacco use (Center for Disease Control, 2002). The Center for Disease Control reports that tobacco related illness accounts for more deaths than AIDS, alcohol, cocaine, heroin, homicide, suicide, motor vehicle crashes and fires combined (Center for Disease Control, 2009). Census data in 1991 showed that the smoking rate in adults was 24% and over the next 10 years there was some variation, but in 1999 the adult smoking rate remained 24% (Center for Disease Control, 2002). The Health People 2010 goal for reduction in adult smoking rate was 12%, which has not been achieved in the last two decades. The adult tobacco use rate is Missouri was 23.2% in 2007 (Kuhlenbeck, 2008).

Despite aggressive campaigns on both the national and local levels tobacco use rates remain virtually unchanged in this country. The Healthy people 2010 goals for reduction of tobacco use was 16% in adolescents from the current rate in 1999 of 34% and down to 12% in adults from 24% (Center for Disease Control, 2002). The primary reason for the goal was to improve the health of the population. Tobacco use has both negative health consequences on the individual's health and the on environmental health. Regular tobacco use has been associated with development of heart disease, cerebral vascular accident, lung cancer, chronic lung disease all of which are leading causes of death in the United States (Center for Disease Control, 2009). There are also effects on the environment that affect the health of the population, both from injuries sustained from accidental burns as well as property and land destruction from careless disposal of tobacco products (Center for Disease Control, 2009). Environmental tobacco smoke, second and third hand smoke has also been associated with increased of heart disease and significant lung conditions, especially asthma and bronchitis in children. Environmental tobacco smoke accounts for 3000 deaths per year in non smokers.

For all of the health related reasons stated previously the federal government has become involved in reduction of tobacco use in the United States. Fiore et al. (2004), formed a commission to make recommendations for hospitals to become involved in reducing tobacco consumption. The commission recommended that persons admitted to the hospital with acute myocardial infarction (AMI), congestive heart failure (CHF) or community acquired pneumonia (CAP) have their smoking status evaluated. The intention of this recommendation was that the time of inpatient admission represented an opportune time to intervene with patients to achieve abstinence. Despite the intention, little progress was made and The Joint Commission was charged with ensuring the guidelines were met. Subsequently, an additional regulation requires

all patients who are admitted with AMI, CHF or CAP not only have their smoking status evaluated, but also be offered assistance in smoking cessation (The Joint Commission, 2008).

Nursing has now become accountable in this process. The National Quality Forum (NQF) has developed nursing-sensitive care measures that are 15 measures intended to improve the quality of nursing care provided (The Joint Commission, 2008). The 15 nursing-sensitive care measures are divided into three categories; patient centered outcome measures, nursing-centered intervention measures and system-centered measures. The relevant group to this discussion is the three nursing-centered intervention measures. The three measures are smoking cessation counseling for AMI, CHF and CAP (The Joint Commission, 2008). For the first time nurse are being held accountable in the healthcare system for their patient interaction. As the role of the direct care RN (dcRN) has always revolved around health promotion and disease prevention and assisting patients to make behavior changes it is within scope of practice that accountability for this should be expected.

Nursing has long been charged with making interventions with patients to make necessary behavior changes to improve the quality and quantity of life. Nursing is also the group that impacts communities to improve the health of the community. It is therefore natural that nurses would make necessary intervention strategies to reduce tobacco consumption and improve not only individual health but the health of the masses. Direct care nursing is in a unique position to intervene with patients who may by virtue of a disease related hospitalization be ready to make the commitment necessary to achieve abstinence. Smoking cessation education does not require a physician's order nor does it necessarily require a prescription for medications. The first steps toward intervention with a patient can be counseling.

Nursing and nursing education has always had a focus on disease prevention. Disease prevention has shown to be more effective than disease treatment. There is a wide range of topics covered in basic nursing school curriculum intended to teach nursing students relevant ways to prevent diseases such as communicable disease, heart disease and hypertension. However, the topic of tobacco addiction and treatment for abstinence has been overlooked in nursing curricula. A major focus of this project was to fill the gap that exists on this topic and to empower direct care RN (dcRN) to intervene with their patients to promote smoking cessation.

The other unique characteristic that nursing brings to this problem is that of caring. Nurses as part of what they do provide for all aspects of patient need in a more caring environment. There are currently 2.5 million nurses in the United States, who represent the largest portion of the health care team. As such, nurses are poised to make a difference in this health problem that continues to plague our over burdened health care system.

Problem Statement

Currently, dcRN's are accountable to intervene with patients who are smoking to promote smoking cessation for their well being. However, their basic nursing education and in most cases their graduate nursing education does not include any didactic information on the topic to provided a solid foundation on which to base their practice intervention. Several opportunities (such as the American Lung Association workshops) exist outside the basic and advanced nursing education sphere that do allow for further knowledge to be gained on the topic of smoking cessation intervention. However, these are not readily available to dcRN.

To more fully understand the dcRN's desire and ability to intervene with hospitalized patients, it is necessary to more fully understand their current understanding of the problem and assess and enhance their ability to intervene. Tobacco addiction, while complex, has long been

understood to be an important phenomenon in assessing the patient's ability and willingness to change behaviors to enhance their quality and quantity of life. Nurses must be educated on this topic more fully if they are expected to intervene in a meaningful way to facilitate change.

Specific Aims

Specific Aim 1

Determine if basic characteristics of the dcRN are predictors of ability/willingness to intervene with patients to promote smoking cessation. The basic information about the dcRN will include age, sex, race and past as well as current smoking status of the nurse. An evaluation of the current level of education of the dcRN (diploma, ADN, BSN, MSN) was established to formally evaluate and draw conclusions from the impact of the nurses' basic educational level and the impact that has on interventions provided.

Evaluate the dcRN participants for the following characteristics:

- Assess the level of preexisting knowledge the dcRN has about the effects of tobacco on the body.
- Assess the dcRN' ability to provided smoking cessation counseling.
- Assess the retention of material provided during learning session.
- Assess the dcRN' ability to deliver learned content to hospitalized patients.
- Assess the retention of the learned material after 45 days.

Specific Aim 2

Determine if providing dcRN with educational seminars (*Rx for Change)* makes an impact on smoking cessation intervention with hospitalized patients compared with intervention rates by nurses prior to exposure to 'Rx for Change'.

Specific Aim 3

Compare responses of the dcRN to the responses of the pharmacists to establish validity and reliability of the 'Rx for Change' in the nursing population. Evaluate the 'Rx for Change' Smoking Cessation program for the following:

- Assess the reliability of the program when utilized in a group of dcRN.
- Establish validity of the instrument in dcRN.

Background and Significance of the Problem

According to the Healthy People 2010 report, tobacco use is a leading cause of preventable death in the United States, accounting for more than 430,000 deaths annually (Center for Disease Control, 2009). Smoking related deaths account for more deaths than motor vehicle crashes, fires, AIDS, alcohol, suicide, homicide, cocaine and alcohol (Center for Disease Control, 2009). Nurses represent more than 2.5 million people in the health care work force and are in a unique position to influence reducing tobacco use. The acute care hospitalization presents an opportune time to address this significant health risk behavior. As all hospitals have become smoke free, the forced abstinence during hospitalization for other causes provides an excellent time for a nurse to intervene to work toward long-term abstinence. Properly educated and trained, nurses who have regular ongoing contact with the patients could make a significant difference in achieving abstinence in hospitalized patients. Despite current nursing shortages and the burden this places on the dcRN, there is ample time to make significant progress. Brief nursing interventions of as little as five minutes have been shown to make statistically significant differences in long-term abstinent rates (Simon, 2003).

This study will demonstrate the potential of the dcRN's role in promoting smoking cessation to improve population health, economics and long-term welfare of this country. The

effects of tobacco on society have been well established and brought into public awareness as early as the 1960 by Surgeon General Report by C. Koop. At that time, warning labels were added to cigarette packages as a deterrent to continued tobacco use. Despite this and many other public health campaigns, no real progress has been made to show a sustained decreased in tobacco use.

Tobacco use is implicated in 430,000 preventable deaths annually (Center for Disease Control, 2009). As deficits in the health status of the population are identified, nurses can be instrumental in effecting change to decrease tobacco use. Health promotion and disease prevention are part of the core responsibilities of nursing today. Nursing has a long history of assisting patients in making life improving changes in health behaviors. As such, the 2.5 million nurses in this country are poised to make a significant impact in the current smoking status of hospitalized patients (Wewers, Sarna, & Rice, 2006). Nurses have a responsibility to the public to become involved on every level to decrease tobacco use to improve the health of this country. One step involves becoming active politically to change health policy, providing incentives to current tobacco users to quit. Nurses must also become involved with individual patients to encourage abstinence. Finally, nurses must become involved in research surrounding tobacco use to make meaningful contributions to the research literature on the topic of illness induced by tobacco use and ways to decrease current tobacco use.

Despite goals set by Healthy People 2010 and initial success in decreasing tobacco use, the progress has stalled; and new measures to decrease public tobacco use are needed (Beato, 2003). Federal policy has been recently inserted in healthcare delivery in an attempt to decrease current smoking rates. The Joint Commission of Accreditation of Healthcare Organizations has mandated that all patients hospitalized with congestive heart failure, community acquired

pneumonia and acute myocardial infarction have their smoking status evaluated on the initial nursing admission form (Balkstra, Fields, & Roesler, 2006). Recognizing mere identification of patients currently using tobacco is not enough. The Joint Commission of Accreditation of Healthcare Organizations further requires that some intervention be offered to patients to assist in quitting (Balkstra et al., 2006). Nursing, as a profession, has not done enough to meet the expectations of The Joint Commission of Accreditation of Healthcare Organizations mandates (Balkstra et al., 2006; N. H. Miller, 2006). Meeting the first expectation of acquiring the information is only achieved sporadically. The second expectation of intervention is even less predictably achieved (N. H. Miller, 2006; Sarna & Bialous, 2006). There are several proffered reasons for this failure. One is that nurses have significant barriers to intervention including: lack of time for interventions, nurse are often smokers themselves and unlikely to intervene and finally they lack the necessary skill set to intervene effectively (N. H. Miller, 2006; Sarna & Bialous, 2006).

When surveyed, 66% of nursing education programs reported no structured component of the program to address morbidity associated with tobacco use or strategies to assist patients in quitting (Wewers et al., 2006). The survey concluded that the topic was “sprinkled throughout” the program. Of the programs that reported structured inclusion of the material, no specific measures were available to assess success of students in mastering the material.

Other health care disciplines have made a much more structured effort to educate students. Hudmon, Kilfoy, & Prokhorov (2003) developed a structured program for pharmacy students in California. The ‘RX for Change’ educational intervention has been able to show success in improving the knowledge base of students who had been formally educated on tobacco addiction and in strategies to assist patients to quit smoking (p.143). It is reasonable to

expect that nursing programs include tobacco cessation and behavior modification techniques be covered specifically within a nursing school curriculum. Other disease states that are directly attributed to an individual's behavior are covered, such as obesity, alcoholism and drug addiction. With proper preparation, it is reasonable to expect nurses to be expert enough to make a meaningful contribution in decreasing tobacco use rates.

The 'RX for Change' program has recently been evaluated with undergraduate baccalaureate nursing students (Butler et al., 2009). The study evaluated the use of the program with undergraduate nursing students to evaluate a modified delivery of the program to 2 hours of didactic content or the original 6 hour format. This study showed that the students were able to master the content with a statistically significant improvement in their skill, confidence, knowledge ($p<0.0001$) and the activity subscale ($p=1.03$) on a *t* test (Butler et al., 2009).

The current literature has conflicting data on nurses' success on impacting smoking cessation rates. The literature available shows that nurses can have a positive impact on quit rates (Feeney, McPherson, Connor, McAlister, & Young, 2001; Hollis, Lichtenstein, Vogt, Stevens, & Biglan, 1993; N. H. Miller, Smith, DeBusk, Sobel, & Taylor, 1997; Stevens, Glasgow, Hollis, Lichtenstein, & Vogt, 1993; Taylor, Houston-Miller, Killen, & DeBusk, 1990; Taylor et al., 1996). However, there is other literature available that nursing intervention makes no significant impact on quit rates (Bolman, de Vries, & van Breukelen, 2003; Hajek, Taylor, & Mills, 2002; Nagle, Hensley, Schofield, & Koschel, 2005; Rice et al., 1994; Rigotti et al., 1997; Rigotti, McKool, & Shiffman, 1994; Wewers, Kidd, Armbruster, & Sarna, 2004). There have been no replication studies to validate the results on either side of the question. There is very little qualitative data available to evaluate the current level of education of nurses on the subject of the consequences of chronic tobacco use. Further, there is little data available to evaluate nurses'

attitudes, beliefs and motives with regard to cessation counseling. Without this basic understanding of what nurses know and how nurses feel about counseling, it will be difficult to make significant impact on current tobacco use.

CHAPTER 2 – REVIEW OF THE LITERATURE

Review of the literature on smoking cessation

Introduction

The purposes of this review are to (a) evaluate the current level of health problems that continued tobacco use presents to this country, (b) assess the current literature available to evaluate the dcRN' abilities to fulfill their obligation to promote smoking cessation, (c) evaluate currently employed strategies utilized to improve nursing participation in reducing tobacco use in hospitalized patients, (d) identify future directions for nursing research in this area. This will be accomplished by evaluating literature about the epidemiology of tobacco use and interventions, current status of nursing education, nursing beliefs and attitudes and finally current intervention strategies.

A review of the current literature was conducted using OVID, CINHAL and Pub MED databases. The keywords used for the search were: nursing intervention, smoking cessation, tobacco use, practice guidelines and smoking epidemiology. Additional keywords used were: nurse's role in smoking cessation, randomized control trials in nursing intervened smoking cessation, tobacco use in nursing and meta-analysis in smoking cessation. To obtain the literature on theoretical models used to evaluate smoking cessation practices keyword used were: health belief model, transtheoretical model, stages of change in smoking cessation and health models in smoking cessation. Health promotion in smoking cessation and disease prevention in smoking cessation were also used.

Health promotion and disease prevention are the key concepts used for this paper. Health promotion remains an integral part of nursing practice (Fawcett, Watson, Neumann, Walker, & Fitzpatrick, 2001). General consideration in the realm of nursing is that health promotion leads to

disease prevention. A dcRN has the education and expectation to provide the patient with adequate information and recommendations with regard to improvement of their general health condition. These recommendations may be with regard to their exercise status, dietary intake or other practices that may negatively impact their health status, such as alcohol intake or tobacco use. Health promotion and disease prevention are achieved, since it is certainly true that discontinuation of tobacco use leads to a reduction in co-morbid conditions.

This review will be organized to evaluate first theoretical models used to asses smoking cessation interventions. An evaluation of representative literature on current epidemiology of tobacco use and intervention strategies on smoking cessation is provided, followed by current Federal regulations and The Joint Commission of Accreditation of Healthcare Organizations requirements with regard to smoking policy and recommendations. Studies about nurses' attitudes, beliefs and intentions in providing smoking cessation counseling will be reviewed, along with current intervention strategies utilized to promote cessation. A review of the current literature surrounding nurse managed smoking cessation programs and nurse mediated smoking cessation counseling strategies will be evaluated. A brief review of nicotine replacement therapy to augment cessation and abstinence will be included in the review, but drug intervention is not the specific focus of this review and will therefore be limited. Finally, a gap analysis, along with recommendations for future research, will be provided.

Epidemiology of Tobacco use and Interventions

More than 10 years ago, Hughes (1996) identified six trends that continue to influence health care providers and the impact they are able to have on current tobacco use (p. 1797). These characteristics remain unchanged in the last 10 years. The first is that smokers come predominantly from lower socioeconomic groups, and are nicotine dependent, requiring medical

intervention to achieve abstinence. In a 2005 survey, smoking rates were 43.2% in adults who had earned a General Education Development diploma, followed by 32.6% in those who had only achieved 9—11 years of education(Prevention, 2005). Current smoking was 29.6% of those living below the poverty level, while represented only 20.6% of those living above the poverty level (Prevention, 2005). Nicotine replacement therapy (NRT) has been shown to reduce the urge to smoke and diminishes other withdrawal symptoms following cessation (West, McNeill, & Raw, 2000). The difficulty becomes the economic ability to obtain NRT with limited financial resources (West et al., 2000).

Secondly, healthcare reform needs to be cost effective to reach the large number of persons currently smoking, estimates are that 45.1 million people are currently smoking (Hughes, 1996; Prevention, 2005; Sarna & Lillington, 2002). Of these 45.1 million current smokers, half will die from complications of their tobacco addiction (Cokkinides, Bandi, Ward, Jemal, & Thun, 2006). This accounts for nearly 1 in 5 deaths in the United States (Cokkinides et al., 2006). Several ways to attempt to decrease this social problem have been suggested. On a policy level, increasing excise taxes on cigarettes has been shown to decrease tobacco use (Cokkinides et al., 2006). The state of Missouri remains the second lowest state when evaluating tobacco taxes, while the state remains one of the highest (24.1%) of the population currently smoke (Cokkinides et al., 2006; Prevention, 2005). Taxes not only decrease smoking rates, taxes also allocate money to fund comprehensive tobacco control programs, which will decrease tobacco use. The recent failure of the tobacco tax increase is another indication of the intense need for nurses to become politically active to assist in passage of this important legislation.

The third characteristic is the need for the development of guidelines or algorithms to promote a stepped-care approach (Hughes, 1996). Healthcare providers do not have all the skills

necessary to impact current smokers. McBride, Emmons and Lipkus (2003) report that with recognition of “Teachable Moments”, interventions can improve smoking cessation rates from 15-78% (p. 156). Recognition of these teachable moments gives the healthcare provider the opportunity to make a significant impact on smoking status (McBride, Emmons, & Lipkus, 2003). Guidelines or algorithms would provide the information needed to make healthcare providers more comfortable with providing the necessary care.

As a fourth characteristic, Hughes (1996) identified the need for an emphasis on smoking as a drug addiction and the need for appropriate interventions (p. 1797). W. Miller (1998) identifies smoking as an addictive behavior, which feels good and further reports that “we are wired to repeat such responses” (W. R. Miller, 1998). Tobacco use should be treated as other drug addictions, with behavior modification. Medical intervention such as NRT, anti-anxiety medication or nicotine blocking agents should be used as necessary.

The fifth characteristic is the need for harm reduction strategies (Hughes, 1996). Lay (2003) recognized that tobacco addiction in hospitalized patients represents “an ideal place for nurses to use psychoeducational interventions promoting relapse prevention upon discharge” (p. 66). Hellman, Cummings, Haughey, Zielezny, & O’Shea (1991) showed in a cohort of self initiated smoking behavior change that the single predictor influencing continued abstinence is smoking fewer cigarettes per day (p. 80). If healthcare providers could help patients reduce daily consumption as a first step, increased abstinence rates could be observed (Hellman, Cummings, Haughey, Zielezny, & O'Shea, 1991). Continued intervention in daily smokers to assist them in realizing their risk will increase their likelihood of reducing or quitting smoking, as the daily smoker is most likely to suffer from optimistic bias and not perceive personal likelihood of developing serious illness (McCoy et al., 1992; West, McEwen, Bolling, & Owen, 2001). Risk

reduction occurs to a greater extent in individuals who quit smoking before age 35 (Conner, 2002). Individuals who stop smoking can reduce their risk of developing congestive heart failure, acute myocardial infarction, respiratory disease, to that of a never smoker after five years of abstinence (Conner, 2002; Sarna & Lillington, 2002). Rates of developing cancer reduce dramatically within five to ten years of abstinence.

The sixth step is the need for smoking cessation therapies to be reimbursable, so medical professionals can develop a more intensive and ongoing intervention strategy (Hughes, 1996). The economic impact of continued tobacco use on this country's economy is staggering. For each pack of cigarettes smoked, $3.45 of associated medical costs is accrued. There is $3.73 in lost productivity, totaling $7.18 per pack of cigarettes smoked, and having a cumulative effect on the economy of $157 billion dollars (Suchanek Hudmon, Kilfoy, & Prokhorov, 2006). With financial incentives at this level, there is little rational argument for not impacting current tobacco use. This does not address the loss of human life and the impact on families.

Federal Guidelines and The Joint Commission of Accreditation of Healthcare Organizations Requirements

Fiore et al., (2004) were charged with developing a national tobacco cessation action plan (p. 205). This plan was developed by a review of evidence based literature, inquiring of national experts and inclusion of the public opinion (Fiore et al., 2004). The recommendations from the committee resulted in 6 detailed recommendations and 4 public-private partnership recommendations. The six recommendations include: development of a "a nationwide Tobacco Cessation Quitline", required a "mutli-faceted, paid national media campaign to encourage cessation, provide insurance coverage for tobacco dependence treatment for all 100 million federally covered lives, create a new tobacco research infrastructure, create new tobacco training

infrastructure for clinicians and finally, create a Smokers' Health Fund. The four public-private partnership opportunities include: mobilize health insurers to cover all lives, mobilize health systems to implement system-level changes to foster tobacco dependence treatments, mobilize national quality assurance and accreditation organizations, clinicians, health systems and others to establish and measure the treatment of tobacco dependence as part of standard of care and finally, mobilize communities to ensure that policies and programs are in place for everyone, especially underserved populations to use" (Fiore et al., 2004).

From these recommendations, The Joint Commission of Accreditation of Healthcare Organizations was mandated to implement quality improvement measures to ensure the inquiry of patients admitted with three high risk diagnosis, pneumonia, acute myocardial infarction and congestive heart failure, for smoking status (Balkstra et al., 2006). If, at the time of admission, patients are found to be current smokers, intervention must be offered during the hospitalization(Balkstra et al., 2006). The intention is to decrease current tobacco rates as well as promote health of the community.

While increased attention to tobacco use is a reasonable first step, it is unlikely to have dramatic effects on cessation rates (Boyle & Solberg, 2004). Boyle & Solberg (2004) reports that the requirement of inquiry of patients smoking status, while documentation rates improved, no evidence of increased advice to quit smoking or other smoking cessation support was found, showing no improvement in quit rates (p. 22). For significant impact to be made, it requires a more intensive intervention with the patient (Cromwell, Bartosch, Fiore, Hasselblad, & Baker, 1997). More intensive intervention could result in significant financial savings, as well as increase in number of years lived and better health during those years (Cromwell et al., 1997).

The health economics of smoking cessation is a relatively new concept in health care. K. Warner, Mendez, & Smith (2005) evaluated the economics of smoking cessation coverage in a managed care organization (p. 57). The results of the study showed that providing coverage resulted in $3,417 for each life year saved, which on average was 7.1 years per person, resulting in a significant savings (K. E. Warner, Mendez, & Smith, 2005). In a previous study, K. Warner, Smith, Smith & Fries (1996) was able to show a 1.3 million dollar return on investment in a large corporation by including smoking cessation programs (p. 991). The end points in the study showed significant improvement on allocations of medical care, absenteeism, increase in on-the-job productivity and decrease in life insurance rates. These returns on investment were not evident in the first three years. It was cost neutral at that point. The financial gain was noticeable by year 4-5 (K. E. Warner, Smith, Smith, & Fries, 1996). The other very interesting product of the study was to evaluate the implications on society (K. E. Warner et al., 1996). With continued follow up of persons who left for other jobs as well as retirees, there was early evidence of secondary gain by continued abstinence (K. E. Warner et al., 1996). It is only with partnerships with health economists that the necessary projections can be obtained, allowing for realization of the potential gain of intervention on this magnitude (Hale, 2000). Insurance companies must move from the minutia of considering the cost per patient to the realization of the large scale potential millions saved by the intervention.

Nurses must become a part of the political solution of this problem. Malone (2006) made a very relevant observation about nurses: “taking care of victims of tobacco in late stages take precedence over tobacco cessation counseling or preventative health education” (p. 54). Nursing also often takes the view of care of the individual, with little consideration given to the care of the community or society as a whole (Malone, 2006). Nurses need to closely evaluate the impact

of tobacco use on society, and unify in one voice to change the current disease driven healthcare system. Smoking cessation interventions are the most cost effective treatments available, and nurses are the largest health care provider available and able to make a significant contribution (Bialous, 2006).

Nurses Beliefs, Attitudes and Intentions

Burke & Fair (2003) reviewed the primary reasons nurses do not provide adequate smoking interventions (p. 257). The primary reason cited was a feeling of lack of training and skills needed to provide counseling (Burke & Fair, 2003). The second reason stated was lack of confidence in personal counseling skills (Burke & Fair, 2003). The four skills and attributes considered essential for a successful health care provider include: expertise and knowledge of the subject, skills for assessing readiness for behavior change, relationship building skills and skill in considering the patients attitudes and beliefs about the disease or treatment (Burke & Fair, 2003). A descriptive study of general practitioners and family practitioners showed similar results (Vogt, Hall, & Marteau, 2005). That study had some differences in practitioner attitudes, including feeling that providing tobacco counseling was too time consuming and ineffective (Vogt et al., 2005). However many similarities were evident; 22% reported a lack of confidence in their ability to provide counseling, 16% lacked confidence in their knowledge, 18% felt the discussion was unpleasant and less than 5% felt it was outside their professional duty, intruded on patient privacy or the discussion was inappropriate (Vogt et al., 2005). There are many similarities between the attitudes of nurses and physicians.

Three studies of nurses' attitudes show that nurses who currently smoke or have never smoked are less likely to give smoking cessation counseling (Karen Chalmers et al., 2001; Hall, Vogt, & Marteau, 2005; Williams, Levesque, Zeldman, Wright, & Deci, 2003). Hall (2005)

conducted a cross sectional survey of 200 practice nurses in London, England, with 152/200 or 76% response rate. Of the 152 responders (63% non smokers, 32% ex-smokers), and 5% current smokers, 66% reported specific training in smoking cessation education. The 5% current smokers is a lower rate of smoking than is reported in most US studies. Chalmers et al., (2001) reports current smoking rates of nurses were similar to the general population, but higher than physicians and dentists (p. 117). Smoking cessation interventions showed disappointing long term abstinence rates, with only 5% of nurses remaining abstinent at 12 months. This is significant because nurses who smoke are less likely to intervene with patients who smoke (Sarna & Lillington, 2002).

Williams et al., (2003) reports that physician enthusiasm for smoking cessation intervention is directly related to perceived competence on counseling (p. 550). The study followed 220 health care practitioners who attended a workshop on smoking cessation counseling (Williams et al., 2003). The training group included 104 physicians, 280 other providers, including nurses, respiratory therapists and health counselors (Williams et al., 2003). The completion group of both Time 1 and Time 2 questionnaires included 61 physicians and 159 others (Williams et al., 2003). Attending the workshop correlates with increased competence at performing counseling and time spent counseling patients to abstinence (Williams et al., 2003). Guidelines aimed at tobacco counseling are more likely to be followed by practitioners who receive support from insurers (Williams et al., 2003).

A survey of 909 undergraduate and graduate nursing education programs showed that only one third covered smoking cessation interventions, and only 16% of graduate programs covered systematic assessment and intervention strategies (Wewers et al., 2006). There has been interest in evaluating nursing students' tobacco use. Three studies identified students' tobacco

use (Babrow, Black, & Tiffany, 1990; K. Chalmers, Seguire, & Brown, 2002; Durmaz & Ustun, 2006). Chalmers et al., (2002) provided a descriptive study of 272 bachelors of nursing students (p. 17). Current smokers represent 22.1% of the population, 91.4 self reported a desire to quit, while only 16.9% had made an attempt in the last year (K. Chalmers et al., 2002). Durmaz & Ustun (2005) provided a descriptive study of 253 students of which 29.2% are current smokers (p. 328). Nursing students represent 45.1% of the respondents, while 54.9% of the respondents are health care personnel. Both studies conclude that anti smoking interventions could produce significant results if utilized appropriately, as a majority of students relate smoking to stress (K. Chalmers et al., 2002; Durmaz & Ustun, 2006). A study by Babrow, Black and Tiffany (1990) of undergraduate students showed similar results (p. 154). Current smokers represented 13.3% of the population (Babrow et al., 1990). Recommendations of this study also indicate opportunities for intervention of students who are smokers, as the most commonly reported motivation was stress related to studies. While the studies were of students of different majors there was no significant difference in motivations to smoking.

Current Intervention Strategies to Promote Smoking Cessation

Nurses represent the highest number of health care providers in the United States. Nurses are in a unique position to evaluate patients and promote behavioral changes to impact the health of the general population by making brief interventions during an acute care hospitalization. While tobacco abuse affects a large stratum of the population, smoking rates tend to be higher in the most vulnerable populations. Smoking rates tend to be higher in individuals with lower education levels, manual laborers and minority populations. Recognizing these disparities, nurses are more likely to identify regular tobacco users and potentially make significant impact on their health. The Joint Commission of Accreditation of Healthcare Organizations recommendations

include assessment of every patient admitted to hospital with pneumonia, acute myocardial infarction and congestive heart failure for their smoking status (The Joint Commission, 2008). Lindell & Reinke (1999) recommends adding this as the fifth vital signs (p. 297). The dcRN has the ability to assess a patient's nicotine dependence using the brief Fagerstrom scale (Lindell & Reinke, 1999). The scale consists of six brief questions, and would allow the nurse to make an estimation of the likelihood of the individual developing withdrawal symptoms during the early phase of smoking cessation. Recognition of the potential for withdrawal symptoms allows the nurse to educate patients on strategies for prevention. Regular interaction and daily assessments of the patient would also allow the dcRN time to assess an individual's motivation for smoking cessation. Assessing the patient's stages of change, precontemplation, contemplation, preparation, action and maintenance will allow the dcRN to develop an individualized plan of care. Assessing for smoking triggers and assisting the patient in developing strategies to avoid these triggers would improve abstinence rates (Lindell & Reinke, 1999). Once an accurate assessment of the patient was completed, the nurse would be in the best position to assist the patient in determining an appropriate strategy to accomplish smoking cessation. The three most common strategies describe in the literature include quitting "cold turkey ", provision of nicotine replacement therapy and behavior modification. An evaluation of the literature on these topics will be undertaken subsequently. Behavior modification is often discussed with regard to level of intensity. Many authors describe interventions with low intensity, moderate intensity or high-intensity. When levels of intervention are introduced there does not seem to be any consistent application in the literature. The addition of nicotine replacement therapy is often associated with improved abstinence rates. The discussion will follow about these current intervention strategies and their impact on smoking cessation rates.

The current literature on smoking cessation promotion is dominated by physician interventions. Mojica et al., (2004) conducted a meta-regression analysis of studies to determine effectiveness of the different levels of providers, physicians, psychologists, counselors, nurses and others to establish the effectiveness of individual providers (p. 391). The analysis also included evaluation of the providers in combination with prescription for nicotine replacement therapy (Mojica et al., 2004). The conclusion of the study were that clinical psychologists, physicians and nurses provided the largest benefit to providing smoking cessation counseling (Mojica et al., 2004). The analysis also supported nicotine replacement therapy as a method to increase, by twofold, anticipated success rates (Mojica et al., 2004). It is unclear whether the studies chosen for this analysis were powered in such a way as to actually support these conclusions. By the author's own admission, only one study of the more than 35 studies utilized for this meta-analysis directly compared different types of providers (Mojica et al., 2004). This leaves open the possibility that each individual study was conducted in a different manner; therefore it is not possible to combine them in one meta-analysis and draw these conclusions.

Similarly, we compared brief physician counseling with physician counseling combined with nurse counseling that show similar results. Lancaster et al., (1999) conducted a study of 497 individuals, which were randomized to either a control group which received brief physician counseling, or an intervention group which combine brief physician counseling with follow-up nurse counseling (p. 191). In this study, both the 3 and the 12 month follow-up showed no statistical significant difference between the groups (Lancaster et al., 1999). In fact, the intervention group, while not statistically significant, showed a somewhat lower smoking cessation rate. Nagle et al., (2005) conducted a study of 1,422 individuals, 711 randomized to each group (p. 285). The control group received usual care (Nagle et al., 2005). The intervention

group in the study received nurse delivered information, nicotine replacement therapy and a subsequent letter promoting abstinence (Nagle et al., 2005). In this study, measured at 3 and 12 months, no significant difference between the control and the intervention of arms was noted (Nagle et al., 2005). The study did have biological markers confirming abstinence. Hajek et al., (2002) conducted a study randomizing people to the usual care, which consisted of verbal counseling and printed materials, while the intervention group received 20-30 minutes of counseling, a carbon monoxide reading and print material followed by a quiz (p. 324). This group also received an invitation to group counseling. Measures at six weeks and 12 months following initiation into the study showed no significant statistical difference between the groups.

Gorin & Heck (2004) conducted a similar review of 37 randomized clinical trials or quasi-experiments (with control groups) to evaluate individual providers' effectiveness in delivering smoking cessation counseling (p. 2013). Of the 37 studies identified for evaluation, 17 represented nurses as providers (Gorin & Heck, 2004). In this analysis, the nurse model was the least effective in comparison with physicians, multiprovider or dentist (Gorin & Heck, 2004). Comparison of physicians and nurses as primary interventionists showed physicians to be significantly more effective in providing counseling than nurses ($P = 0.005$). Gorin & Heck, (2004) concluded that additional training would be useful for nurses (p. 2019). The basis for this comment seems to be that the expense incurred in utilizing physicians as the primary interventionists was theoretically not cost-effective. Gorin & Heck (2004) goes on to speculate that the much larger pool of dcRN could potentially be much more effective if properly trained.

The literature remains quite varied on the appropriate approach of dealing with smoking cessation. Alterman, Gariti, & Mulvaney (2001) conducted a study with 240 participants

randomized into three treatment groups (p. 261). The first treatment group consisted of 80 individuals who received a low intensity intervention, characterized by one advice and education session with the nurse practitioner and nicotine replacement therapy (Alterman et al., 2001). The second group consisted of 80 individuals receiving four advice and education sessions with the nurse practitioner and nicotine replacement therapy (Alterman et al., 2001). The final group consisted of 80 individuals who received four advice and education sessions with the nurse practitioner, 12 weeks of individualized cognitive-behavioral therapy and nicotine replacement therapy (Alterman et al., 2001). The study was interesting in that it showed statistical significance at nine weeks and at 52 weeks of smoking cessation in the low intensity and high-intensity group (Alterman et al., 2001). There was no statistically significant improvement in smoking cessation rates in the moderate intensity group (Alterman et al., 2001). At the end of the 52 week program, there were 27 of the initial 80 individuals in the low intensity group that had achieved and maintained abstinence (Alterman et al., 2001). In the high-intensity group, there were only 35 of the original 82 who achieved and maintained abstinence (Alterman et al., 2001). The study also contained cost analysis showing that the low intensity groups had an average cost of $308 per person, and the high-intensity group $582 per person; while smoking cessation rates are higher in the high-intensity group they are not twice as high. To substantiate these results, all self reported non-smoking individuals were confirmed by biochemical methods. While this number is larger than in the low intensity group, it is not reasonable to assume that that rate of smoking cessation could be maintained in a larger study population.

Janz et al., (1987) conducted a study in an outpatient program comparing usual care to provider intervention (PI) and provider intervention with a smoking cessation manual (PI/M) (p. 805). The study population included 250 individuals. There were 106 in the usual care group, 69

in the PI group and 75 in the PI/M group (Janz et al., 1987). The primary focus of this study was not absence from smoking but motivation to quit at one month and six months. The results of this study showed that interventions of either PI or PI/M are superior to usual care (Janz et al., 1987). An interesting finding of this study was that the usual care group had a significant improvement in their quit attempts at six months. The author explains this by the number of telephone interviews about smoking cessation and their quit attempts that occurred as part of this process. Again, this reinforces the notion that telephone support is beneficial to promote smoking cessation.

Simon (2003) conducted a study of 223 hospitalized smokers, and compared minimal counseling to intensive counseling with the addition of nicotine replacement therapy in both groups (p. 555). This was one of the few studies located that reinforced intensive counseling as beneficial, even with the addition of nicotine replacement therapy. The minimal counseling groups received counseling on the dangers of smoking and were given self-help literature; the session lasted 10 minutes (Simon, 2003). Along with this, nicotine replacement therapy was provided for eight weeks. The intensive counseling group received intensive behavioral intervention by a trained nurse or public-health educator, and the sessions lasted from 30 to 60 minutes (Simon, 2003). A variety of subjects were covered, including benefits of quitting, beliefs, barriers and the patient's current knowledge level. Techniques intended to counteract relapse triggers were provided. These patients were also provided eight weeks of nicotine replacement therapy. Follow-up telephone calls were made at week one after discharge and monthly for the next three months. The results of this study showed the abstinence rate at six months in the intensive counseling group was 35% and 21% in the minimal counseling group (Simon, 2003). At 12 months again, there was a significant difference in abstinence rates 33% in

the intensive counseling group, while only 20% in the minimal counseling group. While there was no usual care group followed in the study, the authors did extrapolate based on other studies that the addition of nicotine replacement therapy improved short and long term absence rates.

While the studies show a variety of proposed interventions to promote smoking cessation, no one single study shows overwhelming evidence that should be used as guidelines for treatment strategies. Most of the studies involved small groups, consisting of less than 100 participants. It is difficult to extrapolate this information to a larger cohort of patients. There were no identical replication studies identified in the literature.

Nurse Managed Smoking Cessation Programs

The acute care hospitalization has been identified to be a particularly useful time for intensive interventions to promote changes in negative health behaviors. Green & Briggs (2006) investigated the topic of intervening during hospitalization to promote smoking cessation (p. 82). Three specific barriers were identified that negatively influenced a positive exchange of information that would promote smoking cessation (Green & Briggs, 2006). These barriers included: a significant lack of motivation on the patient's part, demands upon the nursing staff which did not allow time for the intervention, finally and most importantly was the nurse’s discomfort and her lack of knowledge on the topic and a lack of confidence in intervening with patients. Since The Joint Commission of Accreditation of Healthcare Organizations imposed regulations requiring nurses to acquire and document tobacco use and intervene on smokers, there has been increased attention paid to the topic of tobacco use. D. Warner (2006) reviewed the end organ damage caused by continued tobacco use (p. 356). Outcomes of that review resulted in the clear identification of the " teachable moment " that occurs during an acute care hospitalization (D. O. Warner, 2006). It is during this acute phase of the illness that patients are

most receptive to recommendations with regard to smoking cessation (D. O. Warner, 2006). Also identified in the study was the beneficial effect of nicotine replacement therapy and that utilization of nicotine replacement represents a safe and effective alternative to continued tobacco use (D. O. Warner, 2006). During the acute care hospitalization is a good time for repeated interventions and promotion of behavioral changes necessary to accomplish abstinence. The following studies reviewed the ability of nurses to intervene during an acute care hospitalization and relevant outcomes of those interventions.

Significant strides have been made by nurses to incorporate smoking cessation into routine care. Hollis, Lichtenstein, Vogt, Stevens, & Biglan (1993) conducted a randomized controlled trial of 2691 individuals recruited for the purpose of evaluating minimal advice with three other arms that included self-quit training, referral to group cessation program or a combination of self-quit training and referral to a group smoking cessation (p. 521). For the purpose of statistical reporting, the three separate intervention groups were combined to create one intervention group verses the minimal intervention group of advice only (Hollis et al., 1993). At three months the advice group showed a 6.8% abstinence rate versus 12.3% absent rate in the intervention group (Hollis et al., 1993). At 12 months the advice only group revealed a 12.7% abstinence rate versus a 15% abstinence rate in the intervention group (Hollis et al., 1993). All results were biochemically confirmed. The results of the early data revealed that the smoking cessation rates could be doubled with the minimal intervention.

Haddock & Burrows (1997) conducted a study of 60 subjects divided equally into two groups, a control group and an intervention group (p. 1098). The results of that study revealed that patients in the intervention group showed a significant reduction in cigarette smoking (Haddock & Burrows, 1997). A much larger study by Taylor et al., (1996) included 660 subjects

divided into usual care verses intensive intervention (p. 1557). The intervention consisted of a meeting with a nurse, review of a videotape, use of a workbook, relaxation techniques, nicotine replacement and telephone follow-up (Taylor et al., 1996). At 12 months following the invention, the usual care group showed 21% abstinence rate verses 31% in the intervention group. (odds ratio = 1.7; 95% CI = 1.1, 2.3)

Smith et al., (2002) conducted a study of 1077 subjects who voluntarily enrolled into a smoking cessation program (p. 211). The program consisted of multiple components including advice, nicotine replacement and four nurse initiated post discharge telephone counseling calls (Smith et al., 2002). 12 months of smoking cessation was recorded, self reported as 49%. Taking into account the initial intent of 18% of the registrants having a desire to quit, this still represents 31% of patients absent at one year (Smith et al., 2002).

Nebot & Cabezas (1992) conducted a study of 425 subjects (p. 263). They were separated into three groups. Group A received brief counseling from a physician; group B received brief counseling from a physician and nicotine gum; group C received brief counseling from a primary care nurse (Nebot & Cabezas, 1992). The two month and one year follow-up of this group showed that physician counseling was equal to nurse counseling (Nebot & Cabezas, 1992). This is one of the few studies reported that showed nurses to have the same success in counseling as physicians.

Several other studies have been conducted which showed smoking cessation rates from nurse intervention programs at 12 months from 16.7% to 35.4%, indicating that nurse interventions can lead to successful outcomes (Rice & Stead, 2004; Sciamanna, Hoch, Duke, Fogle, & Ford, 2000; Stevens et al., 1993; Taylor et al., 1990). These studies varied widely in approach from in hospital interventions of counseling, to counseling with nicotine replacement

therapy, to initiation of counseling in the hospital followed by telephone calls after discharge. Tonnesen et al., (1996) conducted a study with 507 subjects enrolled, 254 in a motivational group and 253 in usual care (p. 2352). One year abstinence rate shows that there was double the number of patients that remained absent in the motivation alone group (Tonnesen et al., 1996). This represents only 7% of the population, but none the less showed statistical significance when compared to the usual care group (Tonnesen et al., 1996).

Nurse delivered smoking cessation interventions to special population groups has also been reported to be very effective (Doolan, Froelicher, Doolan, & Froelicher, 2006). Patients hospitalized at the time of acute myocardial infarction have been shown to have a significant response to smoking cessation interventions (Feeney et al., 2001; Rice et al., 1994; Wewers et al., 2004). These positive results are likely attributable to the patient's mind set at the time of an acute medical crisis. D. Warner (2006) also substantiated significant smoking cessation rates with patients whose intervention occurred in the immediate pre and perioperative phase of recovery (p. 365). The Women's Initiative for non-smoking (WINS) studies revealed that women have significantly different issues with regard to nicotine dependence and require a unique approach in evaluation (Froelicher, Li, Mahrer-Imhof, Christopherson, & Stewart, 2004; Oka, Katapodi, Lim, Bacchetti, & Froelicher, 2006).

The issue of the appropriate approach in dealing with patients who wish to achieve abstinence remains unclear. N. Miller, Smith, DeBusk, Sobel, & Taylor (1997) conducted a study of 990 individuals, randomizing them into three groups: usual care, minimal intervention and intensive intervention. One year abstinence rates revealed a statistically significant difference between the usual care and intensive intervention groups (p. 410). However, no statistical significance was identified with regard to the minimal intervention verses intensive

intervention groups. This finding remains at odds with other studies discussed in this paper, which showed minimal intervention was as successful (Simon, 2003). Another issue is with regard to the exact approach in dealing with patients. Tailored behavior change measures have long been thought to be effective when dealing with individuals. Kreuter & Strecher (1996) conducted a study of 1317 subjects that were randomized into 3 groups (p. 98). There was no statistical difference in abstinence rates at one year (Kreuter & Strecher, 1996). While tailored approaches have been successful in other health related issues, it was not found to be particularly successful in this group. Orleans, Boyd, Noll, Crosette, & Glassman (2000) evaluated a computer tailored intervention in the "older smokers ". In this study of 470 subjects, they were randomized to usual care receiving only a fact sheet, verses receiving a copy of a computer-generated tailored smoking cessation page and seven follow-up personalized computer-generated mailings (Orleans, Boyd, Noll, Crosette, & Glassman, 2000). In this group, while not achieving statistical significance, there was indication that this approach may be beneficial if pursued in a larger study group. Ryan & Lauver (2002) conducted a review of the literature on the subject of tailored interventions, and concluded that tailored interventions are more effective (p. 335). The majority of the studies reviewed occurred after 1996 and in multiple countries (Ryan & Lauver, 2002). None of the researchers in the studies were nurses.

Evaluation of smoking cessation interventions using the Transtheoretical Model

The Transtheoretical Model has been investigated extensively as a behavior change model in the area of smoking cessation (Chouinard, Robichaud-Ekstrand, Chouinard, & Robichaud-Ekstrand, 2005; Clements-Thompson et al., 1998; Cole, 2001; Herzog, Abrams, Emmons, Linnan, & Shadel, 1999; Lawrence et al., 2003; Perz et al., 1996; Prochaska et al., 1994; Quinlan, McCaul, Quinlan, & McCaul, 2000; Rosen & Rosen, 2000; Schumann et al.,

2007; Segan, Borland, Kenneth, & Greenwood, 2002). Incorporation of an accurate assessment of the individuals' readiness to change allows for a more tailored approach to smoking cessation intervention (Cole, 2001). Choulinard & Robichaud-Ekstrand implemented a study that tailored the intervention to the patients smoking with their stage of change. The study consisted of three groups of hospitalized patients, usual care, inpatient counseling and inpatient counseling with telephone follow-up. The two intervention groups that received counseling were analyzed based on their current stage of change. The intervention for precontemplators focused on increasing perceived cons of smoking and encouraging the use of process of change. Contemplators focused on enhancing the perceived cons and decreasing the pros. The preparation stage was the most complex having targeting four principles: (1) increasing cons and decreasing pros of smoking; (2) increasing the use of behavioral process of change; (3) self-efficacy reinforcement; and (4) relapse-prevention skills are acquired (Chouinard et al., 2005). Finally, the action stage intervention was based on increasing utilization of behavioral process, providing skills to promote relapse-prevention, self-efficacy is reinforced, and congratulatory language is utilized to promote continued abstinence and to reinforce cessation attempts. The abstinent rates for the inpatient counseling with telephone follow up group showed significant improvement 44.4% (n = 24) compared with the inpatient counseling alone 33.3%, and 23.6% with the usual care group. At six months the separation between groups was greater; inpatient counseling with telephone follow up 41.5% (n = 22), 30.2 (n = 16), and 20% (n = 11). While the total percentage of patients who remained non smokers is higher in the intervention group they fail to achieve statistical significance. This may be largely due to the small numbers in the groups. Chouinard & Robichaud-Ekstrand analyzed the information to evaluate progression between stages and did find that the inpatient counseling with telephone follow up group did make positive progress

between stages in larger numbers than the other two groups and did achieve statistical significance ($p<.04$). More importantly, in the usual care group no progression was found in the precontemplator or contemplator out to six months of follow up. In the hospital counseling group, both with and without telephone intervention there was increased likelihood of being a non smoker at 6 months than were individuals in the usual care group.

Clements-Thompson, et al., (1998) conducted a study to evaluate 3,966 active military personnel who were forced to stop smoking as a result of enrollment in basic military training (BMT), secondary to a ban on smoking during BMT. Of the total group 1,508 were evaluated as precontemplators and stated they were likely to resume smoking (Clements-Thompson et al., 1998). The Contemplation group = 4,662 and were considering remaining abstinent after BMT. The remaining 3,966 were part of the action group and voiced an intention to remain abstinent after completion of BMT. While the purpose of this study was mostly focused on the demographic variables that would likely predict cognitive readiness to remain abstinent, there is rich data that may be provide insight into correlation between the stages of change when in a forced situation and that information seems to be excluded from the data analysis. The analysis focuses on demographic variables and the intention to stay quit without much insight as to why the variables may impact intention to say quit.

Perz, DiClemente and Carbonari (1996) evaluated 388 individuals for their use of processes of change in navigating successfully or unsuccessfully between stages of change. Participants were evaluated at pre-test, 1 and 6-month post-tests (Perz et al., 1996). Evaluation included smoking history, process of change and smoking outcome. Results of the multivariate analysis showed that at one month statistical significance was achieved in both the time only group, those that utilized the right process at pre-test and 1 month post test. The timing and

amount group, those who utilize the right process in the right amount, also showed statistical significance at one month. Neither group achieved statistical significance at six month follow up, but was predicted of success. The important contribution from this study is that utilization of the process of change can predict success in attaining abstinence.

Quinlan and McCaul (2000) constructed a study to evaluate interventions matched to stage of change and found that participants who received action interventions attempted smoking cessation regardless of stage of change (Quinlan et al., 2000). The study was conducted with intervention in both stage matched and stage mismatched participants. The of 143 participants who were classified as precontemplators, ultimately only 94 were enrolled, 35 opted out and 14 failed to show for pre-test. Two additional participants dropped out after the pre-test, leaving 92 in the final sample. These individuals were randomized to stage matched groups (n = 30), the stage mismatched group (n = 28) or the assessment only group (n = 34). Analysis categorized participants as advancers if progress was seen at least one stage, or nonadvancers if not forward progress was made. Quinlan and McCaul (2000) report that the stage-mismatched group had 54% progress one or more stage compared with the stage matched group 30% or the assessment-only group 35%. This was opposite of the original hypothesis. While the difference is of interest no statistical significance was obtained. The ANCOVA did achieve statistical significance in the mismatched group intention to quit smoking when compared with the assessment-only group. No difference was shown between the stage-mismatched and stage matched groups.

This study is limited in that it included college students with lower average daily smoking habits than are generally reported. The stage mismatched group would also have issues of peer pressure that were not adequately accounted for in this study. It is possible that other issues are at work. The study size is also quite restricted and much smaller than other reported results.

Gap Analysis and Recommendations for Future Research

In the current literature, relatively little information exists that adequately characterizes the attitudes, beliefs and intentions of the dcRN who are being asked to intervene on currently smoking patient. DcRN need to be evaluated in a more complete way to develop an understanding of their biases about tobacco use. It is only with this understanding that complex interventions could be developed.

While the current smoking rate of nurses is thought to be that of the general population, more needs to be done to accurately assess the situation. The smoking rates of other health care providers have been falling over the last several years. There is no reason that without proper intervention this could not be true for nurses. Research needs to be completed to adequately assess nurses who currently smoke that will allow development of interventions to promote abstinence in this population of individuals who could potentially decrease smoking rates on a more global basis.

A more thorough understanding of the current educational process of undergraduate and graduate nurse programs needs to be made. It is difficult to understand the process without more clarification. To ignore the fundamental problem of inadequate preparation of a group of people we expect to actively participate in the intervention is very shortsighted. Research into the underlying structural problems of undergraduate and graduate nursing programs needs to be undertaken.

The current literature is difficult to interpret and extrapolate in its current form. There is very little replication of existing studies that would allow development of a standard approach to smoking cessation intervention. More literature needs to be developed to determine the most

cost-effective strategies for this intervention. Basically, nursing needs to work to develop a body of literature to support evidence based practice.

Finally more nurses need to be educated at the doctorial level to become future nurse researchers to address the problem of tobacco use in this country. Without nurse experts in the field of tobacco dependence and complications associated with chronic use, it will be difficult for nurses to develop a body of literature intended to inform all nurses.

Conceptual and Theoretical Framework

Two theoretical models have been included when evaluating motivation to pursue smoking cessation counseling: the Transtheoretical model and the Health Belief Model. The two models both have potential strengths. The Health Belief Model has the longest history, but is also fraught with the most criticisms. The Health Belief Model is based on the premise that a person is able to make the necessary changes once given the appropriate level of information and barriers are overcome. While simplistic in approach, it lacks the rigor necessary to overcome a heavily addictive health related problem.

The Transtheoretical Model (TTM) takes a much more comprehensive approach, looking at the process of change, stages of change, decisional balance and self efficacy. Incorporating this model includes evaluating a patient's readiness to change. The TTM for behavior change is the most frequently utilized model in evaluation of readiness to change. The TTM utilizes a complex structure of behavior analysis to establish an individual's likely response to targeted intervention. The model requires immediate classification of the individual into one of five groups of behavior change. In the first two stages the individual is interpreted as unlikely to change, but does establish a relationship with the patient that allows for progress when they are ready in the future. The last three stages represent individuals who are prepared to change and

will likely make necessary changes to improve their health situation. Subsequently, both models will be carefully reviewed.

Theories that comprise the Transtheoretical Model of Behavior Change

The Transtheoretical Model of Change is one of the most utilized models in health promotion activities. A search of the OVID database rendered 6392 articles utilizing the Transtheoretical Model of Change (TTM) as the basis for health behavior modification activities. The TTM has been utilized extensively in evaluating tobacco use and strategies to promote abstinence. Changing the high risk health behavior of tobacco use is a complex issue for which there is not a single medication, or simple therapeutic intervention that has been shown to facilitate the changing of the high risk behavior of tobacco use. Recognizing the inherent problems with the existing theoretical models, Prochaska and DiClemente developed the Transtheoretical Model of Behavior Change (Velicer, Prochaska, Fava, Norman, & Redding, 1998).

The Transtheoretical Model is a multi-component model that includes the stages of change, decisional balance and self-efficacy and processes of change intertwining and interacting variables that can be used to modify high risk health behaviors (DiClemente et al., 1991). As part of model development, Prochaska conducted a review of 872 subjects who achieved abstinence from cigarettes on their own to develop the Transtheoretical Model of Change (Prochaska & DiClemente, 1983). In this project, Prochaska and DiClemente identify five stages of change and ten processes of change, which culminated in the description of the Transtheoretical Model of Change (TTM) and further defined the emotions, cognitions and behavior involved in the complex issue of smoking cessation (Prochaska & DiClemente, 1983).

The TTM consists of five stages of change (DiClemente et al., 1991). This is important, as this represents the first model to consider change as a progression over time, instead of one single event resulting in changed behavior. Instead of the simple act of quitting smoking defining the entire model, the model has the stage construct as the key to the organization of the model. The five stages are *Precontemplation, Contemplation, Preparation, Action and Maintenance.*

Stages of change

Precontemplation stage had been defined as persons who have no intention of changing behavior, in this particular case quitting smoking, in the next six months (Velicer et al., 1998). The reasons for persons being in this stage are varied. They could lack the necessary information to change their behavior, or be under-informed on the topic of high risk health behaviors. The Pros of continued tobacco use far outweigh the Cons of continued use at this stage. Individuals who have made multiple attempts at quitting and have been unsuccessful, therefore demoralized, could be in this group (Prochaska, DiClemente, & Norcross, 1992). Traditional health promotion materials are not directed toward people who are not intending to change in the next six months, and are generally unsuccessful because they do not meet their needs.

Precontemplation has been further evaluated and is now considered to be subcategorized into the Precontemplation-Non Believer or the I won't stage and Precontemplation-Believer the I can't stage (Reed, 1995). The differentiation between these two groups allows for better understanding of how to motivate these individuals toward behavior change. The Precontemplation-Non Believer is the least likely to change and efforts toward education in this group are limited. In the Precontemplation Believer group, educational efforts are worthwhile as the Believers are more receptive to thinking about the barriers that have tripped them up in the past and make them feel unable to quit.

Contemplation stage is comprised of people who intend to make a change in the next six months (Velicer et al., 1998). Individuals in the Contemplation level are aware of both the Pros and Cons of the high risk health behavior. In this stage, people seem highly ambivalent. This can cause them to remain in this stage for long periods of time. Prochaska (1988) described this as "chronic contemplation or behavioral procrastination" (Velicer et al., 1998). Action oriented health promotion programs are not successful with this ambivalent group.

Preparation is a much more active stage, with people intending to take action within the next month. In the early writings by Prochaska and DiClemente, this stage was referred to as "decision making" (Prochaska et al., 1992). This stage was omitted by Prochaska and DiClemente for seven years, due to a misinterpretation of principle component analyses rather than paying attention to the cluster analysis, which clearly identified this group of individuals between contemplation and action (Prochaska et al., 1992). Another characteristic of people in this stage is that they have usually taken some significant action within the last year. Having a concrete plan is a hallmark of this stage, whether they have joined a support group, spoken to a physician or counselor or obtained self help books. They are prime candidates for recruitment for action.

Action stage is characterized by the overt modifications individuals have made within the last six months (Velicer et al., 1998). The commitment of time and energy to smoking cessation must be evident. Making partial changes such as reducing consumption of cigarettes or switching to low tar brand is not sufficient to be in the action stage. An individual must remain abstinent for at least 24 hours to six months to be considered in the action stage.

Maintenance stage is completely focused on prevention of relapse (Velicer et al., 1998). While not as active a stage, the continuation of change not the absence of change is important. This stage spans the time frame from six months to lifetime.

While the stages of change seem to occur in a linear model, in 1992 Prochaska, DiClemente and Norcross noted that people taking action to modify addiction rarely achieve success on the first attempt (Prochaska et al., 1992). A modification of the original model occurred, accounting for the fact that relapse is a common occurrence and is part of the recovery process. When relapse occurs, people regress to an earlier stage. While 15% regress back to precontemplation, 85% regress to contemplation or preparation (Prochaska et al., 1992).

Figure 1. *A Spiral Model of the Stages of Change (Prochaska et al., 1992)*

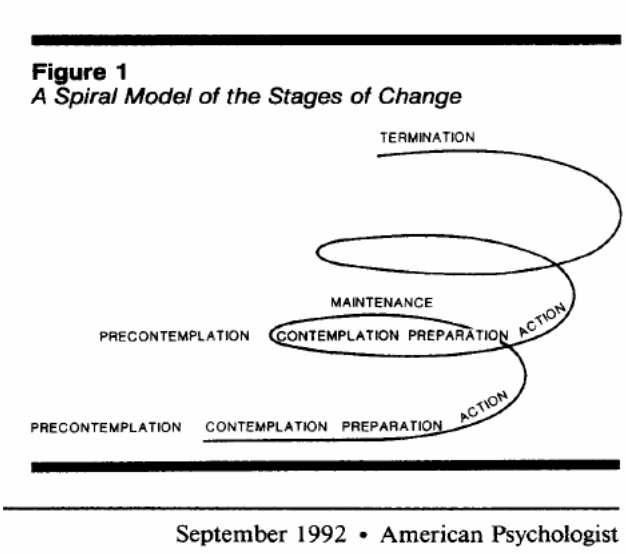


Figure 1: Spiral Model of the Stages of Change (Prochaska et al., 1992)

Process of Change

While the stages of change adequately describe the temporal dimensions individuals go through to accomplish change, it does not fully explain the processes necessary to facilitate movement between stages. There are both overt and covert activities utilized to achieve stage

progression. Understanding the processes needed to change will enhance the development of educational programs targeted at these very different groups. Prochaska and DiClemente defined the 10 process of change to be: "(a) consciousness raising, (b) self-liberation, (c) social liberation, (d) self-reevaluation, (e) environmental reevaluation, (f) counter conditioning, (g) stimulus control, (h) reinforcement management, (i) dramatic relief, and (j) helping relationships (Prochaska, Velicer, DiClemente, & Fava, 1988).

Table 1

Titles, Definitions, and Representative Interventions of the Process of Change (Prochaska et al., 1992)

Process	Definitions: Interventions
Consciousness raising	Increasing information about self and problem: observations, confrontation, interpretations, bibliotherapy
Self-reevaluation	Assessing how one feels and thinks about oneself with respect to a problem: value clarification, imagery, corrective emotional experience
Self-liberation	Choosing and commitment to act or belief in ability to change: decision-making therapy, New Year's resolutions, logotherapy techniques, commitment enhancing techniques
Counterconditioning	Substituting alternatives for problem behaviors: relaxation, desensitization, assertion, positive self-statements
Stimulus control	Avoiding or countering stimuli that elicit problem behaviors: restructuring one's environment (e.g., removing alcohol or fattening foods), avoiding high risk cues, fading techniques
Reinforcement management	Rewarding one's self or being rewarded by others for making changes: contingency contracts, overt and covert reinforcement, self-reward
Helping relationships	Being open and trusting about problems with someone who cares: therapeutic alliance, social support, self-help groups
Dramatic relief	Experiencing and expressing feelings about one's problems and solutions: psychodrama, grieving losses, role playing
Environmental reevaluation	Assessing how one's problem affects physical environment: empathy training, documentaries
Social liberation	Increasing alternatives for nonproblem behaviors available in society: advocating for rights of repressed, empowering, policy interventions

Much work has been done by Prochaska and DiClemente to evaluate these processes of change and evaluate at what points in the stages of change an individual utilizes these processes to forward that change (DiClemente et al., 1991; Herzog et al., 1999; Prochaska & DiClemente, 1983; Prochaska et al., 1992; Prochaska et al., 1988; Schumann et al., 2007). To progress from precontemplation to contemplation, a number of processes are frequently used including: processes of consciousness raising, dramatic relief and environmental reevaluation are most frequently utilized. To progress from contemplation to preparation stage, the process of self-reevaluation is utilized. Progression from preparation to action stage is supported by the process of self-liberation; and progression to maintenance is enhanced by reinforcement management, helping relationships, counter-conditioning and stimulus control (Prochaska et al., 1992).

Relationship between Stages of Change and Process of Change

These processes may be uniquely individualized and may be used in differing orders and at different times as individuals require. Generally, there is predicted utilization of the processes in a predicted order (Prochaska et al., 1992). Careful evaluation of these processes and the progression through the stages has allowed development of educational interventions that are

Table 2

Stages of Change in Which Particular Processes of Change are Emphasized (Prochaska et al., 1992)

Table 2
Stages of Change in Which Particular Processes of Change Are Emphasized

Precontemplation	Contemplation	Preparation	Action	Maintenanc
Consciousness raising				
Dramatic relief				
Environmental reevaluation				
	Self-reevaluation			
		Self-liberation		
			Reinforcement management	
			Helping relationships	
			Counterconditioning	
			Stimulus control	

more directed at persons in theses stages. Careful assessment of an individual's stage of changes and the processes they are utilizing to change may allow for these enhanced educational materials to be utilized more effectively.

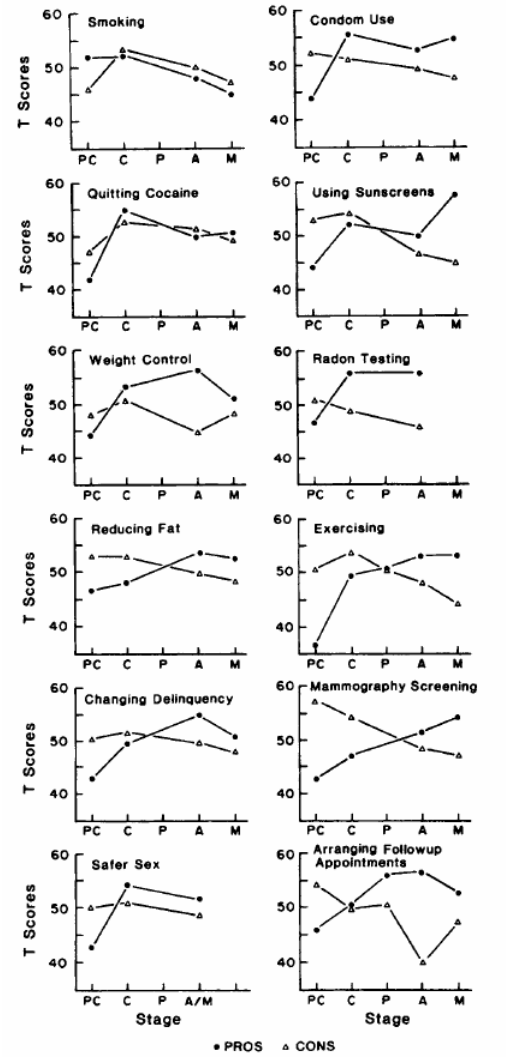
Decisional Balance

Prochaska and DiClemente incorporated the construct of Decisional Balance into the Transtheoretical Model to account for an individual's assessment of the Pros and Cons of changing health behaviors (Prochaska et al., 1994). This part of the model was derived from the original work of Janis and Mann's (1977) decisional balance constructs. The original work by Janis and Mann included eight categories that were simplified to two categories, Pros and Cons of a behavior (Janis & Mann, 1977; Prochaska et al., 1994). The importance of this simplification is to further the understanding the TTM. It becomes clear that as the Pros outweigh the Cons, crossover from one stage to the next occurs (Prochaska, 1994; Prochaska et al., 1994). The generalizability of the TTM becomes further enhanced by the incorporation of the concept of decisional balance. Observing that in 7 of 12 samples (smoking cessation, quitting cocaine, weight control, high fat diet, adolescent delinquency, safer sex, condom use, sunscreen use, radon gas exposure, exercise acquisition, mammography screening and physicians' practices), the crossover between Pros and Cons all occurred during the contemplation stage. This suggests that progress from precontemplation to contemplation requires an increase in the Pros to promote a change in behavior.

Relationship between Stages of Change and Decisional Balance

Prochaska et al., (1994) evaluated the relationship between the stages of change and the decisional balance in 12 problem behaviors (Prochaska et al., 1994). These behaviors included; smoking cessation, quitting cocaine, weight control, high-fat diets, adolescent delinquent

Figure 2. *Relationships between Stages of Change*



behaviors, safer sex, condom use, sunscreen use, radon gas exposure, exercise acquisition, mammography screening and physicians' preventive practices with smokers. The purpose of the study was to evaluate the relationships between stages of change and decisional balance between these 12 behaviors. Figure 2 shows they found relationships between the behaviors and the Pros and Cons of decision making. As evidenced in the study, the crossover for safer sex, condom use, weight control and radon testing happens between precontemplation and contemplation. There is a cross over between the Pros and Cons of the decision balance in smoking, cocaine, arranging follow up appointments occurring in the contemplation stage. The crossover for delinquency and sunscreen happens between contemplation and preparation. The exceptions occurred in the reducing fat and exercise acquisition group, in which the crossover occurred in the preparation stage. The crossover for mammography happens between preparation and action. In the delinquent behaviors, sunscreen use, high fat diets and mammography screening, the crossover occurred in the action stage. Prochaska et al., (1994) report the probability of .194 that crossover will occur prior to the action stage in 8 out of 12 studies (Prochaska et al., 1994).

Prochaska et al., (1994) found that the Pros of changing were higher in the contemplation stage than in precontemplation for all 12 problem behaviors (Prochaska et al., 1994). Figure 2 Pros and Cons (in T scores) by Stages of change for each of the 12 problem Behaviors. (PC=precontemplation; C = Contemplation; P=preparation; A=action; M=maintenance.)

The data suggests that participants evaluate the Pros of changing when progressing from precontemplation to contemplation (Prochaska et al., 1994). The data also supports that the Cons of changing decrease in the action stage compared with the contemplation stage in all 12 groups. This suggests that to progress from contemplation to action, there is a decrease in the Cons of changing. This data suggests that the crossover generally occurs prior to the participant taking action. This information becomes important as an intervention is developed, as initiatives that increase the Pros of changing should lead to progression from precontemplation to contemplation.

Self efficacy

Self-efficacy is the construct that represents a person's confidence that they can avoid relapse in a tempting situation (Velicer, 1998). Self-efficacy is often thought to be inversely related to temptations in that the higher the temptation the lower the self-efficacy. Self-efficacy is often at the lowest in the precontemplation stage and at the highest in the maintenance stage. The reverse is true with temptation being highest in the precontemplation stage and lowest in the maintenance stage. The crossover seems to occur in the preparation stage when a person's confidence at success is gaining and their ability to avoid temptation is lessening.

Prochaska based the self-efficacy construct on Banduras's self-efficacy theory (Bandura, 1982; Bandura & Bandura, 1977). The measure of temptation is based on intensity of a person's

urges when engaging in a specific behavior, namely tobacco consumption, during difficult situations. Since temptation is in effect the opposite of self-efficacy the same set of items can be utilized to measure both, by using different response formats. There are three factors that reflect most tempting situations; negative affect or emotional distress, positive social situations and craving or habit strength. Since the temptation/self-efficacy measures are sensitive to changes seen in the movement between the later stages of change they result in good predictors of relapse.

Population based approach

The utility of the TTM becomes evident as more and more studies incorporate the model into different aspects of health behaviors that require intervention for change (Prochaska, 1994; Prochaska et al., 1994). Prochaska et al., showed this in the 1994 evaluation of 12 problem behaviors. The study showed five involving cessation of negative behaviors, smoking and cocaine abuse are prime examples, and seven behaviors that require acquisition of positive behaviors, such as mammography screening and condom use (Prochaska, 1994; Prochaska et al., 1994). Since the TTM makes no assumption about an individual's readiness to change, the initial phase is an evaluation of the individual's stage of change. Since five distinct stages are identified and studies have shown that different populations are distributed between the stages, the TTM recognizes these differences and promotes the notion that appropriate interventions must be developed for each stage. This has translated into high participation rates in many studies coupled with lower dropout rates since interventions are directed at specific stages (Aveyard, Griffin, Lawrence, & Cheng, 2003; Bunton, Baldwin, Flynn, & Whitelaw, 2000; Cole, 2001; DiClemente et al., 1991; Herzog et al., 1999; Prochaska et al., 1994; Schumann et al., 2007; Segan et al., 2002; Velicer et al., 1998; West, 2005).

Proactive

The TTM reaches out proactively to early stage participants who would not come to a program or join a change group. This allows the total population, not just those ready to change, to become involved in the change process. The early stage people who need the intervention the most are reached out to and willing to engage in the change process because they are encouraged to do stage-appropriate strategies.

Individualized

Individualized smoking cessation programs are possible with utilization of the TTM's expert type system for feedback via interaction computer reports. Feedback to the smoker is based on the participant's stage of change, decisional balance scores, self-efficacy scores and the scores for the ten processes of change gathered using a TTM smoking assessment tool. Prochaska et al., (1993) presented a new model for individualized care based on a number of criteria: research on how people had quit on their own, the stage of change, and based on technological advances (Prochaska et al., 1993). The study conducted was of 756 volunteers recruited from newspaper ads (Prochaska et al., 1993). The study was made up of current cigarette smokers in one of three stages of change; precontemplation (n = 93), contemplation (n = 435), and preparation (n = 228). The participants were enrolled in one of four groups; standardized manuals (ALA + condition), individualized manuals (TTT condition), interactive computer reports (ITT condition) or personalized counselor calls (PITT condition).

The results of the study show that the ITT condition out-performed the other intervention groups from the inception of the data collection (Prochaska et al., 1993). The TTT and PITT conditions both had significantly better results at both 12 and 18 months than the ALA + condition. These results were consistent with abstinence rates, again with the ITT condition

outperforming the other three treatment groups. The PITT group produced twice as much abstinence as the ALA + at both 12 and 18 months. This data shows that the ITT condition

Figure .3 *Point Prevalence Abstinence*

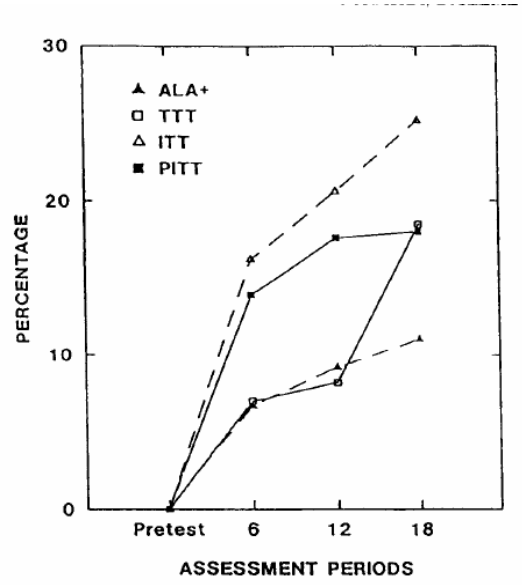
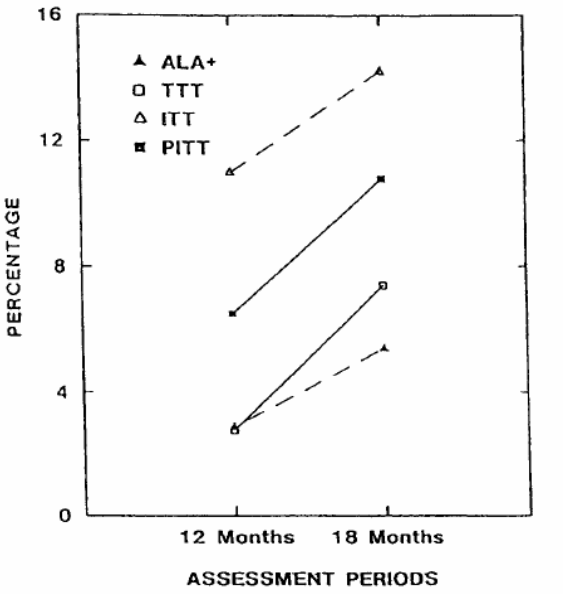


Figure 4. *Prolonged Abstinence*



(Prochaska et al., 1993)

results in the most cessation, and the ALA + condition results in the least impact. The only group that showed no improvement in the point prevalence rate between 12 and 18 months was the PITT condition, showed no improvement in this time frame.

Process Evaluation

Lastly, process evaluation can be utilized more effectively with the TTM. Evaluation of movement through the stages by individual participants can accomplish this. Change in use of the processes of change and the decisional balance scores of individuals will allow for a more

comprehensive program evaluation, and a more complete formative and summative evaluation of the intervention can take place.

Conclusion

This study is an excellent example of the improvements that can be achieved with individualized treatment programs based on stage of change (Prochaska et al., 1993). While there were differences between the groups, and ITT group clearly achieved more success in this study, the fact that there was improvement in all groups and significant abstinence rates achieved is important. There was also an impressively low dropout rate. This study achieved a 70% completion rate at 18 months with an 85% and 92% completion rate at 12 and 6 months respectively. The precontemplation group completion rate was 79%, the contemplation group 78% and the preparation group 82%, so there was not a significant drop out rate difference. This supports the notion that individualizing treatment strategies makes participants feel less pressured and more likely to continue with treatment which is the primary goal of therapy.

Hypothesis/ Research Questions

1. A knowledge deficit exists which impedes dcRN from intervening with currently smoking patients, an intense educational intervention ‘Rx for Change’ will diminish the knowledge deficit.
2. Intense education ‘RX for Change’ on the topic of smoking cessation will increase the dcRN’s confidence in their ability to intervene with currently smoking patients.
3. Intense education ‘Rx for Change’ on the topic of patient education about smoking cessation will be retained for 45 days following the intervention.
4. With education the dcRN will consistently chart their assessment of a patients’ stage of change.

5. Results of intensive education ‘Rx for Change’ will compare with previously obtained results of intervention with undergraduate nursing students.

CHAPTER 3 – METHODOLOGY

Purpose of Study

This chapter presents the study methodology. The sample size, target population and procedures for data collection and methods of data analysis are discussed. The ethical considerations including evaluation of the study by the investigational review board along with threats to internal and external validity will be discussed. The questionnaires utilized and the procedures for protection of human rights are described. The nurses in this study will consist only of nurses involved in direct patient care.

The primary purpose of the study was to evaluate the level of knowledge regarding tobacco cessation counseling by direct patient care nurses (dcRN). A systematic evaluation of the nurse's ability to intervene with currently smoking patients was done. There was an evaluation of the baseline knowledge that the dcRN possesses about current drug treatments utilized to enhance smoking cessation. The evaluation measured the dcRN's understanding of potential side effects of those drugs. An assessment was also made about the dcRN's understanding of the best methods to promote abstinence. Finally, an assessment was made about the sustainability of the educational intervention. A self evaluation of the dcRN's confidence in the ability to interact with patients to promote smoking cessation was conducted.

A secondary purpose was to evaluate the study intervention 'RX for Change' that has not been tested with dcRN working in an acute care hospital setting. It has previously been used extensively with both pharmacy students and registered pharmacists. However, no research reports about its effect with direct patient care nurses were located. The tool was evaluated for validity and reliability when utilized in a group of dcRN.

The final purpose was to evaluate the effectiveness of the program *('RX for Change')* to motivate the dcRNs to facilitate smoking cessation when interacting with hospitalized patients who smoke. By auditing routine charts and/or discharge instructions an evaluation was made of the impact that the additional nursing education had on addressing smoking with patients and documentation of this intervention.

Study Design

The design of this study is a randomized controlled trial (Figure 4). A timeline for the project shows the eight week duration of the study implementation and data collection (Table 3).

Figure 4. *Study Design*

$$R \quad \begin{matrix} O^{pre} & X & O_{post} & O_{Dpost} \\ O^{pre} & & & O_{Dpost} \end{matrix}$$

O^{pre} = Pre-test

O_{post} = Post-test

X = Intervention

O_{Dpost} = Delayed Post-test

Table 3. *Gantt Chart*

	Version 4.0		***Yellow cells = cells for data entry.***			Month-1					Month-2				Month-3				
	Tasks	**Owner**	**Plan Start**	**Plan Finish**	**Days**	3/2	3/9	3/16	3/23	3/30	4/6	4/13	4/20	4/27	5/4	5/11	5/18	5/25	6/1
Project Name																			
	Recruitment	LO	2-Mar-09	13-Mar-09	10														
	Intervention Day 1	LO	20-Mar-09	21-Mar-09	1														
	Intervention Day 2	LO	27-Mar-09	28-Mar-09	1														
	Intervention Day 1	LO	3-Apr-09	4-Apr-09	1														
	Audit Charts Group 1	LO	20-Apr-09	25-Apr-09	5														
	Audit Charts Group 2	LO	27-Apr-09	2-May-09	6														
	Audit Charts Group 3	LO	4-May-09	9-May-09	6														
	Delayted Post Test Group 1	LO	4-May-09	4-May-09	1														
	Delayted Post Test Group 2	LO	11-May-09	11-May-09	1														
	Delayted Post Test Group 3	LO	18-May-09	18-May-09	1														
	Control Group PreTest	LO	23-Mar-09	28-Mar-09	5														
	Control Group Delayed Post Test	LO	4-May-09	9-May-09	5														

Nurses were recruited from a large Midwestern academic medical center. There are currently 2900 nurses employed at the medical center. Flyers were posted throughout the hospital recruiting volunteers. Notices were also placed in the unit based newsletters on all general medicine and general surgery nursing divisions. Notices were placed in appropriate staff lounges. A request was sent to all appropriate nurse managers to announce the recruitment in staff meetings. The principal investigator approached staff nurses to fully explain the project and enroll participants. The nurses who volunteered by calling the posted phone number were screened and demographic data collected. Nurses who met inclusion criteria and wanted to participate after asking questions that they had were then randomly assigned to one of two groups. Randomization was (1) the intervention group or (2) the control group. The intervention group was eligible for CEUs for attending the educational session. The intervention group was also eligible to receive points that could be utilized to become or remain eligible for the hospitals Professional Nurse Development Program (PNDP). After a discussion director of the PNDP program a total of 4 points were awarded, 2 for attending the class and the possibility of 2 additional points for subsequently providing an in-service on their nursing unit. Remuneration was provided to all intervention group and control group participants in the form of a meal voucher in the total amount of $ 4.00 after completion of the study.

Using a random number table obtained from an internet web site to allow for enrollment the site used was; http://www.randomization.com (Dallal, 2009). All participants were added to the list and assigned to the control or intervention group based on the table. Group 1 on the table was the control group assignment; Group 2 on the table was the intervention group. After participants were screened and met inclusion criteria and agreed to fully participate if assigned to

the intervention group their name was added to the roster. Once their group assignment was noted the participant was immediately informed of the group assignment. Control group participants were given the pre-test and arrangements were made to subsequently for the principle investigator (PI) to pick up the completed pre-test. The intervention group participants were given a handout with the class dates and times and location noted on it. Intervention group participants were asked for an active e-mail account or alternate phone number for later contact to be used for confirmation of class date participation. A subsequent e-mail was sent to all intervention group participants confirming their participation and asking for confirmation of a date to attend class. Once the confirmation e-mail was received, a return e-mail contained date, time and location for the class.

Intervention Group

After randomization, the intervention group was given the choice of attending one of two consecutive Saturday education sessions or one Monday session. The study was conducted in a class room setting. Beverages and snacks were provided. The principle investigator was the only instructor for all of the educational sessions. Assistance was utilized in registration and obtaining continuation education units (CEU) for the program, along with awarding of CEUs at the end of the intervention. The nurses entered the room and were given the letter explaining the intent of the project (Appendix A). Intervention group participants had the opportunity to enter their name into a drawing to win a $ 50.00 department store gift card during the class room session. Participants were then given the pre-test along with the teaching material. Participants were instructed to fill out a slip of paper with their name and place it in a bag that was utilized for the drawing for the gift card. Participants filled out their name and information to be awarded CEU's for participation in the educational session (Appendix B). On the pre-test form

they were asked to write a number, which was a combination of their six digit birth date and the last four numbers of their social security number. They were later reminded to use the same number on the post test given at the end of the class as well as on the second post test delivered 45 days later.

After a brief introduction about the intention of the study and general orientation about the schedule of the day (Appendix C) class began. Prior to beginning the lecture participants were asked to complete the pre-test and were then asked to place the completed pre-test in the envelope marked pre-test (Appendix D). When everyone had completed the pre-test, all materials were collected. The tests were placed in an envelope with the intervention date and the name of the instructor and sealed. There were two fifteen minute break times during which snacks and beverages were provided. The post test was given at the conclusion of the intervention day, and the participants were asked to place them in the second envelope provided (Appendix E). The envelope was marked post test and the date and instructor's name placed on the outside and the envelope was then sealed. Continuing Education Units (CEU) credit was provided to nurses attending the one day seminar. The nurses' schedule was obtained separately four weeks following the intervention to make arrangements for chart auditing and delivery of the post test (Appendix F). Forty five days following the educational intervention the nurses were again given the post test. The post test was provided to the nurse on their nursing division in a sealed envelope with instructions to complete and return within one week. The nurse was asked to place the test in an envelope which they marked with the number initially chosen. The post test was placed in an envelope and the investigator dated and signed the envelope marked POST2. In the envelope were instructions for the dcRN to leave a voice mail that the test is

complete and the envelope was picked up from the nursing division. At this time, the meal voucher was provided.

Due to a larger than expected no show rate, a second random table was generated and a second wave of recruitment occurred. The recruitment was handled in exactly the same manner as the first. All intervention group participants were given a choice of class dates on two consecutive Saturdays or one Monday session. Communication occurred in exactly the same way.

After confirmation e-mail was received from the participants the date, time and location e-mail was sent. Classes were conducted in exactly the same manner described above. Again, a much larger than expected no show rate occurred and the end result was an intervention group of 56 participants.

Control Group

The control group represented a random sample of the recruited nurses. The nurses were given a research letter to read (Appendix G). After assignment to the control group, a mutually agreeable meeting was arranged that took place at the medical center. The nurses were given an envelope marked CPRE and asked to write a number that consisted of the six digits of their birth date and the last four numbers of their social security number on the outside of the envelope. Within the envelope was the pre-test which they were asked to complete at that time and their unique identifying number was placed on that pre-test (Appendix D). After completion, the envelope was returned to the investigator and the date and name of the investigator was placed on the envelope. At that time, all participants were discouraged from any intensive investigation of the topic of smoking cessation.

Four weeks following the pre-test the participants were contacted via the e-mail address or phone number they provided to ascertain a time to schedule post test time. The delayed post test was given forty five days after the pre-test. The post test was delivered in an envelope to the nursing division where they worked (Appendix E). The nurse was given an envelope containing the post test, marked CPOST and asked to complete the post test and return it within one week. Instructions for return were to leave a voice mail once completed and it was picked up. No intervention was provided, and they were asked if they have attended any additional training on the topic in the interim. Any participant who had attended an intensive educational session was excluded from further participation. In the event a participant elected not to participate any longer, their pre-test was removed from the pool. Upon completion of the post test, the nurse participants were given the $ 4.00 meal voucher.

All names of the control group were placed on a master list (Appendix H) for the purpose of scheduling the post test. No information was placed on the list other than, name, floor and assigned work schedule for the next two weeks. The work schedule forms were kept separately and added to the master list for follow up scheduling purposes. The principle investigator was the only person with access to this information.

Due to the larger than expected no show rate in the intervention group, a second random table was generated and additional participants were added to the control group as the random table required. The additional control group participants were handled in exactly the same manner as the initial group. All tests were collected and data was added to the original sample for 45 day follow up. No additional lists were kept.

Patient Intervention Follow up

A work schedule was obtained from every nurse in the intervention group (Appendix I). The floor assignment schedule was reviewed and a list was made of every patient the nurse cared for during the sixth week following the class. A review of the patients' record in the EMTEK system was made. The record evaluation included reviewing the daily incidental notes or the discharge note. The participating nurses' compliance with completing charting as instructed during the class was evaluated. The report evaluated total number of patients whom the participants had provided care. Secondarily, a review was made of the admission profile to ascertain which patients were recorded as smokers upon admission. Finally, the incidental notes and Multidisciplinary Discharge Form were evaluated. The number of times a chart entry was made for every patient the nurse provided smoking cessation education was recorded. The nurse was instructed during the class to chart in the incidental notes or in the event the patient was being discharged they were instructed to chart on the Multidisciplinary Discharge Form. The incidental notes were evaluated for the presence of one of the following statements (Table 4);

Table 4

Stages of Change for Charting Compliance

Stage 1:	I won't: Pt is not ready to quit at this time. Information given. I can't: Pt identifies barriers to quitting. Given work sheet to identify barriers, information given.
Stage 2:	Pt contemplating quitting. Information and support information given.
Stage 3:	Pt has set a quit date in the next month. Support information given.
Stage 4:	Pt quit using tobacco recently, support information given.
Stage 5:	Pt remains abstinent. Discussed continued abstinence and offered support.

The Multidisciplinary Discharge Form was evaluated for completion of the Smoking Cessation section and for completion of the Smoking Cessation Education Completion section (Appendix J). The completion of this box served as a proxy to evaluate for a behavior change in

the nurses who participated in the study. The Multidisciplinary Discharge Form was evaluated for the presence of one of the following statements previously described in Table 4.

Pilot Study

The study protocol was evaluated for feasibility by recruiting 5 advance practice nurses from the medical center. The study procedure was evaluated for practicality. The pilot study did not identify any changes that were needed in the protocol as it ran smoothly. The suggestion of adding a person to registered participants was made. The pilot study group was questioned for suggestions and/or improvements to the organization and delivery of the didactic material. The data collected from the pre-test and post-tests was entered into the database and a run of statistical data was obtained. The results were evaluated and any change to the data entry process or database was made as indicated. This sample was not included in the final sample as they were deemed ineligibly by study design.

Setting

DcRNs were recruited from a large urban medical center in the Midwest. The facility is an 1140 bed acute care, level 1 trauma center. There are currently 2900 registered nurses employed at the medical center. Nurses were recruited from the general medical nursing divisions. Randomization occurred utilizing a random number table. The two groups of nurses recruited for the study were; the intervention and the other was the control group. Nurses were recruited by posters in the main hallway and by information put in the various newsletters provided directly to staff nurses. The posters and information in the newsletters contained a phone number and pager number to reach the primary researcher. Information was also made available to for staff nurse meetings to recruit volunteers, again a phone number for the investigator was the method of enrollment.

Power Analysis

Accounting for the five variables assessment, ask, advice, assist and arrange as the important predictors with an alpha level of 0.05 and an anticipated effect size of 0.2, with a statistical power level of 0.8, the minimum required sample size of 60 in each group was obtained (Soper, 2009). To compensate for loss to follow up 66 nurses was recruited to each group. A larger than expected no show rate was found in the intervention group. A second randomization table was run and an additional 24 nurses were recruited using the same technique.

Sample

Sampling procedure: all registered nurses employed by the hospital on general medicine divisions or surgical nursing divisions between December, 2008 and May, 2009 were invited to participate in the study. A sample of 156 was obtained based on the power analysis 66 for each group and accounting for a larger than expected no show rate to the class. Randomization of all volunteers occurred. Specific inclusion and exclusion criteria are outlined. For the purpose of this study, participation was limited to nurses who provided direct patient care at least 80% of the time.

Inclusion Criteria

- Registered nurse 80% of time in direct patient care and are eligible to discharge patients
- Registered nurses who are considered greater than .66 full time equivalent
- Registered nurses working on General Medicine nursing divisions
- Registered nurses working on Surgery nursing divisions
- Registered nurses working for the Staffing Augmentation Team

- Registered nurses who have worked for the hospital for at least 6 months

Exclusion Criteria

- Registered Nurses who do not have 80% of time spent at bedside
- Nurses working less than .66 full time equivalent
- Nurses who have attended an intensive smoking cessation training program within the last 12 months
- Registered nurses who participate in or facilitate smoking cessation programs within the community

Conceptual Definitions

For the purpose of this project, several conceptual definitions were established.

- DcRN – a nurse who is at least .66 full time equivalent and who works at least 80% of the time in direct patient care and is eligible to discharge patients.
- Smoking – the process of consuming 1 cigarette in the last 24 hours.
- Nicotine addiction – the physiologic dependence on tobacco products containing nicotine.
- Adequate intervention – the amount of intervention a nurse must provide to impact a patients willingness to abstain from tobacco products.
- Baseline knowledge about the effects of tobacco – the knowledge a nurse has upon completion of undergraduate nursing programs.
- Strategies to reduce recidivism – the specific approach the nurse uses to impact a patient's desire to remain off cigarettes.

Intervention

The ‘RX for Change’ is a program that consists of a series of independent, but complementary, modules. The program emphasizes methods for behavior modification that could be incorporated into daily nursing care. The program is organized to allow the core modules to be taught to a group of nurses in approximately 4 hours. The program is organized to allow all of the participants to be given a pre-training survey. The content of the modules is described below in the educational intervention section.

Characteristics of the Instrument

Pre Training Survey

This survey consists of five demographic questions. These questions are intended to collate the sex, age, race and smoking history of the participant nurses. There are then three questions asking the participant to rate their personal ability to assist and counsel patients on smoking cessation. The next 10 multiple choice questions assess the participant’s knowledge of nicotine addiction and smoking cessation strategies. The final two questions acquire information about the participant’s belief that this smoking cessation information should be disseminated throughout the medical community. The pre-training survey is administered in an anonymous fashion; however, the information gathered is intended to be linked with a post training survey.

Post Training Survey

The post-training survey consists of a similar set of questions. However, the two initial questions ask the participant to rate the amount of information that was unique to this program. The survey also asks the participant to rate how much of this information they feel they will be able to utilize in practice which goes to intent to change behavior. The participant is asked to estimate how this will help them improve the total number of patients they counsel. Participants

are asked to rate the quality of counseling that they will be able to provide. The next three questions ask the participants to rate, on a five-point Likert scale, their ability, before and after participating in the educational intervention, to counsel and assist a patient in smoking cessation. The next three questions inquire of the participants how they would rate their ability to successfully counsel patients toward smoking cessation. The survey inquires, with two separate questions, about participant's opinion about whether schools of nursing should teach smoking cessation as part of their curriculum. Finally, the 10 questions that were asked on the pre-training survey about nicotine addiction and smoking cessation strategies are repeated. This survey instrument has shown a Cronbach alpha estimate for internal consistency for the four-item scale of the 0.83 in previous studies (Suchanek Hudmon et al., 2003).

Reliability and Validity

A major emphasis of this project is to establish reliability and validity of the *'RX for Change'* program with registered nurses in a large acute care urban medical center. Both validity and reliability will be evaluated and compared to previous studies using the *'RX for Change'* program.

Reliability

Cronbach alpha coefficient is a reasonable estimation of this tool, as there was only one test administrated to nurses. While alpha coefficients of greater than 0.70 are generally considered reflective of high reliability, a lower alpha coefficient may be acceptable as a minimum standard, as the homogeneity of this population of nurses likely resulted in a lack of differences in their responses. This tool has not been validated to date in a similar population of registered nurses practicing in an acute care environment. It is, however, reasonable to assume that this tool will perform consistently in this environment.

Reliability reflects the consistency of the instrument in measuring the nurse's ability and competence in providing smoking cessation counseling. Reliability reflects the degree to which this instrument will give similar results for the same individuals at different times. Nominal responses, demographic data and data reflecting the health services characteristics were analyzed by Cronbach alpha coefficient and paired-student t-test. While there are several ways to measure internal reliability, the Cronbach alpha coefficient was chosen for this study because only one test administration was possible. Cronbach alpha coefficient measures internal consistency reliability and combines to form a single scale. The attributes identified in the survey can be broken into subscales to allow this mathematical calculation. The homogeneity of the subscales was then reflected. Internal consistency was measured to assess the stability of the survey tool.

Validity

The 'RX for Change' program has been evaluated for face and content validity (Suchanek Hudmon et al., 2003). The program has undergone prolonged evaluation, reconstruction and reevaluation (Suchanek Hudmon et al., 2003). After this internal construction and reevaluation, this program was sent out for a second round of external reviews by people including three tobacco researchers and two pharmacy professors (Suchanek Hudmon et al., 2003). At that time all program content was reviewed and revised to incorporate any suggestions, and changes were made based on available public health guidelines.

The 'RX for Change' was first evaluated for face validity and content. Six registered nurses were asked to provide input. Content validity index score sheets were provided to the group, along with questions designed to assess the relevance of the questions with the concept. The content Validity Index score of the 'RX for Change' was 84%.

Internal Validity

The internal validity is the basic minimum of control, measurement, and analysis procedure necessary to make the results of this study interpretable. Internal validity will allow the data to be analyzed and conclusions to be drawn. Internal validity involves securing adequate control over extraneous variables, selection procedures and measurement procedures.

External Validity

The external validity will allow for generalization of the results. The external validity of this tool is important. While there are a significant number of registered pharmacists in this country, the number of registered nurses having daily prolonged contact with patients is far greater. Therefore, the implementation of a smoking cessation program in the hospital setting has the potential to dramatically affect tobacco use rates.

Educational Intervention

The educational intervention that was provided consisted of both lecture and workshop type activities (Table 5). The lecture modules that were included as part of the intervention encompassed the epidemiology of tobacco use, forms of tobacco, pharmacology of nicotine and principles of addiction, drug interactions with smoking, assisting patients with quitting, physiology of the tobacco-related diseases, genes and tobacco use, how to get involved, and a history of tobacco control efforts. After the lecture portion of the course was completed, core and optional workshops was included. The first half of the workshop session teaches skills for assessing needs for quitting; the second half is a role playing with case scenarios. To ensure consistent application of this program, the original authors of ‘RX for Change’ provide, at no cost to the study, over 300 Microsoft PowerPoint slides of core and optional modules, ancillary notes, case studies, and vignettes; each slide includes instructor notes and full citations.

Table 5

Educational Modules

Component	Module	Recommendation
Lecture 3 hours	Introduction (10 min) Epidemiology of tobacco use (15 min) Forms of Tobacco (15 min) Nicotine Pharmacology & Principles of Addiction (20 min) Drug interactions with smoking (10 min) Interviews with Tobacco Users tape (10 min) Assisting patients with quitting (40 minutes) Triggers tapes (10 min) A History of Tobacco Control Efforts (10 min) Pathophysiology of tobacco-related disease (20 min) Post cessation Weight Maintenance (15 min) How to Get Involved (10 min)	Required Required Recommended Required Required Required Required Required Required Required Required Required
Workshop 1 hours	Aids for Cessation (30 min) Role playing with case scenarios (minimum, 30 min) **Includes trigger tapes and videotaped counseling **sessions with debriefing	Required Required

Table 5 represents the material that was included in the educational intervention. A brief description of the content of each of the modules follows.

Epidemiology of tobacco use was given participants and understanding of the current prevalence of tobacco use in the US. A description of the compounds in tobacco and potential harm to humans was provided. Pregnancy related health risks were addressed. A description of the health risks of second hand smoke was provided. Finally, benefits of smoking cessation were addressed.

Forms of tobacco were covered to enhance the participants understanding of the six types of tobacco patients may be utilizing. To establish a basis for group understanding the number of cigarettes in a pack and the amount of nicotine contained was elaborated on. The specific health consequences of spit tobacco were described.

Nicotine pharmacology and principles of addiction was discussed in a 30 minutes session. The specific pharmacokinetic profile of nicotine was described with regard to metabolism, excretion, absorption and distribution. The participants were allowed to develop an understanding of the effects nicotine has on the central nervous system. Nicotine withdrawal symptoms and duration was described. The participant was exposed to lay terms utilized to describe these symptoms and common treatments.

Drug interaction with smoking was addressed. In this session participants were taught to identify key factors that increase likelihood of stroke, myocardial infarction and thromboembolism in women who smoke while using contraceptives. Participants were taught to evaluate patients' current medication list for potential interactions with tobacco consumption and become knowledgeable about medications that require dose adjustments.

Assisting patients with quitting was addressed using the National Cancer Institute's 5 A's, (Ask, Advise, Assess, Assist, Arrange). Key counseling strategies were address for patients who are not ready to quit. The Tobacco Cessation Counseling Guide sheet was introduced to assist participants in developing and understanding of what to discuss with patients who are ready to quit. Participants were instructed on how to teach patients to use the Tobacco Use Log. Participants were taught cognitive and behavioral strategies needed for quitting. Participants were taught how to arrange follow up for patients.

History of tobacco control efforts was taught to improve participants' social awareness and to promote political activism to improve community health. The participants were made aware of the Framework Convention on Tobacco Control. CDC recommendations for tobacco control programs were covered to enhance understanding of participants about the federal government's role in public health.

Pathophysiology of tobacco related disease was covered to improve the nurse understanding of illness effects on individuals. Specific adverse effects were covered both general effects along with cardiovascular effects. Carcinogens that are present in tobacco smoke were covered. The physiologic effects of smoking on pregnancy and prenatal complications were also included.

One of the primary concerns of individuals attempting smoking cessation is weight maintenance. Clarification about the anticipated weight gain and specific strategies to minimize weight gain was covered. Physical activity as a way to diminish weight gain and appropriate teaching strategies were covered.

Aids for Cessation include pharmacologic and non pharmacologic strategies that the dcRN can use to improve patient success with smoking cessation. Counseling techniques were taught to assist the dcRN. Specific interventions about nicotine replacement therapy and drugs to diminish cravings were taught. Efficacy information was provided to assist the dcRN with counseling patients. Economic information about the cost of continued tobacco use as compared with cessation medications was provided. The dcRN was given strategies to assess appropriateness of combination therapy.

The final session was role playing with case scenarios. This allowed the dcRN an opportunity, under guidance, to utilized strategies learned. The dcRN was able to utilize the scenario with a partner to increase confidence in using the newly acquired skills in practice.

The length of the program was 4 hours. All topics were covered and the participants were provided the handouts along with the tools needed for implementation into practice. The success of the educational opportunity was evaluated with a post test that was given immediately

following presentation of the entire program. The program was also evaluated using an institutional program evaluation form.

Ethical Considerations

IRB approval process

Prior to implementation of the study, the full proposal was evaluated by the Washington University Investigational Review Board. After review of the proposal, recommendations and all necessary changes were made. Once approval had been granted, the proposal was reviewed by the University of Missouri St. Louis Institutional Review Board. No recommendations for changes were made and the project was implemented as submitted. After full approval has been granted, the study commenced.

Protection of Human Subjects

Participation in the study was strictly voluntary. Voluntary consent could have been withdrawn at any time with no adverse affect on employment status. All collected study information was viewed and evaluated only by the principle investigator. No identifiable information with regard to current smoking status of nurse participants was disclosed. Only de-identified collated data will be published. Assurance of confidentiality of data was provided to all participants. All data collected was kept offsite in a locked cabinet and not available to anyone other than the principle investigator. The study material will be kept for the required five year period, as required, then destroyed.

Nurses were recruited based on their regular ongoing contact with hospitalized patients. No regular permanently based nurses were excluded from participation after having met the inclusion criteria. Information was gathered about the participants' current smoking status, so correlations could be made and the impact assessed of their ultimate willingness to give smoking

cessation advice. The information was kept off site in a locked file cabinet and no identified information will ever be available to the employer that could affect employment, insurability or create an otherwise negative work environment. While confidence in interacting with patients to provide health behavior change was evaluated, this information will only be published in de-identified form, so no nurse-specific information will ever be available that could create a negative impression of the staff.

All pre-test and post-test answers were entered into a secure database, viewed only by the principle investigator. All data reports were in de-identified manner. All follow up post-test data were correlated by matching the self selected number known only to the participant to ensure confidentiality.

Auditing of the Multidisciplinary Discharge Form and the incidental notes was performed only by the principle investigator. The only information recorded was whether the smoking cessation portion of the discharge education was completed or the staff member charted an incidental note. This data was kept in a secure database, without patient identification information attached. The data will not be attached to a specific nurse and will not have an effect on current employment. The reporting of the data will only occur as a percentage of the total number of patients cared for by nurses who have documentation of having participated in the educational session.

Compensation for Participation

The nurses attending the class were not compensated for their time, the only compensation was nominal; a $ 4.00 meal voucher for completing the entire study. Awarding Continuing Education Units for the class is currently an accepted practice and is not required by the state of Missouri, so this should not be considered an important enticement to participate in

the educational intervention. Providing a total of 4 points utilized for participation in the professional nurse development program should not be excessive or interpreted as enticement since participation in the program is voluntary. Attending this class will not be viewed as favorable toward promotion and will not significantly advantage the participants in job advancement.

Since there is no current data on using the *'RX for Change'* curriculum with dcRN, there are no known disadvantages to patients. There is no current data using the *'RX for Change'* curriculum with the dcRN and therefore there should be no disadvantage to the control group. The recruitment for the study will occur within the hospital. However, Nurse Managers will not be specifically made aware of which nurses volunteer to participate in the study. Therefore, there should not be preferential treatment to either those who choose to participate or those who do not. The educational session will occur during off work hours, thereby not interfering with work schedules.

Potential Threats to Internal and External Validity

Potential threats to internal validity:

The first threat is to history, which occurs when the observed effect is due to some event, other than treatment, that occurred between pre and post test. History could affect the intervention group since two to four weeks could lapse between enrollment and the intervention. Smoking cessation is a very active topic in healthcare and it is possible that an unanticipated educational intervention could occur that could affect the outcome. This could also potentially occur in the control group, since weeks will lapse between pre and post test. In addition a total of six weeks will lapse between enrollment and class participation for the intervention group. All participants were asked if they have engaged in any intensive self or formal education on the

topic of smoking cessation education. If this has occurred, the participant was excluded at that point from participation.

The second potential threat is maturation. Neither group should be disproportionately affected since random assignment to each group will occur and the entire intervention occurs over such a short period of time, a total of 10 weeks to completion of the project.

The third threat is testing. The intervention group may have a higher score on the second post test given 6 weeks following the intervention and will have had time to investigate the information. There should be no excessive testing effect on the control group since they will not have had exposure to the post test.

Instrumentation should not threaten the internal validity since the testing instrument will not undergo any changes during the process. The pre-test and post tests have been validated in similar groups and there is no reason to anticipate a need to change the instrument.

Regression could occur in the intervention group if during the class room intervention there is high interest and participation which creates high scores on the initial post test. The six weeks that lapse may cause a regression to score closer to the mean. The pre test and post test given to the control group without any educational intervention may reveal a lower than anticipated score since it will not be associated with an educational intervention.

Mortality in the group should be minimal as the frequent and consistent contact with the enrolled nurses should minimize this issue. However, a small dropout must be anticipated and is accounted for by over enrollment, power analysis suggests $N = 60$ and planned enrollment is $N = 66$. This may occur if there is a differential dropout rate among intervention and control group, creating a post hoc selection bias.

The final threat to internal validity is selection bias, observed due to differences in the kinds of people in the groups. This should be minimized by random assignment to the intervention and control group. The larger issue of selection bias as affect of self selection into the study may ultimately make generalization difficult as the people who choose to participate may be more motivated to make the necessary behavior changes and make the educational intervention appear more successful than it would be in the general nursing population.

Social Threats

The first is Reaction to Focused Inequality, which may occur if the control group finds out about the educational intervention and in an attempt to equalize the groups begin self study.

The second is Compensatory Rivalry. This exists if the control group views themselves as underserved and works harder to achieve higher scores. This could become an issue if the control group feels they are being slighted and over study to compensate for the differences between the groups.

Resentful demoralization occurs when the comparison group feels neglected. This should not occur since no specific advantage to the intervention is known. All efforts were made to keep the groups separate. There should not be any rivalry between the groups.

The final threat is Compensatory Equalization of Treatment. This has been seen to occur when institutional administrators see an inequity and give more to the comparison group. The design of this educational intervention is such that there is no known difference between groups. Administration will have no knowledge of the participants of each group and will not have the ability to overcompensate the control group.

Threats to External Validity

The first potential threat to external validity is reactive arrangements. This is the degree to which the experience of participating in the study may enhance or diminish effects relative to replication of intervention in a non-research context. There is a concern that nurses who self select to participate in educational interventions may be more motivated to interact with patients to promote behavior change, and therefore any change measured may be higher than can be expected in the general population of nurses.

Testing Treatment interaction may be affected, which is the degree to which experience of taking pre or post measures enhances or diminishes impact of the intervention. This may limit generalizability to broader application of this intervention in non evaluative situations when testing will not be performed. The control group will complete the pre-test and post-test without any specific intervention but with a 6 week delay between the tests. Since no specific actions occurred to keep the participants from the same floor from enrolling, it is possible that members of the control group and the intervention group will work on the same floor and the same shift there is the possibility of the intervention group mixing with the control group which could result in the school bus effect. Every effort was made to reinforce the need for confidentiality on the part of all participants to minimize this occurrence.

There may also be a selection-treatment interaction, which is the degree to which population enrolled in the evaluation is more or less likely to respond to the treatment relative to the general population. This concern is that nurses who are current smokers may be reluctant to participate in this educational intervention for fear of peer ridicule on the topic. This may produce bias in the study, making replication more difficult.

The final threat to external validity is multiple treatment interference, which is the degree to which existence of pro-health activities not formally part of the experimental intervention in the hospital may influence effects. It is possible, since tobacco use and smoking cessation are important to the hospital's compliance with The Joint Commission requirements that an educational intervention may be occur during the conduct of this study.

CHAPTER 4 – DATA ANALYSIS

Data Analysis

This chapter presents the results. The participants are described, including their characteristics, baseline differences between the groups, and test reliability and validity. The post-test results are presented and discussed. Each research question, with specific findings related to it will be presented. This chapter concludes with a summary of the findings.

The study used an experimental design. SPSS 17 was used to enter, validate and analyze the data. Although contamination was a potential difficulty, all dcRNs who were eligible to participate were randomly assigned to treatment and control conditions without regard to their employment area (surgery or medicine). No nurses transferred from one unit to another during the study. However, there were instances of nurses being reassigned to other units to address immediate staffing requirements. DcRNs who were assigned to the permanent 'float' pool did participate. However, their unit assignments did not change during the study period. Contamination effects were likely minimized due to the short duration of this study.

Initially, 132 dcRNs volunteered to participate. These were randomly assigned to treatment or control conditions. However, despite selecting the date and time to participate in the intervention, there was lower than expected attendance. A second recruitment effort was implemented with simple random assignment to treatment and control conditions (Table 6). The second recruitment was concluded when the estimated power requirements for the study were met. Despite these efforts, the number of participants in the treatment arm was less than estimated to attain sufficient power.

Table 6

Treatment Group Recruitment Results

Class Date	Number Enrolled	Number Attending
4/18/2009	22	18
4/20/2009	20	14
4/25/2009	24	7
5/2/2009	12	6
5/4/2009	12	6
5/9/2009	9	4
Cancelled prior to confirmation	6	n/a
Total	**105**	**56**

*this does not include the Control Group

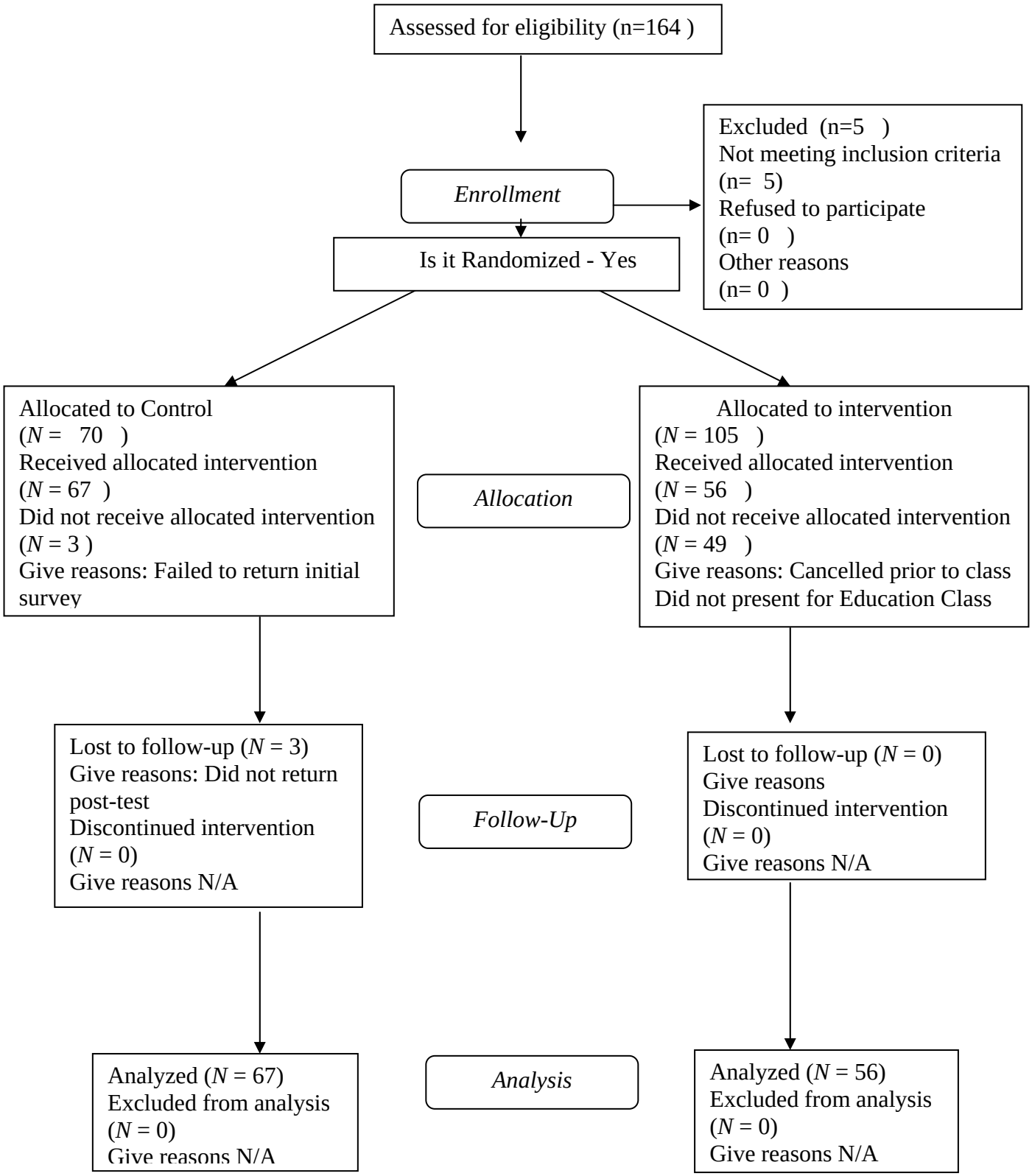
Human Subjects

The procedures to protect the rights of human subjects were implemented as described in Chapter 3. No problems or confidentiality issues were observed or known. The letters provided to potential participants (dcRNs) are included (Appendix B and C). Potential participants (dcRNs) were assured that nonparticipation would have no implications with regard to their current employment. The participants (dcRNs) remained anonymous because they chose their study identifying number which was used to link their pre-training and post-training surveys. The control group participants only completed both a pretest and post test and the same anonymity was maintained by the participants self selecting a unique number. Names attached to codes were kept in a locked file cabinet accessible only to the researcher and were destroyed upon completion of the post-test.

The patient participants were anonymous as no personal identification was abstracted from the patient charts. The abstracted information included discharge instructions and/or incident information only.

Figure 5 describes the allocation of the participants (Moher, Schulz, & Altman, 2001). A total of 164 people were randomly allocated to treatment and control conditions. At the end of the study, there were 56 participants in the intervention group and 67 in the control group. These numbers include only participants who completed all aspects of the study design. The analysis of the study questions included these participants only.

Figure 5. *Recruitment Allocation*



Descriptive Results

Socio-demographic and personal smoking history were analyzed to determine frequencies and means. Comparison between the usual care group and intervention group was made to note any differences between the groups. The overall alpha coefficient was calculated to determine internal consistency of both subscales 5 A's, Ask, Advise, Assess, Provide assistance and Arrange follow up and the confidence to intervene subscale was evaluated for both the control and intervention groups. An evaluation was made of the pre-test and post test knowledge gained in the control and intervention group and correlations made.

Demographic Comparisons

Table 7 summarizes the distributions of participants according to type of nursing unit, sex, ethnicity, age and level of nursing education. Chi-square test for independence was utilized to appraise differences between control and intervention participants and to evaluate the results of the randomized assignments. No significant differences were noted based on these characteristics. Thus, randomization appeared effective for this study. With respect to nursing education or highest degree attained, the intervention group had slightly more education but this observation was not statistically significant.

Table 7

Demographic Findings

	Control *N* = 67 (%)	Intervention *N* = 56 (%)
Specialty		
Medicine	*n* = 29 (43%)	*n* = 26 (46%)
Surgery	*n* = 38 (57%)	*n* = 29 (52%)
Sex		
Male	*n* = 6 (9)	*n* = 5 (9)
Female	*n* = 61 (91)	*n* = 51 (91)
Ethnicity		
Caucasian/White	*n* = 46 (69)	*n* = 41 (73)
African American	*n* = 13 (19)	*n* = 11 (20)
Hispanic/Latino	*n* = 2 (3)	0
Asian/Pacific Islander	*n* = 5 (8)	*n* = 2 (4)
Other	*n* = 1 (2)	*n* = 2 (4)
Age		
Mean (s.d.)	*39.4 (10.9)*	*41.2 (13.6)*
Range	*22-62 years*	*22-67 years*
Nursing Education (%)		
Diploma	*7 (10.4)*	*4 (7.1)*
ADN or ASN	*23 (34.3)*	*15 (26.8)*
BS or BSN	*36 (53.7)*	*33 (58.9)*
MS or MSN	*1 (1.5)*	*4 (7.2)*

Smoking History

Smoking history of all participants was self reported and is summarized in Table xx. Control participants were more likely to report ever smoking and having quit smoking and intervention subjects were more likely to report prior experimentation with smoking. However when these were evaluated using Chi-square test for independence, these differences were not statistically significant.

Table 8

Self Reported Smoking History and Frequency

		Control (%)	Intervention (%)
Smoking History			
Ever Smoked	**Yes**	**23 (34.3)**	**16 (28.6)**
	No	**44 (65.7)**	**40 (71.4)**
Smoking Frequency	**Never**	**28 (41.8)**	**17 (30.4)**
	Daily (Current?)	**7 (11.5)**	**3 (5.4)**
	Experimented	**18 (26.9)**	**25 (44.6)**
	Used but Quit	**14 (20.9)**	**11 (19.6)**

Participant's Evaluation of the 'RX for Change' *Training*

The dcRN's who participated in the 'RX for Change' training were asked to evaluate the training session. Participants reported that 60 percent of the content was new information, 32 percent was not new but needed to be reviewed, and 12 percent reported that the information was neither new nor was the review needed. 'RX for Change' participants also estimated that 79% of the material would be used to provide care to patients who report smoking. Fifty-seven percent of these participants reported that their smoking cessation counseling would increase following their 'Rx for Change' participation. An additional 32 percent indicated that they would probably engage in more smoking cessation counseling and 7 percent reported they were not sure. 'Rx for Change' participants also reported that they felt the quality of their smoking cessation interventions would change with 73% indicating that it would improve, 18 % felt it would probably improve and 4 percent felt quality would not change.

In general, participants were satisfied with the 'Rx for Change' training session as indicated in Table 9. Generally, these participants were very satisfied with the 'Rx for Change' training session as the ratings are generally excellent except possibly regarding the physical facility where the training occurred.

Table 9

Participant's Ratings of 'Rx for Change' Training

	Excellent	Good	Fair	Poor
Presentation Skills	*n* = 45 (76%)	*n* = 5 (9%)	*n* = 5 (9%)	0
Presenter's Knowledge of the Subject	*n* = 48 (81%)	*n* = 2 (3%)	0	0
Organization and Clarity of Content	*n* = 47 (80%)	*n* = 3 (5%)	0	0
Effectiveness of Teaching Methods	*n* = 45 (76%)	*n* = 5 (9%)	0	0
Overall Speakers Rating	*n* = 46 (78%)	*n* = 4 (7%)	0	0
Overall Rating of the Physical Facility	*n* = 40 (68%)	*n* = 10 (17%)	*n* = 1 (2%)	0
Overall CEU rating	*n* = 45 (76%)	*n* = 6 (10%)	0	0
The individual objectives relate to the overall purpose/goal of the CEU	*n* = 51 (86%)	0	0	0

Self Reported Smoking Intervention Ability

Prior to implementing the 'RX for Change' program, all participants rated their ability to implement a smoking cessation intervention with patients who report that they smoke. All participants were also asked 45 days following the last training session to rate their ability to intervene with patients who report that they smoke. Participants who completed the 'Rx for Change' training were also asked to appraise their ability to intervene with patients who report that they smoke before and following the 'RX for Change' training. These findings are summarized in Table 10. The mean self rating for the intervention group increased from 1.83 (sd .89) to 3.76 (sd, .83) with excellent ability ranked as high (p=.0001). The mean self rating for the control group, on the initial survey was comparable with the intervention group 1.86 (sd .92), however it was not possible to obtain a post test rating on this group due to question wording. The question was worded that the participant needed to rate their ability based on completion of the course, since no course work was completed participants skipped this question.

Table 10

	Control Group N=67	Control Group Delayed Posttest N=40	Intervention Group N=56	Intervention Group Delayed Post-test N=55
	Pre-test (%)	Post-test (%)	Pre-Test (%)	Post-test (%)
Poor	13 (19)	5 (7.5)	16 (29)	1 (1.8)
Fair	29 (43)	12 (18)	26 (21)	3 (5.4)
Good	14 (21)	14 (21)	12 (21)	23 (41)
Very Good	6 (9)	9 (13)	2 (4)	23 (41)
Excellent	5 (8)	0 (0)		5 (9)

'Rx for Change' *Instrument Evaluation*

Analysis of subscales

The mean scores on the overall 'RX for Change' and its subscales were calculated. The first subscale evaluated was the 5 A's. Ask, Advise, Assess, Provide assistance and Arrange follow up. The subscale was evaluated for the intervention and the control group separately and no difference was found between the two groups (Table 11).

Table 11

Reliability Statistics Intervention and Control Group 5A's Pre-test Subscale

Group Assignment	Cronbach's Alpha Based on Standardized Items	*N* of Items
Intervention Group *N* = 56	.841	5
Control Group *N* = 67	.837	5

The next subscale evaluate was the confidence to counsel patients as needed (Table 12). This is a subscale that consists of 10 separate questions intended to ascertain the participant's confidence level. It evaluates confidence to know the appropriate questions to ask, have the needed skills, provide motivation, skills to monitor patients during quit attempt, have sufficient therapeutic knowledge, create patient awareness, sensitively suggest tobacco cessation, provide adequate counseling, help quitters learn to cope and counsel patients who are interested in quitting.

Table 12

Reliability Statistics Intervention and Control Group Confidence Pre-test Subscale

Group Assignment	Cronbach's Alpha Based on Standardized Items	N of Items
Intervention Group *N* = 56	.927	10
Control Group *N* = 67	.886	10

An evaluation of the 45 day delayed post test data was conducted to evaluate the Cronbach's Alpha for stability (Table 13). The Cronbach's Alpha was .883 which was stable compared with the initial pre-test and post-test data.

Table 13

Reliability Statistics Intervention and Control Group Confidence Subscale Late Post-test

Group Assignment	Cronbach's Alpha Based on Standardized Items	N of Items
Combined Group *N* = 123	.883	11

Comparisons of test scores before and after the educational intervention were made on the control group to note a learning effect of the intervention. Summary score was created for the skill content area. Skill represents the subscale of the 5 A's, Ask, Advise, Assess, Provide assistance and Arrange follow up showed significant improvement after experiencing the educational intervention (p= .0005).

Confidence Subscale

Confidence represents the subscale of the 10 questions which are; know the appropriate questions to ask, have the needed skills, provide motivation, skills to monitor patients during quit attempt, have sufficient therapeutic knowledge, create patient awareness, sensitively suggest tobacco cessation, provide adequate counseling, help quitters learn to cope and counsel patients

who are interested in quitting also showed significant improvement (p= .0005). Summary score was created by combining the 12 items pertaining to confidence in counseling patients to quit.

Knowledge Subscale

The ability to help patients quit smoking and help prevent patients from starting smoking was also evaluated using a *t* test (mean -0.18, p=.811). Knowledge gained was evaluated with a *t* test between the pre-test and delayed post-test interval. The pre-test mean for the control group was 5.94 (SD, 1.39) for the intervention group it was 5.17 (SD, 1.61). The post test mean for the control group was 4.71(SD, 2.33) and for the intervention group it was 7.44). (Table 17).

Table

The 'Rx for Change' training is intended to improve ability to implement smoking cessation interventions with patients. Prior to implementing the 'Rx for Change' training, the differences between these control and intervention participants were minimal. T-test results indicate that this difference was not statistically significant The ability to help patients quit smoking and help prevent patients from starting smoking was also evaluated using a *t* test (mean -0.18, p=.811). Knowledge gained was evaluated with a *t* test between the pre-test and delayed post-test interval. The pre-test mean for the control group was 5.94 (SD, 1.39) for the intervention group it was 5.17 (SD, 1.61). The post test mean for the control group was 4.71(SD, 2.33) and for the intervention group it was 7.44). (Table 14).

Table 14

Self Report of Study Results

Scale	Range of Scores	Pre-training M (SD)	Post-training M (SD)	Average Difference (Post-training-Pre-training)	*p* value
Skill	6 to 30	14.7(4.59)	18(3.99)	3.3	.0001*
Confidence	12 to 60	22.7(7.15)	38.09(13.97)	15.39	.0001*
Knowledge	0 to 10	5.18(1.61)	7.45(1.42)	2.27	.0001*
Activity	2 to 6	2.42(.84)	5.73(21.9)	3.31	.881
Ability to help pts quit	1 to 5	2.0(.81)	3.82(.79)	1.82	.0001*

**statistically significant (at what level of significance??)*

Chart Audit-Patient Outcomes

Six weeks following the 'Rx for Change' training, patient assignments for each participant were requested. However, this information was available for only 51 of the 56 'Rx for Change' participants. The electronic patient records for the individuals assigned to these dcRN's were requested and, when available, were audited. The incidental and multidisciplinary discharge notes were examined to determine the patient's smoking status and whether there was any indication of a smoking cessation intervention among patients who self reported smoking. This resulted in 624 patient charts and 173 (28%) indicated that the patient self reported current smoking at the time of the admission assessment. Of these smoking patients, 73 (42%) of their charts indicated smoking cessation intervention. Prior electronic records did not incorporate an option to indicate smoking cessation intervention so it is not possible to make pre- and post-comparisons.

Post-hoc Power Estimation

The power analysis was repeated to assess for adequacy of group size. Informed by these findings, an overall sample size of 200 would achieve 46% power to detect an effect size of .15

using a 2 degrees of freedom Chi-Square Test with a significance level (alpha) of .05. To reach the 80% recommended power a sample size of 500 would be needed to detect an effect size of .15 using 2 degrees of freedom Chi-Square Test with a significance level (alpha) of .05. Thus, although this study was underpowered, the effect size was much larger than anticipated.

Results for each Research Hypothesis

1. Smoking cessation intervention knowledge deficits exist and an intense educational intervention (Rx for Change*)* will diminish the knowledge deficit. The pre-test mean score was 5.17 (SD, 1.61) and the post-test mean was 7.44 (SD, 1.41), (p=.0001).
2. An intensive educational intervention (Rx for Change*)* on the topic of smoking cessation will increase the dcRN's confidence in their ability to intervene with currently smoking patients. Confidence was evaluated using a *t* test between the pre-test and immediate post-test given on the day of the educational intervention (mean 14.13, p = .0005)
3. Intensive education (Rx for Change*)* on the topic of patient education about smoking cessation will be retained for 45 days following the intervention. The retention of material was evaluated by comparing mean pre-test scores of the intervention group 5.17 (SD, 1.61) and mean immediate post test scores of the intervention group 7.45 (1.42). The immediate post-test scores of the control group were then compared with the delayed post-test scores of the control group 7.44 (SD, 1.41).
4. Following intensive smoking cessation training, dcRNs will consistently chart smoking cessation interventions with patients who report smoking. As evidenced by the dcRN charting specific comments about the assessment of a patients' stage of change. Charts of nurses in the control group were audited. Patients who were cared for by nurses in the control group underwent a screening audit to assess for smoking status on admission (*N* =

624). Those patients who self identified as currently smoking on the admission profile (*n* = 173, 28%) underwent further audit. All incidental notes, or the Multidisciplinary Discharge Form were audited. The results of that audit recorded a positive intervention of adequate charting if the nurse indicated the appropriate stage and intervention for the patient (*n* = 73, 42%).

5. Results of intensive education (Rx for Change*)* will be similar to those reported with pharmacists and undergraduate nursing students. No data from the knowledge portion of the pharmacy literature exists. The dcRN's showed similar increases in the confidence and skill subscales when compared with the undergraduate nursing students (Butler et al., 2009). The dcRN group had no improvement in the ability to intervene to promote smoking cessation or in helping patients quit (p=.881), while the undergraduate nursing students showed an improvement (p=.03) in the subscale of activity (Butler et al., 2009).

Summary

This chapter reports the findings from this study. This complex evaluation of baseline nurse's knowledge, along with the post intervention knowledge, allowed for evaluation of the educational strategies. Pairing this information with the completion of the discharge instructions allows recommendations for change in educational strategies for nurses.

CHAPTER 5 - DISCUSSION

Summary of the Problem

A randomized controlled trial was utilized with a group of direct care registered nurses to evaluate the utility of the 'RX for Change' educational intervention. The purpose was to assess the efficacy of a short educational intervention to improve both knowledge and confidence of dcRNs to intervene with hospitalized patients to promote continued abstinence after discharge. Utilization of this method showed that a 4 hour educational session improved both knowledge on the subject (p=.0001) and confidence to utilize the information in practice (P=.0001). No previous literature was located that shows both an increase in knowledge gained and increase in confidence to utilize the information to promote smoking cessation by dcRNs with hospitalized patients. The subsequent chart audit data further supports the behavior change experienced by dcRNs in using the information with hospitalized patients.

Continued tobacco use continues to be a leading health problem in the U.S. resulting in 430,000 preventable deaths each year (CDC, 2002). Nursing has invested in health promotion strategies that impact the health their patients and their communities. Thus it is reasonable to assume nursing would be actively involved in reducing or resolving this health crisis. In 2008, The Joint Commission (TJC) began promulgated regulations which required health providers/hospitals to evaluate patients' smoking status upon admission to hospitals, while this is a voluntary accreditation agency most hospitals participate, (TJC, 2008). Because patient admission assessments are completed by dcRN's, this became an issue for hospitals to maintain their charting to pass future accreditation. Subsequently, TJC began to require dcRNs nurses to not only inquire smoking status upon admission but also intervene with patients hospitalized for acute myocardial infarction, congestive heart failure and pneumonia to promote abstinence from

tobacco products to improve health outcomes (The Joint Commission, 2008). Concurrently, the National Quality Forum (NQF) developed 15 nursing-sensitive outcome measures. These include patient, nurse and administrative nursing outcomes. The nurse specific measures include smoking cessation counseling for patients admitted with acute myocardial infarction, congestive heart failure and pneumonia.

Purpose

The primary purpose of this research was to evaluate the efficacy of 'RX for Change', a theory based smoking cessation training program with dcRNs. This program was developed by and has been utilized in pharmacy academic programs, pharmacists and in one undergraduate nursing program but has not been studied in dcRN's who could deliver this care.

To address this, we planned and implemented a randomized clinical trial with dcRN's who met the inclusion criteria. Randomization occurred at the individual level with all volunteer participants. Although there were some differences in the composition of the control and treatment groups in terms of demographic variables, this was evaluated statistically and significant differences between the groups were not observed.

The dcRN's in the treatment group received the 'Rx for Change' training program which was designed based on the Transtheoretical Model and focused on providing the information professional need in order to intervene effectively with individuals who smoke, including, in this case, adult patients who were admitted to a hospital in the Midwest. The pre-test and post test knowledge, attitudes and confidence were compared with similar date from dcRN's who did not receive this training. The change in their post-test scores was significant overall and in all subscales except in the two questions that asked if the nursing profession should be more active or less active in helping patients quit smoking and in preventing patients from starting smoking.

Due to the wording of these questions the vast majority of participants felt that nursing should be more active in both areas. This data did not improve after the intervention due to a floor effect of the data and the negative connation of answering that nurse should be less active.

In general, the intervention group reported that they were pleased with the content and the presentation of the smoking cessation information. Thus, this program as modified for this project, was well received by those who attended. The authors of the previous studies with registered pharmacists and undergraduate nurses did not report on this data.

Hypothesis Results

Appraisal of the training program was conducted with the intervention group to establish usefulness to practice. Participants estimated that 60% of the material was completely new, 32% was not new but needed to be reviewed and only 12% of material provided was unnecessary. This compares with the pharmacy cohort in whom 73% reported this as completely new, 18% had been taught before but needed review and 9% felt it was unnecessary (Hudmon et. al., 2003). Further 79% of the dcRN participants reported that the material would be used when providing patient care, compared to 73% of pharmacy students (Hudmon et. al., 2003). In evaluating the quality of counseling they would provide, 73% responded that participating in the class improved quality. Participants self-reported pre- and post-training abilities to help patients quit using tobacco increased significantly, from 1.93 (SD, 0.85) to 3.82 (SD, 0.79) (t_{55}=17.67; p=.0005). This data is consistent with data reported by Hudmon, et al., (2003) as a result of training.

Chart audit data was obtained and analysis revealed a charting compliance rate of 42%. Since this was a voluntary change is charting procedures the compliance rate is likely to be lower than would be expected of required or mandated charting. Voluntary compliance response rates of 30% in survey return are generally considered acceptable. The previous hospital audit data

from 2006 for compliance with charting smoking cessation counseling on discharge notes was between 14-33%, C. Davis (personal communication, June 22, 2009), therefore the current findings represent a significant increase in compliance rates making this clinically significant.

Limitations of the Study

Nurses self selected to participate in the study and may have created a selection bias. The statistical significance achieved with this group of dcRNs may not be reflective of the entire group of nurses once mandated to attend. There may be reluctance of the larger group to become involved in the process of smoking cessation counseling.

The no show rate in the intervention group was higher than expected requiring a second recruitment effort. This second recruitment may have created another bias as the first three educational sessions had already occurred. It is possible that the second wave recruits had heard about the content of the class and therefore were unduly influenced to participate.

Another limitation is the short interval between completion of the training and determination of the outcome – eg, that nurses self reported implementing what they learned. This effect may disappear when ascertained 6 or 12 months post training program.

The initial power analysis conducted, based on previous work done, estimated that there would need to be 60 participants in each group. The intervention group fell short of that number N = 56 in the final analysis, total recruitment for both groups N = 123. For that reason a post hoc power analysis was conducted utilizing the data collected for the study. Based on the Chi-Square Test to obtain 80% power and detect an effect size of .15 there would need to have been 275 in the control group and 225 in the intervention group. As the difficulty in recruitment occurred with a much smaller sample size, recruitment of a higher percentage of the total staff would require additional staff incentives to achieve.

No financial compensation was available to award to nurses for attending the 4 hour educational session. This lack of remuneration may have been a deterrent to attending the class. The $4.00 meal voucher and the possibility of winning the raffle was possibly an inadequate enticement to fulfill participation intent. The provision of PNDP points did not result in immediate compensation therefore may have been undervalued as an incentive.

Small sample size and duration of recruitment in the intervention group are also limitations. The original power analysis indicated the need for 60 participants and the final cohort consisted of 56. The higher than expected no show rated may have limited the data analysis in two ways. First, the recruitment time was longer than anticipated which could have allowed for cross contamination between the intervention and control groups. Secondly, the statistical analysis may have been affected by the small sample size.

There was no direct measure of impact on the patients to see if the interaction with the nurses who attended the intervention made greater impact. The proxy measurement of charting is only an indirect measure of potential change. A more rigorous approach would involve direct contact with patients who received the additional intervention to see if there was an increased incidence of sustained post discharge abstinence.

Implications for Research

There are no current studies that evaluate an educational tool that can be utilized on a large scale to educate and adequately evaluate the complex situation of tobaccos effect on the body and evaluate a dcRNs response to the educational program. Further research needs to be done with bedside nurses and compliance with smoking cessation patient education. The current study and resultant data may be difficult to generalize due to small sample size.

Utilizing the Transtheoretical Model to further research the dcRN and their understanding of the Stages of Change and measure of their ability to intervene with currently smoking patients needs to be further studied. The 'RX for Change's educational program has in it the Transtheoretical Model and as such has merit for further study to see if more widely implemented could ultimately impact smoking rates in patients. Further research could also be done utilizing the Transtheoretical Model with dcRNs to see if after exposure to this content and mastering the concept resulted in increased confidence in interacting with patients. Additional studies are needed to see if increased confidence results in decreased smoking rates of hospitalized patients after a period of time at home.

Future studies should include recruiting a more diverse group of dcRNs, both ethnic and gender diversity was not fully represented in this study to allow for conclusions and comparisons to be made. The group of dcRNs represented in this study group do not accurately represent the current ethnic makeup of the institution and may therefore make generalizing the study difficult.

This first study of the use of 'Rx for Change' with dcRN's supports for future exploration of this important topic in the profession of nursing.

Implications for Nursing Practice

The Board of Nursing in Missouri has not mandated continuing education as a prerequisite to continued RN licensure. Thus, it is possible for a nurse to graduate from a nursing education program and remain licensed without further formal or continued education. Although continuing education is not mandated by the Missouri Board of Nursing, accreditation standards for health care providers are currently mandating increasing standards for provision of care, including health promotion interventions such as smoking cessation. Nursing must evolve smoking cessation research past the point of identification of knowledge deficits. It is important

for dcRN's to become involved in smoking cessation efforts to stabilize and improve the health of the public served. Patients must be assessed for their current smoking status as required by current Joint Commission guidelines as a screening effort. Then nurses must be prepared and willing to intervene with patients that are smoking to promote smoking cessation. Current intervention strategies that promote smoking cessation and continued abstinence need to be developed, implemented and evaluated.

The Transtheoretical Model makes a solid foundation for nurses to base a deeper understanding of the addiction associated with tobacco use. The intervention group demonstrated the ability to learn the stages of change as evidenced by the statistically significant gained knowledge between the pre-test and post-test ($p = .0001$). The control group also was able to utilize the material to impact patient care as evidenced by the proxy measurement of charting, 42% of nurses' voluntarily charted interactions with patients to promote abstinence, or was more able to recognized patients who were not ready to consider quitting. This allows for more studies of dcRNs and their ability to intervene with smoking patients to promote smoking cessation.

The current study shows 'RX for Change' is effective and efficient when operationalized in a hospital setting with dcRNs. Hospital administrators can assist in the promotion of similar project to the entire staff to improve compliance rates.

Recommendations

This study had higher than expected no show rates for the educational intervention program. Securing funding to pay nurses salaries would likely improve completion rates for the study. Further instrument development and reliability testing in measuring the ability of nurses

to intervene with patients to help them quit smoking and to prevent patients from starting smoking needs to occur.

The 'RX for Change' program needs to be evaluated in other clinical environments where nurses interact with patients, including community hospitals. Further evaluation of the effectiveness of this program with nurses who provide care in outpatient settings would be useful. Additional studies incorporating the 'RX for Change' program into undergraduate education programs need to be conducted as they are limited at this time.

More longitudinal studies of dcRNs and their long term adoption of smoking cessation counseling are needed. A 45 day follow up is too short interval to assume long term sustainment of the educational intervention. Follow up directly with patients involved in the process would also add depth to the information. A more accurate assessment from the patients perspective about the smoking cessation intervention they received. More careful follow up of patients would also allow for assessment of any follow up that was provided to patients.

The sample that self selected to participate in this study under represents the number of nurses who smoke. Sarna & Lillington, (2002) reported that nurses who smoke are less likely to intervene with patients who smoke. The small number of current smokers in this study may make generalizabilty limited. Smokers in the control group (N =6) and in the intervention group (N =3) make it impossible to detect differences in post-training skill, confidence, knowledge, and activity between nonsmokers and smokers. Intentional recruitment of current smokers into the program would allow for fuller evaluation of the program and more accurate evaluation of the dcRNs intention to intervene. More studies are needed to evaluate the relationship between nurses' smoking status and intention to intervene with patients who smoke to promote cessation.

Future Research

Replication studies using the 'RX for Change' program for dcRNs need to be conducted for verification of results of this study. Larger studies with a more diverse group of nurses need to occur. Further research leading to the incorporation of a curriculum for full time dcRNs is indicated. Limited studies done at this time indicate that nurses who are currently smoking are less likely to intervene with patients who are smoker; more research is needed to explore this relationship more fully.

Conclusions

The 'RX for Change' educational program appears to be a solution to the current knowledge deficit nursing has with regard to tobacco use and smoking cessation. This program delivered in a four hour educational fashion allows for knowledge to be gained along with increase in skills necessary to deliver it to patients. The program also increases dcRNs confidence to interact with patients. The dcRNs in this study also reported and increased ability to interact with patients to help them quit or prevent starting smoking. The dcRNs in this study reported that they felt that nursing would benefit from this information being disseminated more widely.

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Appendix A

Intervention Group

Dear Registered Nurse:

As a nurse at Barnes Jewish Hospital in St. Louis, you have frequent and prolonged contact with patients who are hospitalized. A portion of these patients may be current cigarette smokers. I would like to invite you to participate in a research study intended to investigate the current knowledge level of the dcRN about the effects of tobacco on the human body. As well I would like to ascertain your current level of understanding about potential intervention strategies to promote smoking cessation. I am a doctorial candidate in Nursing at University of Missouri St. Louis, and this study represents my dissertation project.

Participation in this study will require filling out a questionnaire that contains 33 questions and should take approximately 25 minutes. You will then be asked to participate in an educational session lasting 4 hours for which you will be given Continuing Educational units. A follow up questionnaire would be given following completion of the class and would again take about 25 minutes. Six weeks following the educational intervention you will be asked to completed a follow up questionnaire.

All information obtained in connection with this study will remain confidential and will be used only for the purposes of the study. The surveys will be coded, and no individual will be identified. No individual data will be revealed to the management of the hospital. Information gathered will be compiled and reviewed as a summary score, protecting individual identities.

You are under no obligation to participate in this study. Your completed survey will be taken as evidence of your willingness to participate, and you consent to have the information collected used for purposes of the study. You may withdraw from the study at any time. Should

you choose not to participate, your employment at Barnes Jewish Hospital will not be affected in any way.

Please keep this explanation about the study for your records. If you have any questions concerning this study, please feel free to contact me. You may call me at (314) 583-3415 or my graduate advisor, Dr. Roberta Lee at (314) 516-6076.

Your response to this survey will be helpful in improving our understanding of the barriers to engaging in patient education about smoking cessation with a hospitalized patient. I greatly appreciate you taking the time out of you day to fill out and return the attached survey.

Sincerely,

Laura Bisch

Doctoral Candidate, College of Nursing

University of Missouri St. Louis

St. Louis, MO

Appendix B

Certificate

BARNES-JEWISH Hospital
BJC HealthCare

Barnes-Jewish Hospital
BJC HealthCare
1 Barnes-Jewish Hospital Plaza
St. Louis, Missouri. 63110

Certifies That

Maggie Ulione

Has Attended & Successfully Completed

Rx for Change: Smoking Cessation Intervention

Date: April 4, 2009

Location:
Barnes-Jewish Hospital
St. Louis, MO.

Contact Hours: 6.0

MONA Approval Number: 110-II

Activity Number: 202

CNE Activity Coordinator:
Laura Ochoa, RN, ANP-BC

Barnes-Jewish Hospital Center for Practice Excellence is an approved provider of continuing nursing education by the Missouri Nurses Association, an accredited approver by the American Nurses' Credentialing Center's Commission on Accreditation.

Appendix C

Schedule for ‘RX for Change’ Class

8:00 a.m.	Orientation to facility and schedule for the day
8:15 a.m.	Pre-Test given
9:00 a.m.	Epidemiology of Tobacco Use
9:20 a.m.	Forms of Tobacco
9:40 a.m.	Nicotine Pharmacology & Principles of Addiction
10:10 a.m.	Drug Interactions with Smoking
10:20 a.m.	Break
10:30 a.m.	Interviews with Tobacco Users tape
10:40 p.m.	Assisting Patients with Quitting
11:40	Triggers tapes
11:50 p.m.	Break
12:00 p.m.	Aids for Cessation
12:25 p.m.	Role playing with case scenarios
12:45 p.m.	Post test

Appendix D

Rx for Change: Clinician-Assisted Tobacco Cessation
PRE-TRAINING SURVEY

Note: Your responses are anonymous. However, we need the following information to "link" the forms that you complete for the training.

Unique ID number (easy to remember):_____
Nursing Specialty: Medicine _____ Surgery _____

What is the highest degree you have achieved. (CHECK ALL THAT APPLY)

_____**Diploma**	_____**Bachelors in other field**	_____**PhD**
_____**ADN**	_____**MSN**	
_____**BSN**	_____**Masters in other field**	

YOUR DEMOGRAPHICS

A. What is your sex? CIRCLE ONE NUMBER 1…Male 2…Female

B. What is your age? _____

C. Which of the following best describes your race or ethnicity? CIRCLE ONE NUMBER

1…Caucasian/White	4…Asian or Pacific Islander
2…African American	5…Native American
3…Hispanic or Latino	6…Other:_____

D. Have you smoked 100 or more cigarettes in your lifetime? CIRCLE ONE NUMBER

1…Yes
2…No

E. Which of the following best describes your tobacco use (cigarettes, cigars, pipes, snuff, or chew)? CIRCLE ONE NUMBER.

1…Use of tobacco once or more a day
2…Use tobacco less than once a day
3…Used to use tobacco but quit ► In what year did you quit? _____
4…Experimented with tobacco a few times in the past
5…Never tried tobacco

CIRCLE ONE NUMBER
1. How do you rate your overall ability to help patients quit using tobacco?

1	2	3	4	5
Poor	Fair	Good	Very Good	Excellent

2. Please rate you level of skills for the following aspects of counseling: CIRCLE ONE NUMBER FOR EACH ITEM.

	Poor	Fair	Good	Very Good	Excellent
a. Asking patients whether they use tobacco……	1	2	3	4	5
b. Advising patients to quit using tobacco…….....	1	2	3	4	5
c. Assessing patients' readiness to quit…….....	1	2	3	4	5
d. Providing tobacco cessation assistance to patients who are thinking about quitting or are trying to quit using tobacco……	1	2	3	4	5
e. Arranging a follow-up counseling session with patients you assist with quitting……	1	2	3	4	5

3. How much confidence do you have in the following aspects of counseling patients to quit using tobacco?

PLEASE CIRCLE ONE NUMBER FOR EACH ITEM, USING THE RESPONSE OPTIONS SHOWN BELOW.

1 = not at all confident; 2 = not very confident; 3 = moderately confident; 4 = very confident; 5 = extremely confident

How confident are you that you—	Extremely confident				Not at all confident
a. Know the appropriate questions to ask patients when providing counseling ?...	1	2	3	4	5
b. Have the skills needed to counsel for an addiction?.....	1	2	3	4	5
c. Can provide motivation to patients who are trying to quit?.....	1	2	3	4	5
d. Have the skills to monitor and assist patients throughout their quit attempt?....	1	2	3	4	5
e. Have sufficient therapeutic knowledge of the pharmaceutical products for tobacco cessation?.....	1	2	3	4	5

f. Can create patient awareness of why nurses should ask questions about tobacco use and encourage quitting?……..….1 2 3 4 5

g. Can sensitively suggest tobacco cessation to patients who use tobacco?….. 1 2 3 4 5

h. Are able to provide adequate counseling when time is limited?..... 1 2 3 4 5

i. Can help recent quitters learn how to cope with situations or triggers that Might lead them to relapse back to smoking?..... 1 2 3 4 5

j. Can counsel patients who are not interested in quitting?..... 1 2 3 4 5

PLEASE CIRCLE THE BEST ANSWER FOR EACH QUESTION.

FB, a 43-year old female, requests your assistance with stopping smoking. Upon questioning, you gain the following information:

- Smoking 20 cigarettes per day for 25 years
- History of moderate but controlled hypertension and bulimia; not pregnant
- One previous failed quit attempt, cold turkey, one year ago
- Current medications: 25 mg atenolol (for blood pressure) once a day

4. Based on the above information, which of the following medications would NOT be appropriate for FB?

a. Bupropion
b. Nicotine nasal spray
c. Nicotine inhaler
d. Nicotine gum

5. If FB chooses to use the nicotine patch, which of the following patient education points would be incorrect to provide?

a. Do not smoke or use other types of tobacco while on the patch
b. Avoid wearing the patch while showering or bathing
c. Rotate patch sites daily
d. The patch will not provide the same rapid satisfaction as smoking

6. For patients who report sleep disturbances (vivid dreams, insomnia) while on a 24-hour patch, the MOST appropriate advice is to:

a. Discontinue patch use
b. Remove the 24-hour patch just before bedtime
c. Reduce the dose by cutting the patch in half
d. Take diphenhydramine (Benadryl) 25mg 30 minutes before bedtime

7. Most nicotine withdrawal symptoms tend to resolve between _____ after quitting?

a. 24 to 72 hours
b. 1 to 2 weeks
c. 2 to 4 weeks
d. 2 to 4 months

8. Which of the following statements is TRUE?

a. Pharmacotherapy increases long-term abstinence rates four-fold, compared to placebo
b. Most tobacco users make multiple quit attempts before they are able to quit for good
c. Smokeless tobacco is safe alternative to cigarettes
d. On average, individuals gain between 15 and 30 pounds after quitting

9. RP, a 25-year old female, quit smoking a week ago using the nicotine lozenge. During a follow-up counseling session, which of the following is LEAST APPROPRIATE to discuss with this patient?

a. RP's compliance with the nicotine lozenge regimen
b. Any side effects of the nicotine lozenge that RP is experiencing
c. How RP can avoid weight gain after quitting
d. How RP can cope with possible triggers for relapse

10. Which of the following is INCORRECT information to provide to patients who are about to begin therapy with bupropion?

a. Take one tablet daily for three days, then take on tablet twice daily
b. Quit smoking 7-14 days after initiating bupropion
c. If you experience difficulty sleeping, take both tablets (300mg) in the morning instead of 150mg twice daily
d. Bupropion can be used in combination with nicotine replacement therapy

11. Patients who are not yet considering quitting should be:

a. strongly advised to quit
b. provided with brief motivational interventions
c. persuaded to quit in the next 30 days
d. a and b are correct

12. With which of the following products does nicotine most rapidly reach the central nervous system?

a. nicotine lozenge
b. nicotine nasal spray
c. nicotine gum
d. nicotine inhaler

13. Which of the following is NOT associated with nicotine withdrawal?

a. Fatigue
b. Anger/irritability
c. Improved task performance
d. Anxiety

14. Do you think that the nursing medical profession should be more or less active in: CIRCLE ONE NUMBER IN EACH COLUMN.

●Helping patient to quit smoking?	● Helping to prevent patients from starting smoking?
1…More active	1…More active
2…No change is needed	2…No change is needed
3…Less active	3…Less active

15. Do you believe that nurses at this hospital would benefit from receiving the same, or similar, tobacco cessation training?

1…Yes
2…No

Thank you for helping me evaluate the Rx for Change tobacco cessation training program

Appendix E

Rx for Change: Clinician-Assisted tobacco Cessation
POST-TRAINING SURVEY

Note: Your responses are anonymous. However, I need the following information to "link" the forms that you complete for training.

Unique ID number (easy to remember):_____
Nursing Specialty: Medicine _____ **Surgery** _____

1. Please estimate the following: **VALUES SHOULD SUM TO 100**

a. Percentage of the program information that was **completely new to you** _____**%**

b. Percentage of the program information that you had been taught before but **needed to review** _____**%**

c. Percentage of the program that you had been taught before and was an **unnecessary review** _____**%**

TOTAL = 100%

2. What percentage of the program information do you expect to use when you work with patients? _____**%**

3. Do you think that participating in the class with increase: CIRCLE ON NUMBER FOR EACH COLUMN.

● The **number** of patients that you counsel to quit using tobacco?	● The **quality** of counseling that you provide?
1… Definitely yes	1… Definitely yes
2… Probably yes	2… Probably yes
3….Not sure	3….Not sure
4….Probably not	4….Probably not
5….Definitely not	5….Definitely not

4. **Before attending this class,** how would you have rated your overall ability to help patients quit using tobacco?

1	**2**	**3**	**4**	**5**
Poor	Fair	Good	Very Good	Excellent

5. **Now**, how do you rate your overall ability to help patients quit using tobacco?

1	**2**	**3**	**4**	**5**
Poor	Fair	Good	Very Good	Excellent

6. Please rate you level of skills for the following aspects of counseling: CIRCLE ONE NUMBER FOR EACH ITEM.

	Poor	Fair	Good	Very Good	Excellent
a. Asking patients whether they use tobacco……	1	2	3	4	5
b. Advising patients to quit using tobacco…….....	1	2	3	4	5
c. Assessing patients' readiness to quit…….....	1	2	3	4	5
d. Providing tobacco cessation assistance to patients who are thinking about quitting or are trying to quit using tobacco……	1	2	3	4	5
e. Arranging a follow-up counseling session with patients you assist with quitting……	1	2	3	4	5

3. How much confidence do you have in the following aspects of counseling patients to quit using tobacco?

PLEASE CIRCLE ONE NUMBER FOR EACH ITEM, USING THE RESPONSE OPTIONS SHOWN BELOW.

1 = not at all confident; 2 = not very confident; 3 = moderately confident; 4 = very confident; 5 = extremely confident

7. How confident are you that you—	Not at all confident				Extremely confident
g. Know the appropriate questions to ask patients when providing counseling ?...	1	2	3	4	5
h. Have the skills needed to counsel for an addiction?.....	1	2	3	4	5
i. Can provide motivation to patients who are trying to quit?.....	1	2	3	4	5
j. Have the skills to monitor and assist patients throughout their quit attempt?....	1	2	3	4	5
k. Have sufficient therapeutic knowledge of the pharmaceutical products for tobacco cessation?.....	1	2	3	4	5
l. Can create patient awareness of why physicians should ask questions about tobacco use and encourage quitting?……..….	1	2	3	4	5

g. Can sensitively suggest tobacco cessation to patients who use tobacco?….. 1 2 3 4 5

h. Are able to provide adequate counseling when time is limited?..... 1 2 3 4 5

i. Can help recent quitters learn how to cope with situations or triggers that Might lead them to relapse back to smoking?..... 1 2 3 4 5

j. Can counsel patients who are not interested in quitting?..... 1 2 3 4 5

8. Do you think that the nursing profession should be more or less active in:
CIRCLE ONE NUMBER IN EACH COLUMN.

●Helping patient to quit smoking?

1…More active
2…No change is needed
3…Less active

● Helping to prevent patients from starting smoking?

1…More active
2…No change is needed
3…Less active

9. Do you believe that nurses at this hospital would benefit from receiving the same, or similar, tobacco cessation training?

1…Yes
2…No

YOUR DEMOGRAPHICS

A. What is your sex? CIRCLE ONE NUMBER 1…Male 2…Female

B. What is your age? _____

C. Which of the following best describes you race or ethnicity? CIRCLE ONE NUMBER

1…Caucasian/White
2…African American
3…Hispanic or Latino
4…Asian or Pacific Islander
5…Native American
6…Other:_____

D. Have you smoked 100 or more cigarettes in your lifetime? CIRCLE ONE NUMBER

1…Yes
2…No

E. Which of the following best describes your tobacco use (cigarettes, cigars, pipes, snuff, or chew)? **CIRCLE ONE NUMBER.**

1…Use of tobacco once or more a day
2…Use tobacco less than once a day
3…Used to use tobacco but quit ► In what year did you quit? _____
4…Experimented with tobacco a few times in the past
5…Never tried tobacco

F. Did you complete a pre-training survey for this tobacco course? **CIRCLE ONE NUMBER.**

1…Yes
2…No

PLEASE CIRCLE THE BEST ANSWER FOR EACH QUESTION.

FB, a 43-year old female, requests your assistance with stopping smoking. Upon questioning, you gain the following information:

- Smoking 20 cigarettes per day for 25 years
- History of moderate but controlled hypertension and bulimia; not pregnant
- One previous failed quit attempt, cold turkey, one year ago
- Current medications: 25 mg atenolol (for blood pressure) once a day

1. Based on the above information, which of the following medications would NOT be appropriate for FB?

e. Bupropion
f. Nicotine nasal spray
g. Nicotine inhaler
h. Nicotine gum

2. If FB chooses to use the nicotine patch, which of the following patient education points would be incorrect to provide?

a. Do not smoke or use other types of tobacco while on the patch
b. Avoid wearing the patch while showering or bathing
c. Rotate patch sites daily
d. The patch will not provide the same rapid satisfaction as smoking

3. For patients who report sleep disturbances (vivid dreams, insomnia) while on a 24-hour patch, the MOST appropriate advice is to:

a. Discontinue patch use
b. Remove the 24-hour patch just before bedtime
c. Reduce the dose by cutting the patch in half
d. Take diphenhydramine (Benadryl) 25mg 30 minutes before bedtime

4. Most nicotine withdrawal symptoms tend to resolve between _____ after quitting?

a. 24 to 72 hours
b. 1 to 2 weeks
c. 2 to 4 weeks
d. 2 to 4 months

5. Which of the following statements is TRUE?

   a. Pharmacotherapy increases long-term abstinence rates four-fold, compared to placebo
   b. Most tobacco users make multiple quit attempts before they are able to quit for good
   c. Smokeless tobacco is a safe alternative to cigarettes
   d. On average, individuals gain between 15 and 30 pounds after quitting

6. RP, a 25-year old female, quit smoking a week ago using the nicotine lozenge. During a follow-up counseling session, which of the following is LEAST APPROPRIATE to discuss with this patient?

   a. RP's compliance with the nicotine lozenge regimen
   b. Any side effects of the nicotine lozenge that RP is experiencing
   c. How RP can avoid weight gain after quitting
   d. How RP can cope with possible triggers for relapse

7. Which of the following is INCORRECT information to provide to patients who are about to begin therapy with bupropion?

   a. Take one tablet daily for three days, then take on tablet twice daily
   b. Quit smoking 7-14 days after initiating bupropion
   c. If you experience difficulty sleeping, take both tablets (300mg) in the morning instead of 150mg twice daily
   d. Bupropion can be used in combination with nicotine replacement therapy

8. Patients who are not yet considering quitting should be:

   a. strongly advised to quit
   b. provided with brief motivational interventions
   c. persuaded to quit in the next 30 days
   d. a and b are correct

9. With which of the following products does nicotine most rapidly reach the central nervous system?

   a. nicotine lozenge
   b. nicotine nasal spray
   c. nicotine gum
   d. nicotine inhaler

10. Which of the following is NOT associated with nicotine withdrawal?

   a. Fatigue
   b. Anger/irritability
   c. Improved task performance
   d. Anxiety

Please add any **comments** (positive or negative) about the Rx for Change tobacco cessation training in the space below.

Thank you for helping me evaluate the Rx for Change tobacco cessation training program

Appendix F

Chart Audit Tool RX for Change

Staff Member:_____
Floor:_____
Date:_____

Pt ID	Smoking Status on Adm		Note charted if Smoking	
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No

Date:_____

Pt ID	Smoking Status on Adm		Note charted if Smoking	
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No

Date:_____

Pt ID	Smoking Status on Adm		Note charted if Smoking	
	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No

	Yes	No	Yes	No
	Yes	No	Yes	No
	Yes	No	Yes	No

Appendix G

Control Group

Dear Registered Nurse:

As a nurse at Barnes Jewish Hospital in St. Louis, you have frequent and prolonged contact with patients that are hospitalized. A portion of these patients may be current cigarette smokers. I would like to invite you to participate in a research study intended to investigate the current knowledge level of the dcRN about the effects of tobacco on the human body. As well, I would like to ascertain your current level of understanding about potential intervention strategies to promote smoking cessation. I am a doctorial candidate in Nursing at University of Missouri St. Louis, and this study represents my dissertation project.

Participation in this study will require filling out a questionnaire that contains 33 questions and should take approximately 25 minutes. A follow up questionnaire would be given to you in six weeks and would again take about 25 minutes. Following completion of the follow up questionnaire you will be given the opportunity to participate in a one day educational session.

All information obtained in connection with this study will remain confidential and will be used only for the purposes of the study. The surveys will be coded, and no individuals will be identified. No individual data will be revealed to the management of the hospital. Information gathered will be compiled and reviewed as a summary score, protecting individual identities.

You are under no obligation to participate in this study. Your completed survey will be taken as evidence of your willingness to participate, and you consent to have the information collected used for purposes of the study. You may withdraw from the study at any time. Should

you choose not to participate, your employment at Barnes Jewish Hospital will not be affected in any way.

Please keep this explanation about the study for your records. If you have any questions concerning this study, please feel free to contact me. You may call me at (314) 583-3415 or my graduate advisor, Dr. Roberta Lee at (314) 516- 6076.

Your response to this survey will be helpful in improving our understanding of the barriers to engaging in patient education about smoking cessation with a hospitalized patient. I greatly appreciate you taking the time out of you day to fill out and return the attached survey.

Sincerely,

Laura Bisch

Doctoral Candidate, College of Nursing

University of Missouri St. Louis

St. Louis, MO

Appendix H

Master List of Control Group Participants

Name	Floor	**Date**	Date	Date	Date	Date	Date	Date	Date	Date	Date

The data will be collected only to schedule post-test administration.

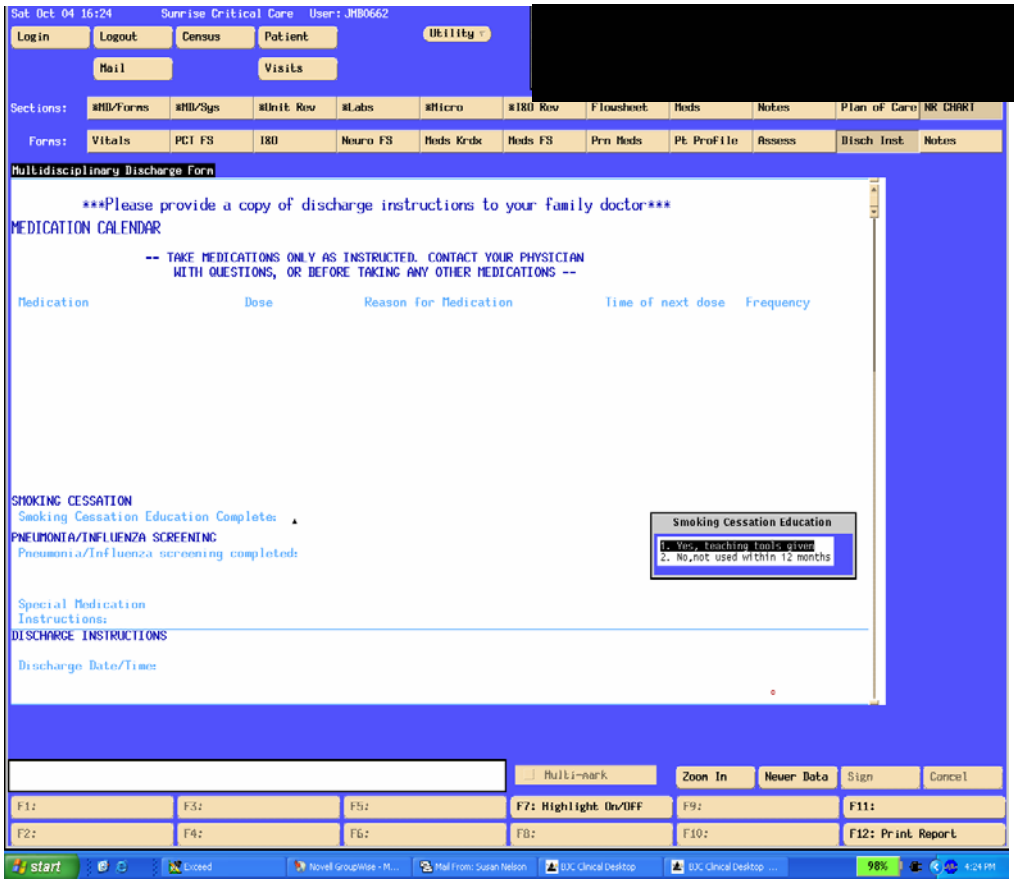
Appendix I

Two week Schedule

Date																			
Shift																			

Please enter the date you will work on the top line in consecutive order starting on the left and each following date in subsequent boxes. Below the date please indicate the start and end time of the shift you are working. This information is collected so follow up with participants can be done.

Appendix J


Sat Oct 04 16:24
Sunrise Critical Care
User: JMB0662
Login
Logout
Census
Patient
Utility
Mail
Visits
Sections:
Forms:
Vitals
PCI FS
IBD
Neuro FS
Meds Krdx
Meds FS
Prn Meds
Pt ProFile
Assess
Bisch Inst
Notes
Multidisciplinary Discharge Form
Please provide a copy of discharge instructions to your family doctor
MEDICATION CALENDAR
-- TAKE MEDICATIONS ONLY AS INSTRUCTED. CONTACT YOUR PHYSICIAN WITH QUESTIONS, OR BEFORE TAKING ANY OTHER MEDICATIONS --
Medication
Dose
Reason for Medication
Time of next dose
Frequency
SMOKING CESSATION
Smoking Cessation Education Complete:
PNEUMONIA/INFLUENZA SCREENING
Pneumonia/Influenza screening completed:
Special Medication Instructions:
DISCHARGE INSTRUCTIONS
Discharge Date/Time:
Smoking Cessation Education
1. Yes, teaching tools given
2. No,not used within 12 months
Multi-mark
Zoom In
Never Data
Sign
Cancel
F1:
F2:
F3:
F4:
F5:
F6:
F7: Highlight On/OFF
F8:
F9:
F10:
F11:
F12: Print Report
start
98%
4:24 PM