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**STUDY TO TEST NURSING SMOKING CESSATION INTERVENTIONS ON
THE STAGE OF BEHAVIOR CHANGE OF SMOKERS**

By

Barbara J Goudie

A THESIS

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ABSTRACT

STUDY TO TEST NURSING SMOKING CESSATION INTERVENTIONS ON THE STAGE OF BEHAVIOR CHANGE OF SMOKERS

By

Barbara J Goudie

The purpose of the study was to test the effect of smoking cessation interventions given by nurses on the stage of behavior change of smokers. Prochaska & Velicer's (1997) transtheoretical model of behavior change was used to provide direction for the study. The sample was a convenience sample of ten. The subjects were patients on the medical/surgical floors of a general hospital who met the selection criteria. Demographic information and smoking history were obtained from the patients, and an intervention based on a protocol developed from Prochaska's health promotion model was given to each subject. One month after the intervention a phone call was made to assess the stage of behavior change. Six patients responded to the phone call. Descriptive statistics were used to determine if patients had moved to the next stage. The results showed that one patient had moved to the next stage of behavior change.

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Chapter I

INTRODUCTION

Cigarette smoking is an enormous health problem in the United States. In 1997 p18 the Agency for Health Care Policy and Research (AHCPR) published Smoking Cessation Clinical Practice Guidelines. These guidelines provided recommendations for three groups of professionals, primary care clinicians, smoking cessation specialists, and health care administrators. The impetus for these guidelines was based on three facts. First, smoking is a significant health threat; second, clinicians do not intervene on a consistent basis, and last, cessation treatments are now readily available. The authors of the guidelines state that it is difficult to identify other health related conditions in the United States that are so lethal and neglected but have effective interventions that are readily available.

The Joint Committee of Smoking and Health consisting of the American College of Chest Physicians, American Thoracic Society, Asia Pacific Society of Respiriology, Canadian Thoracic Society, European Respiratory Society, and the International Union against Tuberculosis and Lung Disease, issued a statement to physicians outlining the health issues related to tobacco use. Countries that report smoking related deaths representing one third of the world population, reported 21 million deaths in the age group 35-69 years in the decade 1991 to 1999. About a third of this age group will die from smoking related diseases in developed countries. This makes smoking the single

largest cause of premature death. Smoking accounts for 87% of all deaths from lung cancer, 82% of deaths from chronic obstructive pulmonary disease, 21% of deaths from coronary heart disease, and 18% of deaths from stroke. Exposure to tobacco smoke in the non-smoker increases the risk of lung cancer by 30%. Children and infants exposed to tobacco smoke have an increased risk of respiratory problems, malignancy, and other health problems. Nicotine in tobacco is highly addictive, a greater number of casual users progress to addictive patterns of use than in other addictive substances such as cocaine, morphine and alcohol.

Problem Statement. Nurses currently provide care for many of the 390,000 Americans who die from smoking related diseases. Tobacco use in patients receiving nursing care makes their nursing care needs unique. Smoking increases the risk of complications following surgery, and may interact with certain drugs. Nicotine withdrawal following hospitalization can add to discomfort and anxiety. Chronic smoking may also delay a patient from seeking health care for fear of being pressured to stop smoking. Nurses are in an ideal position to implement smoking cessation and smoking prevention programs. Nurses have contact with the smoking population through schools, the workplace, and hospitals. Barriers to providing nursing interventions for smoking are lack of knowledge, lack of accountability, and the value put on personal autonomy by nurses (Rienzo 1993).

In 1997 Miller, Smith, DeBush, Sobel and Taylor conducted a randomized control trial to compare the effectiveness of two smoking cessation programs. They found that nurse mediated counseling followed by post discharge phone calls was effective in increasing post discharge cessation rates. In 1998 Gebauer, Chung-Ying Kwo, Haynes

and Wewers, Ahijevych & Sarma (1998) evaluated the effectiveness of nurse managed smoking cessation interventions in an outpatient setting among pregnant women who smoked. The authors concluded that a nurse managed smoking cessation program was effective in promoting smoking cessation in pregnant women. This is beginning evidence that nursing interventions can have a positive influence on smoking behaviors.

Purpose of the study.

The purpose of the study is to test the effect of smoking cessation interventions given by nurses on the stage of behavior change of smokers. Use of Prochaska & Velicer's (1997) transtheoretical model of behavior change will provide direction for the intervention to meet the needs of the client and increase smoking cessation rates.

Chapter 2

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Theoretical Framework.

The transtheoretical model of behavior change provides a basis for studies that incorporate health promotion. In 1997 Prochaska and Velicer described the model and its relation to health promotion programs. The model was developed from an analysis of leading theories of psychotherapy and behavior change. Ten processes of change were identified. Empirical analysis of self-changers compared to smokers having professional treatments was used to assess how frequently each group used each of the ten processes. The result of this research showed that behavior change progresses through a series of behavior stages.

Core Constructs of the Transtheoretical Model of Behavior Change.

Decisional Balance. Decisional balance is the decision making process in which the individual considers the advantages and disadvantages of changing. The decision-making processes are presented below:

1. Temptation is the urge to engage in an unhealthy behavior in a difficult situation. The three most tempting factors have been found to be emotional distress, social situations and craving.
2. Self-efficacy was adapted from Bandura's self-efficacy theory as cited by Prochaska & Velicer (1997). It is the confidence to enter high-risk situations without relapsing into the unhealthy habit.

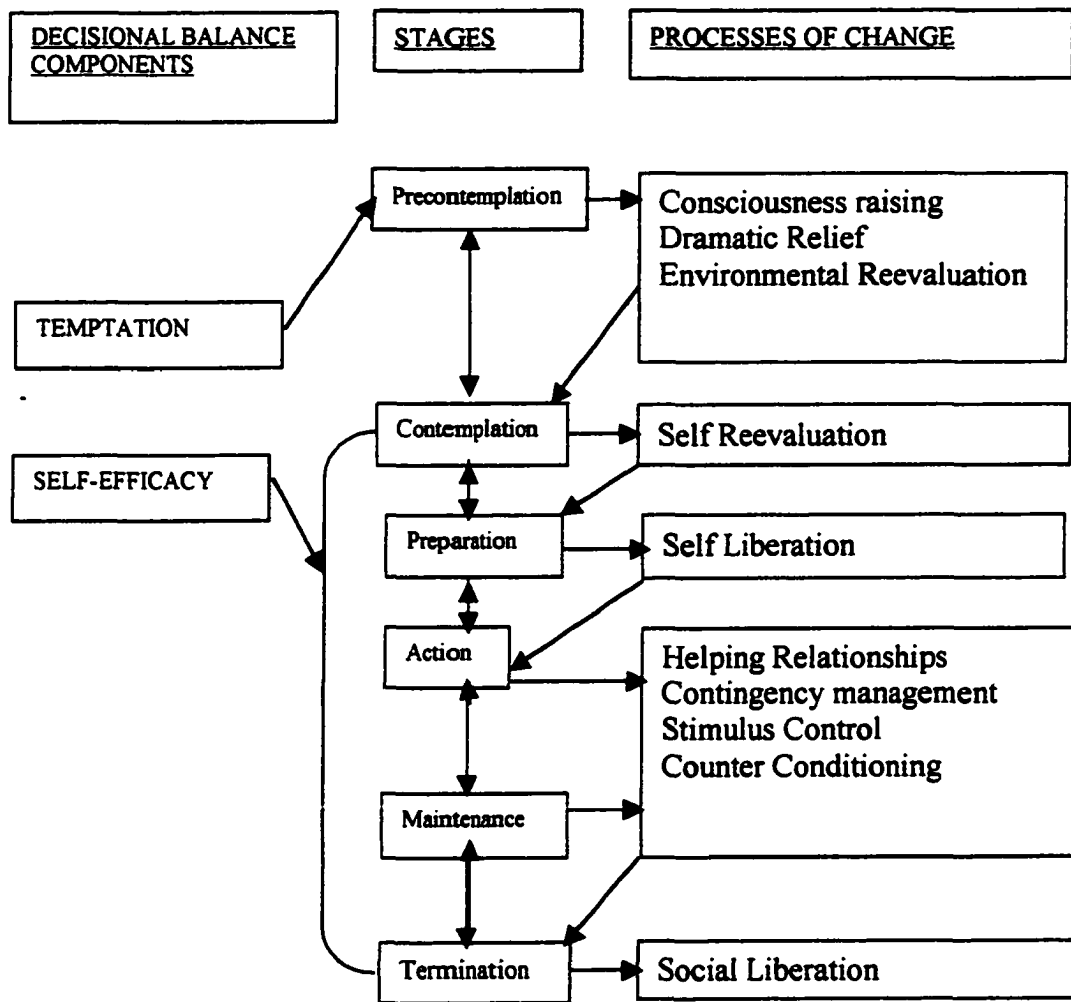


Figure 1: Prochaska's Transtheoretical Model of Behavior Change.

Stages of behavior change. In the past, behavior change has been assumed to be a single event, for example stopping smoking. The transtheoretical model is constructed from six stages that imply that change is a process that occurs over time. The six stages follow:

1. Precontemplation is the stage in which people are not intending to take action in the foreseeable future. This is usually measured in the next six months. These people are characterized as resistant.

2. Contemplation is the stage in which people are intending to change in the next six months. People can stay in this stage a long time, caught by the ambivalence of changing.

3. Preparation is the stage in which people intend to take action in the immediate future. They have a plan of action, for example joining a health class.

4. Action is the stage in which people have made modifications to their lifestyle in the past 6 months. Only modifications to behavior that significantly reduce the risk of disease count as action. For example in smoking, only total abstinence counts. In the transtheoretical model action is only one of six changes.

5. Maintenance is the stage in which people are working to prevent relapse but are maintaining new health habits. Research has shown that these people may stay in this stage for between six months and three years.

6. Termination is the final stage in which individuals are sure they will not return to the old habit.

Processes of change. The processes of change are the activities that people use as they progress through the changes. They provide a guide for intervention programs.

Support has been found for the ten processes by observing behaviors such as cigarette use, diet, cocaine use, exercise and condom use. The ten processes of change are presented below:

1. **Consciousness raising is an increased awareness of causes and consequences.**
2. **Dramatic relief is the use of dramatic messages, for example media campaigns or personal testimonies that move people emotionally. Dramatic relief can make people more susceptible to health promotion messages.**
3. **Environmental reevaluation is assessment of how a habit affects social environment.**
4. **Self-reevaluation is assessment of self-image with and without the unhealthy habit.**
5. **Self-liberation is belief that change is possible, and commitment and recommitment to act on that belief. A number of choices can enhance self-liberation. For example smokers can be given three good action choices, stopping smoking without nicotine replacement, nicotine fading and nicotine replacement.**
6. **Contingency management provides consequences for a particular behavior. Punishment can be used, but self-changers rely on rewards much more than punishments. A philosophy of the stage model is to work in harmony with people so procedures that can be used are overt or covert reinforcements or positive self-statements.**
7. **Helping relationships are trust, openness, acceptance and support for the behavior change.**
8. **Counter conditioning is learning healthier behaviors that can be**

substituted for problem behaviors.

9. Stimulus control is the removal of cues for unhealthy behaviors and addition of prompts for healthy behaviors.

10. Social liberation is an increase in social opportunities or alternatives. Motivation research indicates a greater number of choices can enhance will power. An example of this is smoke-free zones or salad bars in school lunches.

Assumptions. In describing the transtheoretical model of behavior change Prochaska and Velicer (1997) outlined some assumptions that drive the model. These assumptions are:

1. No single theory can account for the complexities of behavior change, therefore an integration across theories will result in a more comprehensive model.
2. Behavior change progresses through time in a number of stages.
3. Stages are both stable and open to change.
4. Populations will remain stuck in the early stages without planned interventions.
5. Interventions must be matched to an individual's stage of change.
6. Most at risk populations will not be served by traditional action oriented programs. Health promotion is more effective if it moves from an action paradigm to a stage paradigm. One of the failures of behavior change intervention is the poor retention rate. A meta-analysis of 125 studies showed a dropout rate of 50%. Higher retention rates are found when interventions are matched to the stage of change.
7. Chronic behavior patterns are usually a combination of biological, social, and self-control. Interventions that are designed to match the stage of change will

enhance self-controls.

Review of Literature

Transtheoretical Model of Behavior Change

In 1991 DeClemente, et al. tested the transtheoretical model of behavior change, by recruiting a large number of smokers to take part in a study on minimal interventions in smoking cessation. The stage of change the subjects were in was determined by the use of questionnaires. The stages of change were compared using smoking history, the ten processes of change, pretest self-efficacy and decisional balance. Subjects were randomly assigned to one of four interventions stratified by stage of change. The four interventions were: (a) American Cancer Society materials and manuals; (b) transtheoretical manuals; (c) transtheoretical manuals and individualized written feedback based on pretest, posttest, and 6 month questionnaires, and (d) transtheoretical manuals and individualized written feedback plus a series of counselor calls at pretest, posttest, 3 months and 6 months. The study did not have a control group. The measures used were (a) the Smoking Abstinence Self-Efficacy measure, (b) the Perceived Stress Scale, (c) the Smoking Decisional Balance Scale, and (d) the Smoking Process of Change scale. Smoking cessation was determined at one and six months. The authors state that the results showed a correlation between the stage the subject was in at the beginning of the study and attempts to stop smoking and smoking cessation at one and six months, the authors did not put the level of significance in the article. This study can be criticized because the cessation rates were self-reported. Subjects recruited for the study may not have been in a precontemplation stage that was resistant to any sort of smoking cessation message. The authors state that the results of the study support the model and support a preparation

authors state that the results of the study support the model and support a preparation stage between the contemplation and action stages.

Prochaska & Velicer's transtheoretical model (1997) provides a framework for successful health promotion programs. Large studies have been carried out to assess the effectiveness of health promotion programs. In Minnesota \$40 million was spent over 5 years in four communities, targeting 400,000 people, to promote smoking cessation, healthy diet, weight control, and blood pressure control. The results showed that the treatment group who attended health promotion programs showed no significant improvement in healthy behaviors compared to the control group. The reason for this result may be that only between 1% and 5% of members of the at risk groups participated in the health promotion studies. A meta analysis of studies using stage-matched health-promotion programs, has shown that once at risk populations have been recruited, matching the intervention to the stage of change results in high retention rates. This is because use of stage-matched health promotion programs allows the programs to meet the patient's needs (Prochaska & Velicer, 1997).

This study tests interventions given by nurses to patients who smoke cigarettes. The protocol used was developed from Prochaska's transtheoretical model of behavior change because matching the intervention to the stage of change has been shown to result in greater outcomes of healthy behaviors.

Smoking Cessation.

In 1990 Clark, Haverty and Kendall studied the nurse's role in smoking cessation intervention. Sixteen nurses from various clinical backgrounds took part in a two-day training session to enhance their skills in providing smoking cessation interventions. Each

cessation interventions. The authors do not state whether power analysis was used to determine the sample size. The interventions were taped and data on the clients smoking history, health history, and motivation were collected. One year later 17% of the clients had been found to have stopped smoking. A further 12% had reduced the number of cigarettes smoked. Spearman's Correlation Coefficient was used to determine the relationship between level of motivation to stop smoking, and concern about the health consequences of smoking, a highly significant ($p \leq 0.01$) relationship was found. A significant ($p \leq 0.03$) relationship was also found between confidence in ability to give up smoking and successfully giving up. The authors do not say if a significant number of smokers stopped smoking. The results of the study found that the knowledge provided by the nurses increased the client's motivation to quit by promoting smoking cessation. The limitations of the study include a small sample size, convenience sample, and lack of control group. The study indicated that the nurse client relationship provides an opportunity to provide effective smoking cessation interventions.

In 1990 Taylor, Houston-Miller, Killen and DeBusk studied the effect of a nurse-managed smoking cessation intervention on patients who suffered a myocardial infarction. The nurse-managed intervention incorporated principles of social-learning theory combined with addiction models for nicotine. Patients in the usual care group ($n = 86$) were not given any instructions on how to stop smoking. Two nurses experienced in coronary care carried out a nurse-managed intervention in the experimental group ($n = 87$). The authors do not state whether power analysis was used to determine the sample size. The intervention consisted of a review of the benefits of not smoking and the dangers of returning to smoking after infarction. Patients were then given a manual called

“Staying Free” that reviewed the benefits of smoking cessation and was designed to be filled in over two weeks. Patients filled in the first half of “Staying Free” during the first week in the hospital. They were also given two audiotapes for home use that reviewed the contents of the manual. The nurses contacted the patients by phone once a week for the first two or three weeks then monthly for four months. Follow up was done at 26 and 52 weeks after infarction. Expired carbon monoxide and sodium thiocyanate levels were used to determine smoking status. Phone contact was made if the patient failed to return to 3 follow up appointments, and report of a significant other was used to corroborate smoking status. The results showed a significant increase in smoking cessation in the experimental group. One hundred and twenty-three patients had biochemical verification of smoking status at 12 months, and seven patients had verification by a significant other at 12 months. The authors classified sustained nonsmokers as those subjects who were biochemically shown to have quit smoking at 6 and 12 months. Unsustained nonsmokers were those subjects who were biochemically shown to have quit at 6 or 12 months. Using these criteria 65% of the intervention group were sustained nonsmokers compared to 35% of subjects in the usual care group $\chi^2(4, n = 120), = 5.1, p < 0.024$. The authors concluded from this study that because the intervention was done as a package, further studies should be done to determine which part of the intervention was most successful. The authors found that although extra time was given to patients who expressed little intention of quitting, these patients did not quit smoking. Therefore further studies are needed to determine methods to address the needs of this group. These findings also support matched smoking cessation intervention to the stage of change.

In 1992 O'Connor, et al. studied the effectiveness of a pregnancy smoking

cessation program. The number of study subjects was 224. It is not apparent whether power analysis was used to determine the sample size. Two nursing methods of delivery of a smoking cessation self-help program at the initial prenatal visit were compared. A research nurse provided the usual care control intervention. This intervention consisted of a 3 to 5 minute explanation of the dangers of smoking, and each patient received an invitation to a two-hour group smoking cessation class. In addition to the usual care intervention, the experimental group was offered an individual intervention which lasted 20-minutes. A public health nurse carried out the experimental intervention. A follow up phone call was also offered at a mutually agreed time. The experimental and usual-care groups were assigned on alternate days. Smoking behavior was measured at one month, 36 weeks gestation, and 6 weeks postpartum using self-report and urinary cotinine levels. Analysis of covariance, controlled for the baseline level of smoking, was used to examine the number of cigarettes smoked by the experimental group over the follow-up periods. The Chi-square test was used to analyze the difference in cessation rates between the control group and the experimental group. The effect of the program was found to be statistically significant, with women in the experimental group smoking approximately two fewer cigarettes a day than the control group. The experimental group had significantly $\chi^2(1, n = 115) = 5.549, p < .05$, higher cessation rates than the usual care group, at one-month gestation and the six weeks postpartum follow up $\chi^2(1, n = 115) = 4.116, p < .04$. A significant difference could not be detected at 36 weeks $\chi^2(1, n = 115) = 2.685, p < .01$, this was due to missing data from preterm deliveries. The authors concluded that although the results of the study were encouraging, large numbers of pregnant patients were not quitting. One quarter of the experimental group were found

to have low motivation to quit. The results of the study showed that going to the smoking intervention class was not a viable alternative. Many of the patients stated that it was too difficult to attend extra classes as well as the prenatal clinic. The authors also concluded that smoking cessation interventions are premature until patients are ready to change their behavior. Follow up studies are needed to examine the efficacy and cost effectiveness of smoking cessation interventions based on motivation to quit.

In 1993 Stanislaw and Wewers conducted a pilot study to assess the effect of smoking cessation interventions during hospitalization on short-term smoking abstinence. The subjects were surgical oncology patients. The design was a randomized experimental design. The authors do not state if power analysis was used to determine the sample size. The experimental group ($n = 12$) received a structured smoking cessation intervention that consisted of three, twenty-minute sessions daily, starting on postoperative day two. A clinical nurse specialist trained in smoking cessation carried out the interventions. Following discharge the experimental group received weekly phone calls for five weeks to encourage maintenance. The control group ($n=14$) received the usual care provided by nurses on a surgical oncology unit. The amount of smoking cessation information varied and was dependent on the individual care provider. Follow up was by self-report and saliva cotinine level five weeks following discharge from hospital. The t test and chi-square tests were used to compare the results of the control and experimental groups. The authors state that the difference in abstinence rates by group approached statistical significance $\chi^2(1, n = 12) = 2.735, p < 0.10$. The authors conclude that more efforts to design, deliver and evaluate smoking cessation interventions by nurses are needed.

In 1994 Hill, Rice, Lepeczy, Sieggreen, Mullin, Jarosz and Templin examined the

effectiveness of three methods of presenting smoking cessation interventions in non-hospitalized cardiovascular patients. Clinical nurse specialists carried out the interventions. The convenience sample of 255 subjects were assigned to one of four groups. For ethical reasons all the participants in the study were told by a clinical nurse specialist that they must quit smoking for health reasons. Two of the groups were given smoking cessation interventions. The first group of subjects were given the intervention either as a group or individually. The intervention consisted of a written work guide and materials, and attendance at a one-hour intervention workshop daily for four days and an additional hour a week later. The third group were given the written materials but did not attend the workshop. The fourth group were not given any smoking cessation interventions. Chi-square analysis of the subjects who choose to, and did not chose to participate in the study showed significant differences by intervention group assignment $\chi^2 (3, N= 394) 8.15 =, p = < .05$. The lowest refusal rate was in the subjects assigned to the group that received written information (28%). The highest refusal rate was in subjects assigned to the no intervention group (48%). Subjects were followed up at one month and one year using self-report and saliva thiocyanide testing. Chi-square and odds ratios were used to compare the quit rates at one month and one year. Assuming that all the subjects who did not report at one month and one year were smoking, for both time periods the results showed that quit rates were higher in the individual intervention, group intervention, and the no intervention group compared to the written intervention group $\chi^2 (3, N= 193) = 11.90, p = < 0.01$. However a significantly higher number of subjects in the no intervention group had quit smoking at one year. The authors attribute this result to a variety of factors. Previous studies have shown that subjects who serve as controls in

smoking cessation studies have devised their own methods to quit smoking, and people who devise their own methods to quit are twice as likely to quit. The authors did not assess the stage of change of the subjects. Assessment of the stage of change may have shown that subjects were in the contemplation stage as described by Prochaska and Velicer (1997). Limitations of the study include use of convenience sampling, lack of racial diversity, lack of sensitivity and specificity in the saliva sodium thiocyanate testing. The authors conclude that the study supports smoking cessation interventions by nurses; further studies are needed to provide direction for nurse counseling.

In 1997 Houston Miller, Smith, DeBusk, Sobel and Barr Taylor studied the effectiveness of two smoking cessation interventions in hospitalized patients. Patients in four community hospitals were randomly assigned to one of three groups. The groups were: (a) usual care (b) a nurse-mediated intervention with one discharge phone call; (c) the same intervention with four discharge phone calls. The nurse mediated intervention consisted of a 30-minute counseling session, incorporating principles of social learning therapy and relapse prevention therapy. The study was planned in two phases. In the first phase 330 patients were randomly assigned to receive an intensive nurse managed intervention, and 330 patients received usual care. At one year the quit rate was 31% for the patients receiving the nurse managed intervention, compared to 21% in the patients receiving usual care. In the second phase an additional 230 patients received the intensive intervention, 600 patients received usual care and 473 patients received the minimal intervention. Odds ratios and confidence intervals were used to calculate the outcomes between the groups. The results of the study showed that a year later a significant number ($p = 0.009$, OR = 1.4, 95%, CI = 1.1 – 1.8) of patients from the intervention group, that

included four phone calls, had stopped smoking. The authors concluded from this study that nurse-mediated smoking cessation interventions are an effective way to promote smoking cessation in hospitalized patients.

In 1998 Dijkstra, De Vries, Roijackers and Van Breukelen studied smokers in various stages of readiness to quit to determine the smoking cessation intervention most appropriate for each stage of change. The subjects were asked to indicate when they planned to stop smoking to determine the stage of change they were in. Smokers were randomly assigned to one of four groups. The first group ($n = 384$) received information on the outcomes of quitting. The second group ($n = 385$) received only self-efficacy enhancing information. The third group ($n = 386$) received both types of information. The final group ($n = 385$) received no information. Smoking cessation was determined 10 weeks later by self-report. Logistic regression was the statistical test used to determine stage transition, and linear regression was used to determine intention to quit. The results showed a significant ($p < .05$) increase in stage transition in the experimental group compared to the subjects who received no information. This was not true for the first group of subjects who only received information on the outcomes of quitting. The results also showed that subjects in the contemplation stage, preparing to change in the next months, benefited the most from both types of information. Subjects in the preparation stage benefited from the self-efficacy enhancing information only. The study was limited by the short follow-up time. The authors conclude that a large number of smokers are not ready to quit smoking therefore further studies should be done addressing the group of smokers with a low readiness to quit.

In 1999 Johnson, Butz, Mackay and Miller used a quasi-experimental design to

study the effects of smoking cessation interventions delivered by nurses on hospitalized smokers. The subjects recruited for this study were in the contemplation stage of smoking cessation. The sample size was one hundred and two. The authors do not report if power analysis was done to determine sample size. Fifty-two of these subjects were assigned to the control group these subjects were given the usual care. The experimental group were given a smoking cessation intervention based on five principles: (a) smoking cessation is a process; (b) individuals choose to stop smoking; (c) interventions should be stage-matched; (d) self-efficacy is important, and (e) interventions should be reinforced with long term follow up. The subjects were all contacted at six months following discharge. Of the initial 102 enrolled 11 were lost to follow-up, and 6 had died. Chi-square was used to compare the intervention group with the control group. When the subjects lost to follow up were coded as smokers the number of subjects who had stopped smoking was not significantly different $\chi^2(1, n = 102) = 2.94, p < 0.23$. The limitations of the study were that the smoking cessation rates were self-reported and that there was a 16% attrition rate. The authors state that although the number of subjects who quit was not statistically significant, the findings of a cessation rate of 46% in the treatment group compared to 31% in the control group indicate that more studies are needed to investigate the effectiveness of nurse-managed smoking cessation interventions.

In 1999 Rice completed a meta-analysis to determine the effects of nurse delivered smoking cessation interventions. Fifteen studies that compared a nursing intervention with usual care were reviewed. The review did not include interventions for pregnant smokers. The results showed that interventions were most effective in hospitalized patients with cardiac disease. The least effective intervention was screening

patients at a health check. No evidence was found that high intensity interventions were more effective than lower intensity interventions. The author concluded from the review that there are benefits for patients from smoking-cessation interventions, given by nurses to patients. The author identified that the challenge for nurses will be to incorporate smoking cessation interventions into standard nursing practice. The author also identified the need for further studies with consideration given to sample size participant selection, refusals, dropouts, long term follow up and biochemical verification.

Implications for the study. Integrating effective smoking cessation interventions into all health care settings should be a priority for all health care professionals (AHCPR, 1996). The number of nurses who counsel patients is low, although most nurses believe it is their responsibility. The barriers to assessment and smoking cessation treatment include: (a) lack of knowledge on how to identify smokers quickly and easily; (b) lack of knowledge of which are the most effective treatments; (c) lack of knowledge of how to deliver treatments; (d) lack of knowledge of the efficacies of different treatments (Wewers, 1996). To overcome these barriers it is important to conduct research studies that test low intensity, stage-matched smoking cessation interventions that nurses can use in daily practice.

Research question. Do stage matched interventions move patients to the next stage of behavior change one-month post intervention?

Chapter 3

METHODS

Design

A quasi-experimental prospective design was used to answer the question do stage-matched interventions move patients to the next stage of behavior change at one-month post intervention. A convenience sample of ten subjects were initially tested for stage of change. The subjects were then given a stage-matched smoking cessation intervention. The subjects were tested one month after the intervention to see if they had moved to the next stage of behavior change.

Population and Sample.

Patients admitted to a general hospital were recruited to participate. Subject criteria for entrance to the study were: (a) age greater than 18 years; (b) smoke cigarettes; (c) able to speak English; (d) physiologically stable; (e) no overt signs of mental confusion; (f) willingness to participate with informed written consent, (g) access to a phone for the follow-up phone call; and (h) no diagnosis of mental disease or depression. Patients were determined to be physiologically stable if they had stable vital signs and were not in immediate danger from a life threatening disease. Patients were determined to show no signs of mental confusion if they were oriented to time, place, and person. The sample was a convenience sample, selected from patients who met the selection criteria. The sample size was ten.

Procedures.

1. The principal investigator reviewed patient profiles on the medical

surgical units 6N, 2S, 7N, and 4W at Spectrum Health, Grand Rapids MI, to determine potential subjects.

2. Patients who were currently hospitalized and met the selection criteria were invited to participate in the study by the principal investigator.

3. The study was explained using the verbal script (see Appendix A for verbal script).

4. Subjects were asked to take part in a study evaluating the effectiveness of smoking cessation interventions to change smoking behavior. After agreeing to participate they were asked to sign an informed consent (see Appendix B for consent form). The signed consent forms were kept in a locked file drawer separate from data collection tools. All the patients who agreed to participate in the study were asked the following demographic information: (a) age; (b) gender; (c) marital status; (d) ethnicity; (e) income; (f) level of education; (h) reason for hospitalization; (i) family members who smoke; (j) number of years subject has smoked; (k) age subject started smoking, and (l) number of quit attempts (see Appendix C for demographic data collection form).

5. Information was sought regarding stages of behavior change, followed by stage appropriate nursing interventions for smoking cessation (see Appendix E for revised intervention protocol for study).

Intervention. The intervention consisted of a smoking cessation protocol developed by Pratt (2000) to identify the stage of change described in the core constructs of Prochaska & Velicer's transtheoretical model of behavior change (1997) and provision of appropriate support. Information from Pratt's (2000) protocol was reformatted for use in the study (see Appendix D for revised intervention protocol for study). The

intervention took ten minutes. Subjects were asked if they intended to stop smoking in the next six months. If the answer was no subjects were in the precontemplation stage. If the answer was yes subjects were asked if they intended to stop smoking in the next month. If the answer was no patients were in the contemplation stage. If the answer was yes patients were asked if they had a plan to stop smoking if the answer was no patients were in the contemplation stage. If the answer was yes patients were in the preparation stage. Subjects in the precontemplation and contemplation stage were given a short explanation about the relationship of cigarette smoking to the disease process with regard to arteriosclerosis, increased blood pressure, and readmission to hospital for the same thing. The subjects were then given stage-appropriate literature. Subjects in the preparation stage were given stage-appropriate literature and an appointment to a smoking cessation class.

Data Collection

A follow-up phone call was made at one-month. Only six of the study subjects were reached by phone although multiple attempts were made to reach the study subjects. Information about the stage of change of the subject was obtained using the follow-up phone call data collection tool (see Appendix D for data collection tool for follow up phone calls). Subjects were re-evaluated for their current stage of behavior change using the same protocol as for the initial data collection.

Chapter 4

RESULTS

Introduction.

Descriptive statistics were used to analyze the data. A typical subject was a white male with some high school education, and had siblings who smoked (see Table 1). The mean age, years of smoking, age started smoking, and number of quit attempts were calculated using the Statistical Package for the Social Sciences (see Table 2). The same statistical package was used to calculate the percentage of subjects in each stage of change before the initial intervention (see Table 3), and one-month following the intervention (see Table 4). The percentage of subjects according to gender, race, level of education, diagnosis, and family members who smoke were calculated. Of the ten subjects recruited only six subjects were reached after multiple attempts for a follow-up phone call.

Demographic Information.

The mean age of the study subjects was 32.9 ($SD = 11.3377$) range is 18-50. Six of the study group (60%) consisted of men, and four were women (40%). Seven of the participants (70%) were white, and three black (30%). Five of the subjects were married (50%), and five (50%) were single. Four of the subjects (40%) had some high school education. Six of the subjects (60%) were high school graduates. Two of the subjects (20%) had some college education. One of the subjects (10%) had a bachelors degree. One of the subjects (10%) had a diagnosis of lung disease. One of the subjects had been admitted to the hospital for surgery. Eight of the participants (80%) had a diagnosis other

than lung disease, heart disease and diabetes. None of the female subjects ($n = 4$) had a spouse who smoked. Two of the male subjects ($n = 6$) (20%) had a spouse who smoked. Three of the subjects (30%) had a mother who smoked, and two (20%) had a father who smoked. One of the subjects (10%) had other family members who smoked (see Table 1).

Table 1

Demographic Characteristics of Study Participants.

Characteristic	Variable	Number ($n = 10$)
Gender	Male	6
	Female	4
Marital status	Single	5
	Married	5
Race	White	7
	Black	3
Level of education	Some high school	4
	High school graduate	2
	Some college	2
	Associate degree	1
	Bachelors degree	1
Diagnosis	Lung disease	1
	Surgery	1
	Other	8
Relatives who smoke	Husband	1
	Wife	2
	Mother	3
	Father	2
	Siblings	7
	Other	1

The mean number of years that subjects smoked was 15.2 ($SD = 10.4860$) range is 3-30. The mean age at which smokers started smoking was 17.7 years ($SD = 5.2026$) range is 12-31. The mean number of times the subjects had tried to quit was 3.9 ($SD = 3.7253$) range is 0-10 (see Table 2).

Table 2

Descriptive Statistics for Key Study Variables.

Variable	M	SD	Range	N
Age of subject	32.9	11.3377	18-50	10
Years smoking	15.2	10.48860	3-30	10
Age started	17.7	5.2925	12-31	10
Number quit attempts	3.9	3.723533	0-10	10

Initial Stage of Change.

Four of the study participants (40%) stated that they were not ready to stop smoking; therefore they were in the precontemplation stage. Four of the study participants (40%) stated that they intended to stop smoking in the next six months; therefore they were in the contemplation stage. Two of the study participants (20%) stated that they had a plan to stop smoking; therefore they were in the preparation stage (see Table 3).

Table 3

Initial Stage of Change

Stage of change	Initial interview (n = 10)
Precontemplation	4
Contemplation	4
Preparation	2

Results at Follow-up Phone Call.

One of the subjects (10%) who responded to the follow up phone call (the sixth subject) had moved to the next stage, this subject was in the preparation stage. Three of the subjects who responded to the follow up phone call (30%), were in the precontemplation stage and had not moved to the next stage. One of the subjects (10%) who responded to the follow up phone call was in the contemplation stage and remained in the contemplation stage. One of the subjects was in the preparation stage at the first interview, and had progressed to the precontemplation stage at the follow-up phone call (see Table 4).

Table 4

Stage of Change at Initial Interview and Follow up Phone Call

Subject	Initial stage of change	Stage of change at one month
1	Precontemplation	Precontemplation
2	Precontemplation	Precontemplation
3	Precontemplation	Precontemplation
4	Contemplation	Contemplation
5	Preparation	Precontemplation
6	Preparation	Action

Chapter 5

DISCUSSION OF FINDINGS

The study answered the question, 'do stage-matched interventions move patients to the next stage of behavior change one-month post intervention?' Four of the study subjects were in precontemplation and remained in the same stage of behavior change, one of the subjects moved from preparation to action, and one of the subjects moved from preparation to precontemplation.

The study subjects who remained in precontemplation may have needed low intensity repeated interventions to move to the next stage. In 1991 DeClemente, et al. tested the transtheoretical model of behavior change, by recruiting a large number of smokers to take part in a study on minimal smoking cessation interventions. The study showed that it is possible for subjects in all the stages to move to action in a six-month period. The authors found that intensity, duration, and type of intervention had an affect on movement through the stages of change. Subjects in the preparation stage were closest to action, and often successfully quit smoking following intense short action interventions. Subjects in the precontemplation stage benefited from less intense repeated contacts to follow them through the stages of change.

Although the subjects categorized in this study as precontemplators were given an intervention based on stage of change, they did not receive follow-up repeated interventions that may be needed to move precontemplators through the stages of change. Prochaska and Velicer (1997) discussed the assumptions of the transtheoretical model of behavior change. One of the assumptions is that stages of change and behavior change

are both stable and open to change. This may be the reason that one of the subjects moved from preparation to precontemplation.

Limitations.

This study had several limitations. The study was limited by small sample size and poor response rate although multiple attempts were made to contact subjects. The low sample size was due to the difficulty of recruiting subjects who did not have a diagnosis of mental disease or depression. The number of patients initially recruited was ten, and the number of patients who responded to the follow up phone call was six. The follow up phone call was only at one-month post intervention. The data obtained to measure stage of change were nominal level data.

Implications for Nursing.

The challenge for nurses is to incorporate effective smoking cessation interventions into clinical practice. DeClemente, et al. (1991) suggest that subjects in the precontemplation stage benefit from less intense but repeated contacts. Nurses have contact with patients in primary care settings, and hospitals, therefore they are in an ideal position to give repeated interventions. The demographic information showed the mean age at which the subjects started to smoke was 17.7 years. This indicates a need to educate students at junior high school on the dangers of smoking. The challenge for nurse educators is to incorporate education on successful stage-matched smoking cessation interventions into nursing curriculum. The challenge for nurse administrators is to support the introduction of effective smoking cessation interventions by nurses in both acute care settings and primary care settings.

Recommendations for Research.

Further research should be done using a larger sample size, and a quasi-experimental research design. Follow up after the intervention should be done at one month, three months and six months. DeClemente, et al. (1991) categorized the stages in a time frame of six months. They found that the proportion of subjects who moved to the next stage increased at the six-month follow up.

Subjects taking part in this study were asked if they intended to quit smoking in a period of time. This resulted in yes and no answers. The data for the study were therefore nominal level data. In addition the data collection tools should be modified to provide interval level data so that inferential statistics would be used for analysis. Asking the participants to specify a time period until they intended to stop smoking would provide interval level measurement.

Comparing the demographic information of patients in different stages of change may provide information that could be used to increase the effectiveness of smoking cessation interventions. For example it may be that there is a correlation between the length of time subjects have smoked and stage of change, so that smokers who have been smoking for a longer period of time are more resistant to change. There may be a correlation between number of quit attempts and stage of change. In 1999 Hill Rice completed a meta-analysis to determine the effects of nurse delivered smoking cessation interventions. Results of the meta-analysis suggest that multiple factors should be considered when providing smoking cessation interventions. Attention should be paid to decisional balance. Prochaska & Velicer (1997) described temptation as the urge to engage in an unhealthy behavior in a difficult situation. The three most tempting factors

were found to be emotional distress, social situations and craving. Research should be done to determine how these tempting factors can be addressed to either reduce or eliminate them.

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APPENDIX

Appendix A

Verbal Script

My name is Barbara Goudie and I am a nurse at Spectrum Health Butterworth campus and a graduate student at Grand Valley State University. Do you feel comfortable enough for me to explain a research study I am doing to complete my graduate studies? Yes ____No____.(If yes the verbal script will be read; if no, I will excuse myself from the potential subject and notify the patients nurse of he state of discomfort). One model of smoking cessation looks at how close smokers are to quitting, these are the stages of change. I am doing a study to examine the stage of change of people who are smokers. If you agree to take part in the study I will ask you to sign a consent form, and ask you some questions about yourself and your smoking history. This information will be kept confidential, and will not have your name on it. A month after your discharge from the hospital I will call you and ask you questions about your stage of change at the time the call is made. I will give you my phone number and the phone number of Paul Huizenga the chairperson of the Grand Valley State University Human Research Review Committee and you are free to contact us at any time if you have questions. Your participation in the study is voluntary and you may withdraw from the study at any time.

Appendix B

Consent form.

Study to test nursing smoking cessation interventions on the stage of behavior change of smokers.

This is a research study to examine stages of change for people who are smokers. The knowledge gained from this study may help nurses and physicians care for patients in a manner that will be responsive to the needs of patients who smoke cigarettes.

Participation in this study will involve one 15-minute interview regarding my smoking history by a registered nurse which will occur during my hospital stay, and then a follow-up phone call one month later.

Based on information gained at my interview I may be given information in the form of booklets about smoking cessation.

I have been selected to take part in this study because I smoke cigarettes and I am 18 years of age or older.

There are no direct benefits or risks to my participation but it may be useful in helping me to quit smoking.

The information I provide will be kept strictly confidential to the extent permitted by law, and the data will be coded so there are no personal identifiers. Original signed consents will be kept separate from the data, and in a locked file. Records must be kept for no less than 3-5 years after study closure. Study results reported in the literature will be group results and will not identify me.

A summary of the results will be made available to me upon my request.

Patient's initials _____

I acknowledge that:

I have been given the opportunity to ask questions regarding this research study and these questions have been answered to my satisfaction.

My participation in this study is voluntary and I may withdraw my consent at any time without it affecting the care or treatment I receive from my physician or staff at Spectrum Health Butterworth campus. My decision will not result in any loss of benefits to which I am otherwise entitled. The investigator or their designee, representatives from Spectrum Health and or the Food and Drug administration may inspect my records when appropriate if necessary. My confidentiality will be preserved to the extent permitted by law.

The investigator Barbara Goudie has my permission to review my nursing profile.

I thereby authorize the investigator to release information obtained in this study to scientific literature. I understand that I will not be identified by name.

I have been given the phone number of Barbara Goudie 1-616-391 1740, and I may contact her if I have any questions about the study. I may also contact Paul Huizenga 1-616-895-2472 the Chairperson of Grand Valley University Human Research Review Committee or Linda Pool at 1-616-391-1291 Spectrum Health Human Rights Representative, to answer any questions about my rights as a research participant.

I acknowledge that I have read and had my questions answered regarding the above information, and that I volunteered to agree to participate in this study. I will be given a signed copy of this consent form.

Patient's initials _____

Witness

Participant's signature

Date

Date

_____ I am interested in receiving a summary of the study results.

The phone number for my follow-up interview is _____ ID# _____

6sept01

Appendix C

Demographic data collection form.

Date: _____ ID # _____

1. How old are you? _____ (in years) _____

2. Are you? 1. male _____ 2. Female. _____

3 What is your marital status?

1 _____ Single

4. _____ Separated.

2. _____ Married

5. _____ Divorced

3 _____ Widowed

6. _____ Other (please specify)

4. What is your race?

1. _____ White.

4. _____ Native American Indian.

2. _____ Black

5. _____ Asian/Pacific islander.

3. _____ Hispanic.

6. _____ Other (please specify).

5. What is your highest level of education?

1. _____ Some high school

4. _____ Associate degree.

2. _____ High school graduate.

5 _____ Bachelors degree.

3. _____ Some college

6. _____ Masters degree.

6. Why are you in hospital?

- | | |
|-------------------------|---------------------------|
| 1. _____ Heart disease. | 4 _____ Surgery. |
| 2. _____ Lung disease | 5. _____ Other. (specify) |
| 3. _____ Diabetes. | |

7. Which members of your family smoke?

- | | |
|-------------------|-------------------------------|
| 1. _____ Husband. | 4. _____ Father. |
| 2. _____ Wife | 5. _____ Brothers or sisters. |
| 3. _____ Mother. | 6. _____ Other. |

8. How many years have you been smoking? _____

9. At what age did you start smoking? _____

10. How many times have you tried to quit? _____

Appendix D

Data collection tool for follow up phone calls.

ID number _____

1. Have you smoked any cigarettes in the last month?

1. _____ Yes

2. _____ No

2. Do you intend to quit smoking in the next six months?

1. _____ Yes

2. _____ No

3. Do you intend to quit smoking in the next month?

1. _____ Yes

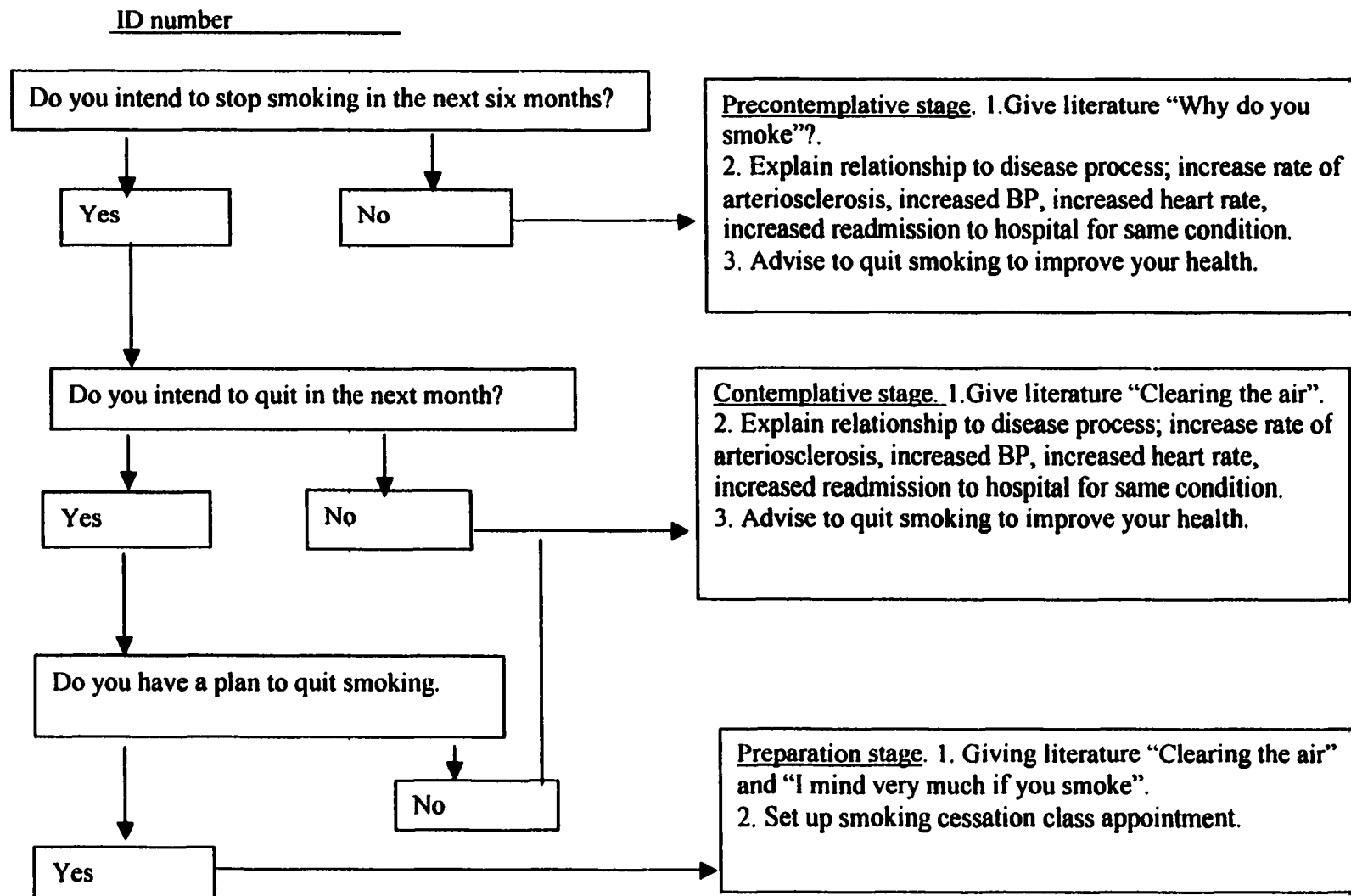
2. _____ No

4. Do you have a plan to quit smoking?

1. _____ Yes

2. _____ No

Appendix E Revised Intervention Protocol for Study.



Appendix F

IRB approval from Grand Valley State University



August 17, 2001

Barbara Goudie
11901 Gamsey Ave.
Grand Haven, MI 49417

RE: Proposal #02-06-H

Dear Barbara:

The Human Research Review Committee of Grand Valley State University is charged to examine proposals with respect to protection of human subjects. The Committee has considered your proposal, **Study to Test Nursing Smoking Cessation Interventions on the Stage of Change of Smokers**, and is satisfied that you have complied with the intent of the regulations published in the Federal Register 46(16)8386-8392, January 26, 1981.

NOTE: A copy of Spectrum's approval must be sent to my office after Spectrum has reviewed and acted on this proposal. Please forward this to:

Paul Huizenga
Grand Valley State University
Department of Biology
234 Padnos
Allendale, MI 49401

Sincerely,

A black rectangular box redacting the signature of Paul A. Huizenga.

Paul A. Huizenga, Chair
Human Research Review Committee

Appendix G

IRB approval from Spectrum Health



Spectrum Health

Butterworth Campus
100 MICHIGAN STREET NE GRAND RAPIDS MI 49503-2500
616 391 1774 FAX 391 2745 www.spectrumhealth.org

September 14, 2001

Barbara Goudie
11901 Garnsey Ave
Grand Haven, MI 49417

Dear Barbara,

By means of the expedited review process your study titled, " Study to Test Nursing Smoking Cessation Interventions on the Stage of Change of Smokers", dated 9/6/01 was given approval by the Spectrum Health Research and Human Rights Committee. Any changes made to the study, including informed consent changes, following this approval, require submission in writing and approval of the Committee before the changes are implemented. **The Spectrum Health number assigned to your study is # 2001-124 Please use this number as a reference in all Correspondence with the Research Office.**

This approval does not include the awardence of any monies for your study.

Please be advised that any unexpected serious, adverse reactions must be promptly reported to the Research and Human Rights Committee within five days; and all changes made to the study after initiation require prior approval of the Research and Human Rights Committee before changes are implemented.

The Research and Human Rights Committee and the F.D.A. requires you submit in writing, a progress report to the committee by August 1, 2002 and you will need reapproval should your study be ongoing at that time. Enclosed are some guidelines, entitled "Protocol Points", for your convenience in working with your study.

If you have any questions please phone me or Linda Pool at 391-1291/1299.

Sincerely,

Jeffrey S. Jones, M.D.
Chairman, Spectrum Health Research and Human Rights Committee

JSJ:gv

c: file