A COMPARISON OF ANXIETY RESPONSES IN CHILDREN UNDERGOING A SURGICAL PROCEDURE

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B.S.N., University of Victoria, 1982

A Thesis Submitted in Partial Fulfilment of the
Requirements for the Degree of

MASTER OF ARTS

in the Faculty of Education

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ABSTRACT

By means of a 24-item self-report test of fears to hospital, the Thermometer Fears Test and the apical heart rate, the anxiety responses of children who had attended a pre-operative preparation tour program were compared to the anxiety responses of children who had not attended the program. In addition, the anxiety responses of the children were examined by age, gender, and past experience with hospitals to ascertain whether significant differences would occur between the groups.

The subjects in the study were 37 children between the ages of 2 and 7 who were admitted for surgery to the Paediatric Surgical Daycare Unit of the Victoria General Hospital, Victoria, British Columbia. The anxiety levels of the children were evaluated on admission to hospital by using a 24-item self-report test of fears to hospital. A physiological measure of anxiety, the apical heart rate, was measured on admission and just prior to discharge from hospital, post-surgical procedure.

A two-factor analysis of variance was used for the

analysis of the self-reported fears and apical heart rate measurements. No significant differences in anxiety were demonstrated between the Tour and Non-Tour children on either of the two measurements. Female children demonstrated significantly higher anxiety responses than male children on the Thermometer Fears Test, but not on the apical heart rate measurements. No significant differences in anxiety were demonstrated between children grouped on the basis of, positive, negative or no past hospital experience. Parent's occupation appeared to affect whether children had attended the program. Implications of these results are considered.

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Acknowledgements

I wish to extend a special thanks to Denyse Koo, whose original efforts aroused my interest. In addition, I would like to thank the staff of the Paediatric Surgical Daycare Unit of the Victoria General Hospital, for assisting with my data collection efforts. Finally, I wish to thank my husband John, and my sons Scott and Ryan, for their never failing support and encouragement.

Dedicated to my late

father-in-law, Gordon Howard Stevenson, who

always supported my endeavours and

always had faith in my abilities.

CHAPTER I

INTRODUCTION

In British Columbia between 1983-84, approximately 7.5% of the population of children under the age of 9 years were hospitalized for at least one night (Statistics Canada, 1983-84). This amounts to 26,143 cases.

Hospitalization for the young child is a stressful experience (Klinzing, 1977; Luciano & Shumsky, 1975; Thompson & Stanford, 1981). Health care agencies are concerned with the psychological effects of hospitalization upon the young child, and strategies have been developed to alleviate, or at least to reduce, these effects (King & Ziegler, 1981).

The child hospitalized for surgery presents the dual problem of being in hospital and facing surgery, both events combining to create an almost unbearably stressful experience. Beuf (1979) stated that "no prior experience in the young child's life is adequate preparation for surgery" (p. 146). A variety of types of pre-operative preparation teaching programs have been developed to reduce the emotional stress (anxiety) which a child facing surgery experiences. The purpose of pre-operative teaching programs

is to fully familiarize the child and family with hospital procedures, equipment and personnel, and to provide information about the events surrounding surgery. Ideally, the teaching benefits both the child and parents and results in the reduction of hospital-related anxiety. In order to determine whether a reduction in anxiety is achieved, the effectiveness of existing programs must be examined.

The chapter is divided into the following sections: (a) Statement of the Problem; (b) Purpose of the Study; (c) Research Questions; (d) General Procedures; (e) Limitations; (f) Definition of Terms; and (g) Summary.

Statement of the Problem

A variety of pre-operative preparation teaching programs have been developed by health care agencies, based on the premise that unknown events are potentially more stressful than those that are known. These methods include puppet shows, filmed modelling, play therapy, books and tours. However, these methods, according to Ferguson (1979), have not been evaluated thoroughly enough to demonstrate effectiveness. Additionally, Melamed and Siegel

(1975) recommended that research studies examining preparation program effectiveness utilize homogeneous age groups in order to establish age-specific responses and reactions.

The use of a tour type of preparation program was identified as the most frequently used method in a survey of 350 hospitals in the United States (Azarnoff & Woody, 1981). Blount (1987) has been critical of touring children in groups. He believed that the use of groups prevents the tour leader from being aware of the individual child's circumstances (i.e., fears or negative experience related to hospital or illness). In addition, the stress provoking nature of the hospital environment itself cannot be controlled in a tour situation (Azarnoff, 1983; Zweig, 1986).

The Paediatric Department of the Victoria General Hospital (VGH), Victoria, British Columbia has conducted a pre-operative preparation tour program since 1984. The program was developed to prepare children, 2-14 years of age, booked for any elective surgical procedure (e.g., myringotomy, strabismus repair), the following week. An

unpublished self-report survey conducted by Stevenson in 1988 indicated that parents believed that this program had been helpful in reducing hospital-related anxiety for themselves and their children.

The majority of children attending the VGH preparation tour program were 2-7 years of age (Stevenson, 1988). Crummette, Mills and Beale (1984), have suggested that children under the age of 7 need preparation for surgery immediately prior to procedures, whereas older children retain information from earlier preparation (i.e., two weeks prior). Piaget (1968) would describe the child from 2-7 years as pre-operational. This developmental stage is marked by egocentrism, physical orientation, and the child tends to be focused on the present state. Time concepts and memory are immature, and the young child is unable to perceive or describe situations in the same manner as older children or adults.

As the VGH program had not been formally evaluated, it was felt by this author that this study should be conducted to determine its effectiveness in reducing anxiety. This author further questioned whether the VGH tour type of

preparation program would be effective in reducing anxiety, specifically in the 2-7 year old age group due to their immature cognitive abilities.

Purpose of the Study

The purpose of this study was to examine the extent to which the VGH pre-operative preparation tour program affected the hospitalization anxiety responses in a group of children, 2-7 years old, facing surgery. Specifically, the study involved a comparison of hospitalization anxiety in a group of children, 2-7 years old, who attended the VGH program, and a group of children, 2-7 years old, who did not attend the program.

The results obtained in this study would supply data upon which the existing VGH program could be maintained, modified or revised. Additionally, the information provided by this study would add to the existing knowledge regarding the effectiveness of the tour type of preparation program in the 2-7 year old age group.

Research Questions

Main research question

1. Will children 2-7 years of age who attend the VGH preparation program demonstrate significantly less anxiety than those children 2-7 years of age who do not attend the program?

Additional research questions

1. Will there be any significant difference in the anxiety responses of male and female children?
2. Does past experience with hospitals have any effect on the anxiety responses of the children?

General Procedures

A quasi-experimental, control group design was chosen (Cates, 1985; Walker, 1985). Convenience quota sampling was employed to ensure that similar numbers of children were represented in the age groupings 2-3, 4-5 and 6-7 years, in

both the treatment (Tour), and control groups (Non-Tour). Participants for the study were recruited from the Surgical Daycare Unit of the Victoria General Hospital. Written informed consent was obtained from parents prior to inclusion of their child in the study.

The anxiety responses of the children were measured using the apical heart rate and the Thermometer Fears Test. The children were tested individually upon arrival to the Paediatric Surgical Daycare Unit and prior to the admission procedures. An apical heart rate was obtained, followed by the Fears Thermometer Test. A second apical heart rate was obtained following the surgical procedure and just prior to discharge home. A Thermometer Fears Test was not administered following the surgical procedure.

The apical heart rate was chosen as an easily obtainable physiological measure of anxiety. The apical heart rate in the body is controlled by the cardiac centre in the medulla oblongata of the brain (Chaffee & Greisheimer, 1969). The sympathetic or accelerator fibres of the spinal cord conduct impulses which speed and strengthen the heart beat. In the young child, due to the immaturity in the nervous system,

the heart rate is particularly susceptible to anxiety or fear. This response results in an increase in the beats per minute taken by the use of a stethoscope.

Burling and Collipp (1969) showed that the apical heart rate was a valid and reliable measure of anxiety, as children recorded a change of ten apical beats per minute or more following admission to hospital. They also found that children under four had twice as many increases over the normal apical rate as those over four. These changes were significant in children during stressful procedures (i.e., injection).

In a similar manner, Johnson, Kirchhoff and Endress (1975) found the use of the apical heart rate to be valid and reliable as a physiological measure of anxiety in a study of children undergoing a cast removal procedure. They reported mean heart rate changes that were in the same order as the self-reports of anxiety.

The apical heart rate has also been used in studies related to the fear of needles in children (Fassler, 1985; Shapiro 1975). In the Fassler Study, children demonstrated significant reductions in apical heart rate following a

desensitization program. Shapiro (1975) utilized the apical heart rate and finger sweat as physiological measures of anxiety in a comparison of urban and rural children's fear of needles. She found the apical heart rate to be a valid and reliable measure, whereas a sweat test did not prove to be a useful measure.

This author believed that the use of the apical heart rate would be a valid, reliable and objective measure of anxiety which could be analyzed in conjunction with the more subjective self-report measure, the Thermometer Fears Test.

The Thermometer Fears Test measurement tool was chosen by the author, as it is an easily administered self-report measure of anxiety. The test utilizes a numbered, colour-coded thermometer which the child uses to indicate the degree of fear which a particular item invokes. A variety of types of numbered, colour-coded scales similar to the Thermometer Fears Test have been used as self-report tools to assess pain successfully in young children (Whaley & Wong, 1986).

The Thermometer Fears Test tool consists of 24 self-report measures of anxiety. Ferguson developed the tool in

1979 utilizing eight items from the Medical Fears Subscale (Scherer & Nakamura, 1968) which had been factor-analyzed from the Fear Survey for Children, plus eight items with face validity for assessing hospital fears, and eight non-related filler items (Ferguson, 1979). Ferguson found the tool to be valid and reliable in measuring hospital anxiety in children 3-8 years old (personal communication, 1989). The Fears Thermometer Test tool, has been used to measure hospital anxiety in a variety of studies (Strickland, Leeper, Jessee & Hudson, 1988).

Limitations of the Study

The study was limited to an examination of the Victoria General Hospital pre-operative preparation tour program. No attempt was made to generalize the findings of the current study to other pre-operative preparation programs.

The focus of the study was on children 2-7 years old, living in the Victoria area and admitted to the Paediatric Surgical Daycare Unit of VGH. Consequently the results should not be generalized to children of other age groups, or children living in other locations within the province.

Definitions

The following terms are defined for the purpose of the current study:

1. Admission - entry of a child as a patient into a hospital unit, as a result of an illness, or for the purpose of undergoing a surgical procedure. Admission is not used to refer to visits to the emergency department.
2. Admission procedure - a series of questions and procedures, (e.g., weight, height, temperature) undertaken when the child is admitted to hospital to provide a baseline of information in order to plan appropriate care.
3. Apical heart rate - the number of heart beats counted while listening through a stethoscope over the apex of the heart.
4. Myringotomy - minor surgical procedure requiring the surgical placement of small ventilating tubes in the inner ear.
5. Hospital experience - any experience with hospitals excluding admission to the surgical daycare unit, which

a child may have had prior to admission to the daycare. This includes: visiting relatives who are hospitalized; illness of relatives in conjunction with hospitalization; death in the family which was associated with hospitalization; visit to the emergency room department; participation in a hospital tour or program.

6. Pre-op teaching - individual teaching that is done the morning of surgery to prepare a child and parents for the anticipated surgical procedure.

7. Pre-operative preparation tour program - a formal program held each Tuesday and Wednesday at the Victoria General Hospital for one hour which prepares children and parents for a surgical procedure occurring the following week.

8. Paediatric Surgical Daycare (SDC) - program at the Victoria General Hospital, where children are admitted as daycare patients on the day of their surgical procedure and discharged approximately one to one and a half hours post- procedure.

9. Strabismus repair - minor surgical procedure entailing the correction of weak eye muscles.

Summary

The pre-operative preparation tour program at the Victoria General hospital was evaluated to determine its effectiveness in reducing the anxiety responses in children 2-7 years old who had attended the program. The age grouping 2-7 years was chosen due to its unique developmental characteristics and as it represented the majority of children who attend the program.

Two anxiety measurements were undertaken, one a self-report and the other a physiological measure. The results obtained were limited to urban 2-7 year old children and to the VGH pre-operative preparation tour program.

CHAPTER II

LITERATURE REVIEW

Introduction

The emotional needs of children in hospital began to be recognized after World War II (Nagera, 1978). Bakwin (1951) described the necessity of humanizing hospitals in order to meet the emotional needs of hospitalized children. At the same time, John Bowlby, the developer of an etiological theory of attachment in humans, made an impact on an international scale with his work for the World Health Organization which, in part, dealt with the existing care of sick children (King & Ziegler, 1981). Bowlby emphasized in his report the importance of keeping mothers and young children together in hospital due to the detrimental stress and anxiety caused by separation. In North America, Robertson (1953a), influenced by Bowlby, produced a film entitled "A Two Year Old Goes to Hospital", which depicted a two year old girl in hospital undergoing hernia surgery. This film dramatically illustrated the fact that a hospital experience for a young child has psychological ramifications following discharge (Robertson, 1953b).

Initial research studies showed that hospitalization had a negative effect on young children (Burling & Collipp, 1969; Mahaffy, 1965; Mason, 1965; Schaeffer & Callender, 1959). These studies identified behaviourial problems which were observed in young children in hospital, and which continued to be exhibited by these children in their home situations long after discharge. A study by Jessner, Bloom and Waldrodel (1977), found that 20% of children displayed severe reactions, such as eating, sleep and speech disturbances, tics and mannerisms, and fears or other regressive behaviour which often continued for extended periods of time after hospitalization. The implications of long term psychological problems motivated health care professionals to develop ways to alleviate, or at least to reduce, the detrimental effects of hospitalization. King and Ziegler (1981), in a review of the literature, identified several ideas which have been implemented by health care agencies in an attempt to reduce the effects of hospitalization. These ideas included: implementation of liberal visiting hours; development of play rooms; designing a home-like environment in paediatric units; provision of

rooming-in for parents and introduction of special hospital and surgical preparation programs.

The child in hospital who must have a surgical procedure presents the additional anxiety of surgery. Calkin (1979) stated that, "the young child's life is marked with conflict and hospitalization at this time constitutes a crisis" (p. 22). The hospital environment itself for a young child is anxiety-provoking (Hopkins, 1983; Klinzing, 1977; Robertson, 1983; Zweig, 1986). These authors identified several elements within the hospital setting which have been found to be anxiety-provoking to the young child. These included: the sight of equipment, the sounds which machines produce, the smells, the presence of people in uniforms, the number of unfamiliar people encountered, and the size of the hospital. In addition to this lack of familiarity with the hospital setting, two other factors have been found to consistently affect the degree of psychological upset which a child in hospital might experience. These are, separation from parents and the developmental age of the child (Lambert, 1984; Thompson & Stanford, 1981).

Pre-operative teaching programs are viewed as one way of reducing hospital-provoked anxiety in children who must have a surgical procedure. These programs are based on the premise that unknown events are potentially more stressful than those that are known. The inclusion of parents in a pre-operative preparation program was seen as crucial, as a reduction in parental anxiety would, in turn, facilitate a reduction in the child's anxiety. Studies have shown that children responded positively to parents who were able to support them physically and psychologically and a reduction in the child's anxiety was directly related to a reduction in parental anxiety (Vardo, 1978; Vistainer & Wolfer, 1975).

Vistainer and Wolfer (1975) described the three major components of the preparation of young children for surgery. These included: (1) giving factual information to the child and parents, (2) encouraging the child and parents to express their emotions, and (3) creating an atmosphere in which the child and parents have trust and confidence in the hospital staff.

A variety of methods for preparing children for surgery have been developed. These include: filmed modelling,

puppet shows, role playing, books and tours. The evaluations of these methods have not necessarily demonstrated effectiveness in reducing anxiety in the young child (Ferguson 1979). Specifically, Ferguson was concerned that programs were not necessarily designed to be age specific. She believed that results of studies of pre-operative programs which indicated an effective reduction in anxiety must be critically examined to determine in which age groups effectiveness was demonstrated.

The following literature review of a variety of pre-operative preparation programs is an attempt to delineate the effectiveness and limitations of each method. Special attention will be given to the 2-7 year old age group.

Pre-Operative Preparation Methods

Filmed-Modelling

The use of the filmed-modelling method of pre-operative preparation is loosely based upon the principles of Social Learning Theory. The underlying assumption is that if children view a film or video depicting a child coping with a hospital experience, they would learn, imitate, or model

the coping behaviours depicted.

The filmed-modelling method of preparation has been shown to be an effective method (Ferguson, 1979; Melamed & Siegel, 1975). These authors found that children who were shown a film depicting a child in hospital for surgery exhibited lower measured anxiety than those children who either watched an alternate film or were only given verbal explanations of what they might encounter.

Ferguson reported that children 3-4 years of age who had viewed the film, exhibited "greater hospital-specific anxiety than those of a 6 to 7 year old" (p. 662). Similarly, the findings of Melamed and Siegel (1975) indicated that younger children reported higher specific anxiety than older children. These investigators recommended that further research on the filmed-modelling method of preparation was necessary utilizing homogeneous age groups in order to establish age-specific responses and reactions.

Bandura (1977) suggested in his research on observational learning, that in real life, models are chosen depending upon the characteristics of the observer, the

characteristics of the model, and the situation in which the observation is occurring. Bandura further indicated that the complexity and perceived relevance of materials influenced attention. Programs utilizing the filmed-modelling method would need to be age-specific in order for children in the various age groups to relate to the model utilized in the program and indeed to imitate the coping strategies that are portrayed.

One of the limitations of the filmed-modelling method, is that it does not take into consideration the variety of ways in which children learn. Studies have indicated that the young child best accepts and integrates new information when the information is presented in a variety of sensory modalities (Azarnoff, 1983; Klinzing, 1977; Rodin, 1984). Presenting information in one manner as in filmed-modelling, may not prove meaningful to those children who need experiential participation, or learn best through other sensory modalities.

Puppet Shows

In puppet show preparation programs, puppets are

utilized to re-enact the various facets of hospitalization: admission procedures, preparation for surgery, the operating room, and the recovery room and post-surgical treatment. The basic puppet characters usually include a puppet family and hospital staff. The puppets talk about the hospital events and also talk about children's common fears (Johnson, 1974).

In examining the effectiveness of puppet show preparation, Johnson (1974) emphasized the importance of conducting the shows for age specific groups. He believed that young children respond better to simpler language and a shorter show then older children. Petrillo and Sanger (1980) examined the use of puppet shows and determined that effectiveness was related to the timing of the preparation rather then the preparation method itself. One study of the anxiety responses of preschoolers who had been prepared by the puppet show method found a reduction in measured anxiety of those children who had viewed the puppet show, compared to those that had not (Schulz, Raschke, Dedrick & Thompson, 1981).

Role Playing

Role playing is a method often used in conjunction with a hospital tour, discussion or video. The purpose is to provide the children with an opportunity to repeat the preparation experience in a variety of ways, and in their own way through play (Crocker, 1980; Rodin, 1984).

The role playing is intended to be therapeutic and not just diversional in nature. Lindquist (1983) indicated that the use of this method gives the staff an opportunity to respond to how the children use the equipment and clarify any misconceptions they might exhibit in the play situation. This opportunity for observation would also assist in identifying those children who, through their play, exhibit behaviours which indicate the need for individual attention.

The effectiveness of the role playing method in reducing hospital anxiety has not been evaluated. However, Thompson and Sanford (1981), have suggested that the value of this method lies in the fact that play is a natural component of each young child's repertoire. In addition, role playing provides children with an opportunity to assume the roles of doctors or nurses, and to be the administrators

of the medical attention on each other or on the dolls provided. This opportunity for role playing, according to Thompson and Stanford, gives a child control over a situation, which may, up to this point, not have been the case. Role playing or rehearsal of what children have seen demonstrated, in for example, a video, might also facilitate the retention of taught materials (Bandura, 1977).

Books

Various types of books have been utilized to prepare children for hospital. One of the advantages of books has been that they can be used many times. This repetition of materials may facilitate the retention of learned information. Books can also be used in a less anxiety-provoking environment than the hospital, for example, the home.

In a review of 150 colouring books used for hospital preparation, Azarnoff & Woody (1981) stated that, "most offered specific, brief information about the hospital, although not necessarily the child's experience there, or named the medical instruments depicted and rarely commented

on feelings about being in the hospital" (p.365). Concerns have been expressed that books may be so generic that they show situations which are not applicable to all hospitals nor to the individual child being prepared (Azarnoff & Woody, 1981; Azarnoff, 1985). Whaley and Wong (1983), have suggested that the use of books alone as a preparation method may not be effective in alleviating hospital-related anxiety. They suggest that in order for a child to perceive the hospital environment as positive, they should be exposed to that environment.

Tours

In a survey of 350 hospitals in the United States, conducted by Azarnoff and Woody (1981), tours and group discussion were the most frequently utilized methods of preparing children for hospital and for an impending surgical procedure. In this type of program, groups of children, and sometimes their parents, are given a tour throughout the hospital and shown those areas that they would most likely encounter during a hospital stay. These areas included, for example, the X-ray department, operating

room, recovery room and children's unit. Typically, following the tour, the group is assembled in a designated area and a discussion ensues regarding those things that had been observed on the tour. The discussion is intended as an opportunity to ask questions and clarification about misinformation that the child or parent might have. Specific information is given about the events that the child and parent might expect throughout the admission, pre-operative, and post-operative periods of their stay.

Blount (1987), expressed concerns about touring children in groups. He questioned whether tour leaders would be able to attend to the individual needs of children in a group situation. Additional concern related to tours centred on the stress-provoking nature of the hospital environment itself (Azarnoff, 1981; Zweig, 1986). Both Azarnoff and Zweig suggested that it was virtually impossible in a tour situation to control the sights, sounds and smells that a child might encounter on a tour and therefore the tour itself may be anxiety-provoking. Azarnoff (1983) pointed out that although hospital staff may try to create the least stressful situation and environment

possible, "stress children experience seems to have less relationship to actual life risk and more to the children's perception of risk" (p.32).

Travers (1982) described children's perceptions as being less vertical than those of adults. He explained that the reason for this is that children have less experience upon which they can build their expectancies. The non-vertical perception of the young child would tend to inhibit the purpose of tour preparation, that of familiarizing them with what they encounter in hospital, as they lack the experience which would assist in making the preparation meaningful.

Summary

Research has provided evidence of the anxiety-provoking nature of hospitalization to the young child. The child who is to undergo surgery faces an additional stressful experience. A variety of pre-operative teaching programs have been developed to provide children and parents with information about the impending surgical experience in order to reduce the anxiety associated with this event. It has

further been suggested that anxiety reduction may be age-specific, and that the programs developed need to take into consideration their target group, as programs may not meet the needs of a broad age range of children (Droske & Francis, 1981; Ross, 1984).

Studies which demonstrated the effectiveness of a particular preparation method have been limited, and the general applicability of the findings have been lacking. Based upon the review of the literature, it appears that there is a need for further research that attempts to determine the effectiveness of specific preparation methods in specific age groups. As the Victoria General Hospital preparation tour program has not been evaluated, it was apparent that such a study should be undertaken.

CHAPTER III

METHODOLOGY

Introduction

The purpose of this study was to examine the extent to which the VGH pre-operative preparation tour program affected the hospitalization anxiety responses in a group of children, 2-7 years old, facing surgery. Specifically, the study involved a comparison of hospitalization anxiety in a group of children, 2-7 years old, who attended the VGH program, and a group of children, 2-7 years old, who did not attend the program. Participants were recruited from the Paediatric Surgical Daycare Unit of the VGH.

The anxiety responses of the children were measured utilizing the Thermometer Fears Test and the apical heart rate. The anxiety responses of children who had attended the tour program were compared to the anxiety responses of the children who had not attended the program. Descriptive and quantitative statistics were utilized to analyze the data. Demographic data (i.e., age, sex,) were solicited to determine whether anxiety responses were specific to any particular characteristics of the sample.

This chapter is divided into the following sections: (a) Selection of Subjects; (b) Instrumentation, Description of Variables; (c) Procedure for Data Collection; (d) Research Questions; (e) Procedure for Analysis of Data; and (f) Summary.

Selection of Subjects

There were two groups of children recruited for this study from the Surgical Daycare Unit of the Victoria General Hospital. One group had attended the pre-operative preparation tour program and one group had not attended. The names of children who met criteria for inclusion in the study were obtained from the admitting department charts and the paediatric daycare operating room slates which list the names of children who were to be admitted to the Surgical Daycare. Quota, non-random sampling was used to ensure that there were equal numbers of each age grouping in both the treatment and control groups. Children who met the inclusion criteria and who fit into the appropriate age group were chosen.

To be a participant in this study, children were

required to meet the following criteria:

1. No previous hospital admission;
2. Admitted for either myringotomy and tube or strabismus procedure;
3. Child and at least one parent spoke english;
4. Be between 2-7 years of age.

All of the treatment or Tour Group of children attended one of the pre-operative preparation tour program sessions offered by the Child Life Department. The tour program, conducted by a member of Child Life, consisted of a tour of the Surgical Daycare followed by a picture story and play time.

The Child Life Staff met each group of treatment children and their parents at the main hospital entrance. The children and parents were escorted to the Paediatric Surgical Daycare Unit, where the children were shown the physical lay-out of the room and demonstrations of the weigh scales, crib sides, electronic thermometer, and stethoscope. Each child was afforded the opportunity to work the various pieces of equipment. After the tour, the children were taken to the playroom where they were shown a series of

pictures depicting a boy admitted to hospital for surgery. A picture story was told in a way which featured his pre-op and post-op experiences and ultimately his return home. Emphasis was placed on the facial expressions of the boy in the pictures and the children were encouraged to discuss how the boy was feeling. The boy's abilities to cope were also highlighted in the story (i.e., "See how still he lies when having his shot. See how he is smiling. He feels better").

Following the story, the children were encouraged to play with the toy hospital ward and hospital equipment. At this time, the Child Life Staff answered any questions, clarified and reinforced the information that was seen and heard during the story. At the end of the play time, the children were given a popsicle and returned home with their parents.

The control or Non-Tour Group of children did not attend any of the pre-operative preparation program sessions.

Instrumentation/Description of Variables

The two dependent variables in this study were the

apical heart rate and the Thermometer Fears Test. The apical heart rate has been shown to be a valid and reliable physiological measure of anxiety in young children (Burling & Collip, 1969; Fassler, 1985; Johnson, Kirchhoff & Endress, 1975; Shapiro, 1975). The average apical heart rate for a 2-3 year old is 100-110 beats per minute, and for a 4-7 year old is 90-100 beats per minute (Whaley & Wong, 1983).

The Thermometer Fears Test is a 24 item self-report measure of anxiety (Appendix A). Developed by Ferguson in 1979, the Thermometer Fears Test consists of 8 items from the Medical Fears Subscale (Scherer & Nakamura, 1968), which has been factor analyzed from the Fear Survey for Children, plus 8 items with face validity for assessing hospital fears, and 8 non-related filler items. The tool includes items such as "How afraid are you of going to the doctor?" and "How afraid are you of people who wear masks?" The children utilize a numbered, colour-coded thermometer to indicate degrees of fear ranging from 1 to 5, with 5 being the most afraid.

The independent variables included, gender, age and past hospital experience. The age and gender variables were

utilized to identify whether anxiety responses were age or gender specific. Previous hospital experience was included as a variable, as, Salkind (1981) found that past experiences have an effect on present and future behaviour. The investigator was therefore interested in identifying whether self-reported positive, negative or no hospital experiences which did not include a hospital admission, would affect the measured anxiety responses of the study children.

Procedure for Data Collection

Data was collected over a four month period of time, (August-November, 1990), in the Paediatric Surgical Daycare Unit of the Victoria General Hospital. Parents of potential subjects were contacted by telephone by the investigator and the nature of the study was explained, a copy of which is included in Appendix B. Verbal consent was obtained, and on the day of admission the investigator obtained written informed consent (Appendix C). Those parents, who could not be contacted by telephone, were approached on the day of admission in the Paediatric Surgical Daycare Unit. All

parents were informed of the nature of the study, the measurement tools which would be used and the fact that the identity of their child would be protected as only their hospital number would be utilized. Parents were also reassured that they could drop out of the study at any time, for any reason.

Information about previous hospital experiences and the was collected while each child was being tested by means of a background information form (Appendix D). Each child was tested individually by the investigator before the child was admitted to the Surgical Daycare Unit. An apical heart rate was taken prior to administration of the Thermometer Fears Test. The results of the apical heart rate measure constituted the pre-surgical procedure heart rate measure of anxiety. The order of testing was chosen in this manner as this author believed that administering the Thermometer Fears Test first could potentially be anxiety-provoking and could therefore affect the results of the apical heart rates.

Following the surgical procedure, just prior to discharge, another apical heart rate measurement was

obtained. The results of the second apical heart rate measurement obtained prior to discharge constituted the post-surgical procedure anxiety measure. A Thermometer Fears Test was not administered prior to discharge.

Research Questions

Main research question

1. Will children 2-7 years of age who attend the VGH pre-operative tour program demonstrate significantly less anxiety than those children 2-7 years of age who do not attend the program?

Additional research questions

1. Will there be any significant differences in the anxiety responses of male and female children?
2. Does past hospital experience have any affect on the anxiety responses of the children?

Procedure for the Analysis of Data

The individual scores on the Thermometer Fears Test were tabulated. The mean value and standard deviation were computed for each of the fear items. An analysis of variance was used to compare the responses on the fears items between the Tour and Non-Tour Groups. A further analysis of variance was computed on these scores to compare male and female respondents.

The mean value and standard deviation of the admission (pre-surgical) and post-surgical apical heart rates were computed. A comparison of the Tour and Non-Tour childrens' heart rates was conducted using analysis of variance. A further analysis comparing the pre- and the post-surgical apical heart rates for the male and female children was undertaken.

Past hospital experience, excluding admission, was examined in relation to the Tour and Non-Tour children and analysis of the Thermometer Fear Test scores and the apical heart rates were conducted to determine if differences between experience groups existed. In addition, a description of trends and patterns was undertaken.

Summary

Participants who met study criteria were recruited from the Surgical Daycare Unit of the Victoria General Hospital. The anxiety responses of each child were measured utilizing the Thermometer Fears Test and the apical heart rate. Both measurements were taken just prior to admission to the Paediatric Surgical Daycare Unit. A further apical heart rate was obtained just prior to discharge following the surgical procedure.

The results obtained were analyzed to compare the anxiety responses of children who had attended the pre-operative preparation tour program with the anxiety responses of those children who had not attended. Further analysis of the data was undertaken to compare the responses of male and female children, and the apical heart rate scores pre- and post-surgical procedure. Variations in the results were described to identify any apparent patterns or trends. In addition, the data was examined to identify the effect of previous hospital experience on the measured anxiety responses.

CHAPTER IV

RESULTS AND DISCUSSION

Introduction

The purpose of this study was to examine the extent to which the Victoria General Hospital pre-operative preparation tour program affected anxiety in a group of children, 2-7 years old, facing surgery. The anxiety responses of children 2-7 years old who had attended the VGH pre-operative preparation program were compared with the anxiety responses of children 2-7 years old who had not attended the program. The investigation attempted to answer the following questions:

1. Will children 2-7 years of age who attend the VGH preparation program demonstrate significantly less anxiety than those children 2-7 years of age who do not attend the program?
2. Will there be any significant differences in the anxiety responses of male and female children?
3. Does past experience with hospitals have any effect on the anxiety responses of the children?

The information presented in this chapter includes the

results obtained from the responses on the Fears Thermometer Test and the apical heart rates measured. The chapter is divided into the following sections: (a) Sample, (b) Analysis of Data, and (c) Summary.

Sample

Subjects were 37 children between the ages of 2 and 7 years who were admitted to the Surgical Daycare Unit of the Victoria General Hospital. Quota, non-random sampling was done to ensure that there were approximately equal numbers of each age grouping in both the treatment and control groups. Of the 37 subjects, 18 had attended the pre-operative preparation tour program and 19 had not attended the program. The distribution of subjects by age is summarized in Table 1. There was a fairly even distribution in the total sample with slightly more, approximately 38%, of the total number in the 6-7 year old age group. The Tour Group had the largest percentage of subjects in the 6-7 year old group, with approximately 39% compared to 28% in the 2-3 year old and 33% in the 4-5 year old groups. The Non-Tour Group had similar percentages in both the 4-5 and 6-7 year

old groups with 37% and the 2-3 year old group was 27% of the total.

Table 1

Subjects by Age, Tour and Non-Tour (N=37)

Age	No. of Subjects (% (of total group)	No. of Tour Subjects (% of subgroup)	No. of Non-Tour Subjects (% of subgroup)
2-3 yrs.	10 (27)	5 (27.8)	5 (27.4)
4-5 yrs.	13 (35)	6 (33.3)	7 (36.8)
6-7 yrs.	14 (38)	7 (38.9)	7 (36.8)
Total	37 (100)	18 (100)	19 (100)

The distribution of subjects by sex, Tour Group and Non-Tour Group are summarized in Table 2. Of the total subjects, approximately 35% were female children and 65% were male children. The Tour Group had 56% male children and 44% female children. The Non-Tour Group was comprised of 74% male children and 26% female children.

Table 2

Subjects by Sex, Tour and Non-Tour (N = 37)

Sex	No. of Subjects (%)	No. of Tour Subjects (%)	No. of Non-Tour Subjects (%)
Male	24 (64.9)	11 (55.6)	14 (73.7)
Female	13 (35.1)	8 (44.4)	5 (36.8)
Total	37 (100)	18 (100)	19 (100)

The subjects' previous experiences with hospitals (not including admission) are summarized in Table 3. It should be noted that the perception of previous hospital experiences as positive or negative was determined by the subjects or their parents.

Approximately 43% of the total number of children reported positive previous experiences with hospitals. 50% of the Tour Group of children reported their previous experiences as positive with only 16% reported as negative. This contrasted with the Non-Tour Group as 48% reported negative previous experiences and 36% as positive. The higher reported positive experiences of the Tour children may be a reflection of the positive influence of the pre-

operative preparation program. It is interesting to note that of the Tour children only 17% reported a past negative experience and 33% reported no previous experiences with hospitals.

Table 3

Subjects by Previous Hospital Experience, Tour and Non-Tour Groups (N = 37)

Experience	No. of Subjects (%)	No. of Tour Subjects (%)	No. of Non-Tour Subjects (%)
Positive	16 (43.2)	9 (50.0)	7 (36.8)
Negative	12 (32.4)	3 (16.7)	9 (48.4)
No Experience	9 (24.4)	6 (33.3)	3 (15.8)
Total	37 (100)	18 (100)	19 (100)

ANALYSIS

Reliability Analysis - Thermometer Fears Test

The Thermometer Fears Test consisted of 24 fears items which were scored from 1-5 by each of the subjects, with 1 being the" least afraid" and 5 being the " most afraid". The scores from 1-5 for each fear item were tabulated for

frequency and percentage of response.

Prior to further analysis, any fears item which 20% or more of the children did not respond to was dropped from further analysis. The six items deleted were fear of mistakes, punishment, germs, car sick, airplane travel and difficulty breathing. Of the original 24 fear items, 18 were retained. Any missing responses on the 18 retained fears items were assigned a neutral score of 3 to facilitate analysis. In order to ensure that this procedure would not alter the original results of the data, a reliability analysis was conducted and is summarized in Table 4. The reliability analysis indicated that the corrected fears items (alpha .8370) were highly correlated with the total fears construct. Therefore, it is likely that, the basic fears construct was altered only minimally by utilizing a neutral value of 3 for any fear item where a response was not recorded.

Table 4

Reliability Analysis - Thermometer Fears Test (N=37)

18 Fears	Corrected Item Total Correlation	Alpha if Item Deleted
Sharp	.4685	.8272
Hospital	.3220	.8340
Shot	.4886	.8279
Spider	.4914	.8258
Dark	.5254	.8238
Dentist	.4080	.8308
Dog	.4771	.8268
Docto	.4388	.8286
Haircut	.1812	.8287
Blood	.2885	.8351
Water	.6400	.8180
Alone	.2532	.8376
Operation	.5553	.8218
Ghosts	.2441	.8395
Masks	.5591	.8230
Cut	.5758	.8214
Fall	.4170	.8298
Storm	.4007	.8305

ALPHA = .8370

Main Research Question

The main research question in this study was, would children 2-7 years of age who attend the VGH pre-operative preparation tour program demonstrate significantly less anxiety than those children 2-7 years of age who do not attend the program? Analysis of the scores on the Thermometer Fears Test and the measured apical heart rates were conducted to determine if significant difference

between the Tour and Non-Tour Groups existed.

Thermometer Fears Test - Tour/Non-Tour Groups

The mean scores and standard deviation for all ages for each fear item are presented in Table 5. The table is divided into rank ordered hospital-related items and filler items.

The highest mean score of 4.459 and one of the smallest spread in the scores (SD = 0.830), was recorded for shots. On the hospital related items, sharp objects and cuts had high means of 2.857 and 2.882 respectively, although the spread of scores was higher for sharp objects (SD = 1.089) and for cuts (SD = 1.225).

In the total group the greatest disparity in scores in the hospital-related fear items was in the fears of the dark and of being alone. The SD for fear of the dark (SD = 1.325) and being alone (SD = 1.343). This reflects the difference in anxiety between the 2-3 year old children who responded with high anxiety to being alone and the dark, and the 6-7 year old children who responded with low anxiety scores on these items.

The mean on the item fear of doctors for the total group was 1.639 and indicated the greatest most consistency in scoring on the hospital-related items (SD = .762). This may indicate that children did not associate a visit to the doctor as a fearful event.

Table 5

Mean and Standard Deviation for All Subjects by Fear Item (N=37)

Fear Item (Hospital Related*)	Mean	Standard Deviation
Shot*	4.459	.830
Cut*	2.882	1.225
Sharp*	2.857	1.089
Operation*	2.629	1.285
Alone*	2.595	1.343
Dark*	2.541	1.325
Masks*	2.394	1.197
Fall*	2.229	1.140
Hospital*	2.054	.970
Blood*	1.941	1.153
Dentist*	1.806	1.046
Doctor*	1.639	.762
Dog	2.865	1.159
Spider	2.811	.371
Storm	1.867	1.279
Water	1.784	1.084
Ghosts	1.485	.972
Haircut	1.472	.845

The mean score for each fear item in each age group was calculated and the standard deviation for each item was computed. The means and standard deviations for each item for the Tour Group of children are presented in Table 6, and in Table 7, for the Non-Tour Group of children. The scores on the hospital-related items were then examined to determine if differences between the two groups existed.

For all age groupings in both Tour (T) and Non-Tour (NT) groups the highest mean scores were recorded for the fear of shots. The highest mean score of 5.00 for shots was obtained in the 4-5 year old Non-Tour group and the lowest mean score of 3.00 was found in the 6-7 year old tour children. The mean score for shots is slightly higher overall for the Non-Tour Group. These findings are consistent with the finding of Shapiro (1975) which indicated that fear of needles is the number one concern of hospitalized children.

The 2-3 year old children in both groups indicated that the fear of being alone was their next highest fear with a mean score of 4.00 (T) and 4.20 (NT) respectively. This finding contrasted with the mean scores obtained on the fear

of being alone in the 4-5 and 6-7 year old children. In particular, the 6-7 year old Tour children had the lowest mean score on the alone fear item, 1.14. One of the largest differences in the scores between age groups was noted on this item as the SD was 1.06 (T), and 1.02 (NT). One explanation of the differences is that separation anxiety is high in the 2-3 year old age group, whereas the 6-7 year old children are usually enrolled in school and have therefore successfully learned to separate from parents (Whaley & Wong, 1986). This may also be a reflection of the concern of these young children that they may be left alone in a strange situation, namely, the hospital.

The mean score obtained for fear of the dark was higher for tour 2-3 and 4-5 year old children (3.80 and 3.50 respectively), than non-tour children of the same age group (2.80 and 2.86). The 6-7 year old children, in particular the Tour Group, reported scores which indicated less fear of the dark, with obtained means of 1.57 (NT) and 1.00 (T). There was more consistency on scores between age groups in the Non-Tour Group, (SD = 0.59), than the Tour Group,(SD = 1.12), for the item fear of the dark.

Fear of the dark is common in the 2-4 year old age group. Whalley and Wong (1983) have suggested that in the young child's mind, darkness may be associated with separation. Therefore, the high recorded scores for fear of the dark in the 2-4 year old age groups are consistent with the high recorded scores for the fear of being alone.

Both groups of 2-3 year old children had high scores for the items fear of cuts, sharp objects and falls. The 4-5 year non-tour children had the highest mean scores for fear of sharp objects and the 6-7 year old non-tour children had the highest mean score for fear of cuts. Falls were not highly scored for either the tour or non-tour 4-5 or 6-7 year old children. The differences between age groups may be a result of the concern of younger children of hurting themselves and the training that they have had about touching sharp things so as to not cut themselves.

The fear of operations was highest in the 6-7 year old non-tour children at 3.29. Perhaps this was due to lack of information about the events that were to occur in hospital due to not attending the program. It is interesting to note that both groups of 2-3 year old had low scores on this item

even though the non-tour children would not have had the same hospital preparation as the tour group. A lack of comprehension regarding operations may explain these low scores.

Table 6

Mean Scores by Age and Fear Item and Standard Deviation for Each Fear for the Tour Group (n=18)

	TOUR GROUP			
Fears (Hospital Related*)	2-3 yrs	4-5 yrs	6-7 yrs	Group SD
Sharp*	3.00	2.33	2.14	.51
Hospital*	1.60	2.67	1.43	.57
Shot*	4.40	4.67	3.00	.86
Spider	3.80	3.67	2.29	.71
Dark*	3.80	3.50	1.00	1.12
Dentist*	1.80	1.83	1.14	.29
Dog	3.00	2.67	2.43	.71
Doctor*	1.00	1.50	1.43	.29
Haircut	2.40	1.00	1.00	.66
Blood*	2.00	1.50	1.71	.30
Water	2.00	1.17	1.29	.30
Alone*	4.00	2.00	1.14	1.06
Operation*	1.20	2.83	2.14	.74
Ghosts	1.20	1.83	1.71	.16
Masks*	1.60	2.50	1.43	.37
Cut*	3.20	2.67	2.29	.71
Fall*	3.20	2.00	1.57	.91
Storm	1.60	1.83	1.00	.43

Table 7

Mean Scores by Age and Fear Item and Standard Deviation for Each Fear for the Non-Tour Group (n=19)

	NON-TOUR GROUP			
Fears (Hospital Related*)	2-3 yrs	4-5 yrs	6-7 yrs	Group SD
Sharp*	2.20	3.57	2.14	.66
Hospital*	1.60	2.00	2.29	.28
Shot*	4.80	5.00	4.29	.30
Spider	2.80	2.29	1.71	.44
Dark*	2.80	2.86	1.57	.59
Dentist*	1.20	1.57	1.71	.50
Dog	4.00	2.43	2.29	.78
Doctor*	1.80	1.71	1.71	.04
Haircut	1.40	1.29	1.29	.05
Blood*	1.60	2.43	1.43	.44
Water	1.40	2.00	1.14	.36
Alone*	4.20	2.86	1.71	1.02
Operation*	1.40	2.86	3.29	.81
Ghosts	1.60	1.57	1.57	.01
Masks*	2.00	2.43	2.14	.18
Cut*	2.20	2.17	3.57	.54
Fall*	2.00	1.86	1.14	.37
Storm	3.40	1.86	1.29	.89

An analysis of variance shown in Table 8, was done to compare the total fears of the Tour and Non-Tour Groups of children. No significant difference among the Tour and Non-Tour Groups was demonstrated, $F(1, 35) = .204$, $p < .654$. This finding indicated that the anxiety responses of the tour children, although they had attended the pre-operative program, were not significantly different than the anxiety

responses of those children who had not attended. Therefore, it would appear that attendance in the pre-operative preparation tour program did not affect the anxiety responses of the children as measured by the Thermometer Fears Test. One explanation for this result may be that the content of the VGH preoperative preparation tour program is not age-specific enough, as it is provided to a wide variety of ages (2-14 years). Therefore, the specific learning needs of the children 2-7 years who attended were not addressed in such a generic program. In addition, the tour type of program format, may not have been conducive in meeting the individual anxiety needs of the tour children.

Table 8

Summary of Analysis of Variance of Total Fears by Tour and Non-Tour (N=37)

Sources of Variation	Sum of Squares	df	Mean Squares	F
Main effects group	22.451	1	22.451	.204*
Residual	3853.225	35	110.092	
Total	3875.676	36		

p* = .654

Apical Heart Rate/Tour - Non-Tour Group

In Table 9 are presented the mean heart rates and standard deviation for the Tour and Non-Tour Groups for both the pre-surgical and post-surgical measurements.

Table 9

Mean Pre- and Post-Surgical Apical Heart Rates for Tour and Non-Tour Groups (N=37)

Group	Pre-Surgical		Post-Surgical	
	M	SD	M	SD
Tour (n=18)	104.78	9.18	101.78	9.18
Non-Tour (n=19)	103.47	9.64	100.11	9.83

Both the Tour Group pre- and post-surgical apical heart rate means were slightly larger than the Non-Tour Group means. An analysis of variance of the pre- and post-surgical apical measurements was done to compare the Tour and Non-Tour Groups and the findings are presented in Tables 10 and 11.

There was no significant difference between the apical rates of the Tour and Non-Tour Group on either the pre- or post-surgical measurements. This finding is consistent with the results on the Thermometer Fears Test and again would

indicate that attendance in the pre-operative preparation tour program did not affect the anxiety responses of the tudy children.

Table 10

Summary of Analysis of Variance of Pre-Surgical Apical Rates by Group, Tour and Non-Tour (N=37)

Source of Variation	Sum of Squares	df	Mean Squares	F
Main effects group	15.720	1	15.720	.177*
Residual	3103.848	35	88.681	
Total	3119.568	36		

p* = .676

Table 11
Summary of Analysis of Variance of Post-Surgical Apical Rates by Group, Tour and Non-Tour (N=37)

Source of Variation	Sum of Squares	df	Mean Squares	F
Main effects group	25.856	1	25.856	.285*
Residual	3170.901	35	90.597	
Total	3196.757	36		

p* = .597

However, it is interesting to note that the Tour Group exhibited slightly higher anxiety than the Non-Tour Group even though they had been prepared for their hospital experience by attending the pre-operative program. Azarnoff (1981) and Zweig (1986) have suggested that tours may be anxiety provoking. This author is unable to provide a rationale to explain why the post-surgical apical heart rate mean in the Tour Group was also higher than in the Non-Tour group, unless perhaps the Tour group of children had a higher normal heart rate range than the Non-Tour group.

The post-surgical apical heart rate means for the Tour and Non-Tour groups were lower than the pre-surgical means, by a drop of 3 beats on average. This would suggest that both groups of children exhibited slightly less anxiety following their surgical procedure than upon admission. This finding is consistent with the apical heart rate changes reported by Johnson, Kirchhoff and Endress (1975) in their study of children's distress during orthopaedic cast removal. They found that the highest recorded apical heart rates occurred in the initial period of cast cutting and the lowest rates were recorded following the procedure.

Gender - Thermometer Fears Test

The total fear scores for the 18 fear items on the Thermometer Fears Test were calculated for each of the 37 subjects. The mean of the total scores and standard deviation was determined for the female and male groups of children. The mean for the total fears scores for the combined groups was 43.19. The female children's anxiety responses were markedly higher than the male children with a mean score of 48.15 and 40.50 respectively. In addition, the spread of scores for females in comparison to males indicated that the scores of female children, although not closely aligned(SD = 7.90), were more so than those of the male children (SD = 10.70).

The female children demonstrated significantly higher anxiety than male children as measured by the Thermometer Fears Test, $F(1, 35) = 5.113$, $p < .030$. The analysis is summarized in Table 12.

Table 12

Summary of Analysis of Variance of Total Fears by Gender (N=37)

Source of Variation	Sum of Squares	df	Mean Squares	F
Main effects group	493.983	1	493.983	5.113*
Residual	381.692	35	96.620	
Total	3875.673	36		

p* = .030

As the total number of female children represented 35% of the total population this result should be viewed with some caution. Nonetheless, this finding suggests that there is a gender difference in anxiety responses as measured by the Thermometer Fears Test with female children exhibiting higher anxiety than male children.

Gender - Apical Heart Rate

The mean heart rates and standard deviation for female and male children differed on the pre- and post-surgical measurements. The female children's mean score was higher

than the male children on both the pre- and post-surgical measurements. This finding is consistent with the results found on the Thermometer Fears Test. On the pre-surgical measurement, the female children's mean was only slightly higher than that of the male children, (104.46 vs. 103.92). The post-surgical mean for female children was also higher than that of the male children, (103.38 vs. 99.58). Female children had a wider variation in heart rate scores, (SD = 10.20) on the pre-surgical measurement and on the post-surgical measurement (SD = 9.71). It would appear by these results that female children exhibited a wider range of anxiety measured by the apical rate upon admission then just prior to discharge. The range of scores on the pre- and post-surgical measurements for male children indicated no appreciable difference in the range of scores, 9.01 and 9.19 respectively.

There was no significant difference demonstrated between the female children and male children on either the pre- or post-surgical apical measurements $\underline{F}(1, 35) = .028$, $\underline{p} < .868$ and $\underline{F}(1, 35) = 1.387$, $\underline{p} < .247$ respectively. The analyses are shown in Tables 13 and 14. These findings

differ from those of female and male children on the Thermometer Fears Test where significant differences were demonstrated. This may be related to the differences in the measurement tools with the Thermometer Fears Test being a more subjective measure of anxiety and the apical heart being a physiological measurement.

Table 13

Summary of Analysis of Variance of Pre-Surgical Apical Heart Rate by Gender (N = 37)

Source of Variation	Sum of Squares	df	Mean Squares	F
Main effects group	2.503	1	2.503	.028*
Residual	3117.064	35	89.059	
Total	3119.568	36		

p* = .868

Table 14

Summary of Analysis of Variance of Post-Surgical Apical Heart Rate by Gender (N=37)

Source of Variation	Sum of Squares	df	Mean Squares	F
Main effects group	121.847	1	121.847	1.387*
Residual	3074.910	35	87.855	
Total	3196.757	36		

p* = .247

Hospital Experience - Thermometer Fears Test

Past hospital experience, positive, negative or none was examined in relation to the total fear scores on the Thermometer Fears Test. The mean of the total fear scores for each experience group was calculated and is shown in the following Table.

Table 15

Mean of Total Fear Scores on Thermometer Fears Test by Experiences (N=37)

Experience Group	Mean	SD
Positive (n=16)	41.44	8.75
Negative (n=12)	44.58	11.91
No Experience (n=9)	44.44	9.19

Sixteen children reported a positive previous experience, 12 a negative experience and 9 reported no previous experience. The results indicated that a positive past experience with hospitals affected the anxiety responses of the study children, as the lowest mean for total fears was in the positive group, 41.44 vs. 44.58 (negative) and 44.44 (none). However the difference was not found to be significant. An analysis of variance of the total fear scores with past hospital experience did not demonstrate any significant difference between the positive, negative or no experience groups, F (2, 34) = .389, p < .681. The analysis is shown in the following Table.

Table 16

Summary of Analysis of Variance of Total Fear Scores by Experience (N=37)

Source of Variation	Sum of Squares	df	Mean Squares	F
Main effects group	86.599	2	43.300	.389*
Residual	3789.076	34	111.443	
Total	3875.676	36		

p* = .681

There was a very close similarity between the negative and no experience mean scores, 44.58 (negative) vs. 44.44 (none). This would indicate that children who have had no experience exhibit the same levels of anxiety as those that have had a negative experience. However, it is interesting to note, that of the 9 children reporting no experience, 6 had in fact attended the VGH preparation program. This result may be explained by the manner in which past experience was interpreted by and children, and that the tour was not considered a hospital experience. However, this would not explain why the no experience tour children exhibited very similar anxiety responses as those Tour and

Non-Tour children who had reported a negative experience. The investigator would question whether the tour had a negative impact on these particular children and whether this affected their anxiety responses.

Hospital Experience - Apical Heart Rate

Hospital experience, positive, negative or none was examined in relation to the pre-surgical and post-surgical apical heart rate measurements. The mean apical heart rates were calculated for the positive, negative and no experience groups for the pre-surgical and post-surgical measurements and are summarized in Table 17.

Table 17

Mean Apical Heart Rates Pre- and Post-Surgical Measures by Positive, Negative and No Experience (N = 37)

Group	Pre-Surgical x	Pre-Surgical SD	Post-Surgical x	Post-Surgical SD
Positive (n = 16)	104.13	10.44	100.38	9.72
Negative (n = 12)	104.67	9.36	101.33	9.43
None (n = 9)	103.33	8.0	101.33	9.95

The mean scores for the pre-surgical apical heart rate were higher than the post-surgical scores in all three groups. This would tend to indicate that all of the study children exhibited higher anxiety upon admission to hospital than after their surgical procedure was completed and just prior to discharge home.

The lowest mean score recorded on the pre-surgical measurement was in the no experience group. The pre- and post-surgical apical heart rates were analyzed by the three experience groups. No significant differences between the positive, negative or no experience groups were found on the pre-surgical measurement, $\underline{F}(2, 34) = .050$, $\underline{p} < .951$, or the post-surgical measurement, $\underline{F}(2, 34) = .044$, $\underline{p} < .957$. It would appear that previous experience with hospitals has little effect on the anxiety that children exhibit when admitted to hospital. This finding is consistent with the results obtained on the Thermometer Fears Test which also showed that previous hospital experiences did not significantly affect the anxiety responses of the children.

Summary

This study was an attempt to determine whether or not children attending a pre-operative preparation program would exhibit anxiety responses which were significantly different than children who had not attended the program. The total sample consisted of thirty-seven children, 2-7 years of age. Eighteen of the children had attended the Victoria General Hospital pre-operative preparation tour program and comprised the tour or treatment group. Nineteen children had not attended the program and comprised the Non-Tour or control group.

The anxiety responses of the children were measured utilizing a subjective self-report, the Thermometer Fears Test, and a physiological measure, the apical heart rate. The responses of the children on the Thermometer Fears Test and the apical heart rate measurements were tabulated and the means and standard deviations were calculated. The fear responses and the apical heart rates of the Tour and Non-Tour Groups were compared to determine if differences in anxiety existed. Although there were differences between the Tour and Non-Tour Groups' mean scores on several of the

fear items, an analysis of variance between the groups found no significance differences on the Thermometer Fears Test. Similarly, although there were slight differences in the apical heart rate measurements, no significant differences between groups was found on either the pre-surgical or post-surgical measurement.

The variables, gender, age and previous experience with hospitals were examined to determine if these variables affected the responses of the study children to the Thermometer Fears Test or the apical heart rate measurements.

Gender did affect the children's responses on the Thermometer Fears Test, as female children reported significantly higher anxiety than male children. However, on the apical heart rate measurements, no differences between female and male children were found. Past hospital experience did not significantly affect the anxiety responses on either the Thermometer Fears Test or the apical heart rate measurements.

CHAPTER V

IMPLICATIONS AND RECOMMENDATIONS

The major purpose of the present study was to examine the effects of a pre-operative preparation tour program on the anxiety responses of children 2-7 years of age admitted for minor daycare surgery to the Surgical Daycare Unit of the Victoria General Hospital, Victoria, British Columbia.

The main research question which the study attempted to answer was whether the anxiety responses of children who attended a pre-operative preparation tour program would differ from children who had not attended the program. Additional questions concerned variables which may influence anxiety responses, such as (a) age, (b) gender, and (c) previous experience with hospitals.

The chapter is divided into the following sections: (a) Summary of the Findings, (b) Limitations, (c) Implications and Recommendations, (d) Summary.

Summary of the Findings

The total sample consisted of thirty-seven children aged two to seven years. Included in the sample were,

twenty-four male children and thirteen female children. Of the 37, eighteen had attended the pre-operative preparation tour program at the Victoria General Hospital (Tour Group) and nineteen had not attended the program (Non-Tour Group). The anxiety responses of the participants were measured utilizing the Thermometers Fears Test and the apical heart rate.

The mean scores of the tour and non-tour children on the 18 fear items on the Thermometer Fears Test were calculated for each age group. The mean scores of the Tour and Non-Tour Groups in the 2-3, 4-5 and 6-7 age groups were compared to determine if differences between the two groups existed.

The highest mean score for a particular item for both groups was recorded for the fear of shots, with the Non-Tour Group having a slightly higher score than the Tour Group. The 2-3 year old children were more afraid of being alone than 4-5 and 6-7 year old children, and there was a wide variation in the scores on this particular item between the age groups.

The tour 2-3 and 4-5 year old children recorded higher

mean scores on the fear item being left alone than did the non-tour children. In comparison, the 6-7 year old children recorded very low mean scores on the this fear item, with the lowest mean score recorded for the 6-7 year old tour children.

The children 2-3 years had high scores for the fear items pertaining to cuts, sharp objects and falls. However, there was not consistency amongst age groups, or between the Tour and Non-Tour Groups on these fear items, as 4-5 year old children were more afraid of sharp objects and 6-7 year old children were more afraid of cuts.

It is interesting to note that the fear of an operation was highest for the 6-7 year old non-tour children and very low for both the tour and non-tour 2-3 year old children.

The mean scores for all ages for each fear item were calculated. Examination of the scores for all children indicated that fear of shots was the highest reported fear overall. The fear of doctors had the lowest SD and therefore the least spread of scores for all age groups and both tour and non-tour children was high. Significant differences on the Thermometer Fears Test, between the Tour

and Non-Tour Groups of children were not found.

The mean scores for the pre-surgical and post-surgical apical heart rates were calculated for the Tour and Non-Tour Groups of children. The Tour Group of children had slightly higher apical heart rate means on both the pre- and post-surgical measurements compared with the Non-Tour Group of children. However, the differences were not found to be significant. For both the Tour and Non-Tour Groups, there was a small reduction in apical heart rates between the pre- and post-surgical measurements, but this reduction was not significant. This may indicate that the anxiety of the children, measured by the pre- and post-surgical apical heart rates was slightly lower following the surgical procedure than upon admission. There were no significant differences demonstrated between the Tour and Non-Tour Groups of children on either the pre-surgical or post-surgical apical heart rate measurements.

The fear scores on the Thermometer Fears Test and the apical heart rate measurements of the female and male study children were compared. The female children reported higher anxiety responses on the Thermometer Fears Test than male

children. The anxiety responses of the female children were found to be significantly higher than the male children. This finding contrasted with the apical heart rate measurement findings. Although the female childrens' mean scores on both the pre- and post-surgical heart rate measurements were higher than those of the male children, no significant differences were found between the two groups on either of the two measurements.

The scores on the Thermometer Fears Test were examined in relation to the past hospital experiences of the study children. Past hospital experiences were reported as positive, negative or no experience. The children who reported a positive past experience had the lowest mean score for the total fear items on the Thermometer Fears Test. The mean scores for children who reported a negative or no experience were very similar. It was interesting to note, that included in the children who reported no experience with hospital, were children who had attended the pre-operative preparation tour program. An analysis of the total fear scores with past hospital experience, (i.e., positive, negative or none), did not demonstrate any

significant differences between the groups.

The pre- and post-surgical apical heart rate measurements were also examined in relation to previous hospital experiences; positive, negative or none. The pre-surgical heart rate means were higher than the post-surgical means in all three experience groups. It would appear by this finding that all of the children, regardless of past experience, exhibited more anxiety upon admission than after the surgical procedure just prior to discharge, although the finding was not significant.

The lowest pre-surgical apical heart rate mean was found for the no experience group. This contrasted with the results on the Thermometer Fears Test, as the no experience group on this test had virtually the same recorded anxiety responses as the negative experience group.

The post-surgical apical heart rate mean for the positive experience group was the lowest mean for the three experience groups on the two measurements. The pre- and post-surgical apical heart rate measurements were compared to the three experience groups. No significant differences on the pre- and post-surgical apical heart rate measurements

were found between the groups.

Limitations

This study was conducted in the Paediatric Surgical Daycare Unit of the Victoria General Hospital (VGH), and examined the VGH pre-operative preparation tour program, therefore, the results of this study cannot be generalized to other hospital settings within the province, or to other pre-operative preparation programs. Only children 2-7 years of age participated in this study and the results obtained cannot be generalized to other age groups. Participants had not been previously admitted to hospital. One cannot be assured that the responses of children 2-7 years of age who have had a previous hospital admission would be similar, consequently one can not generalize the findings to those children with a previous hospital admission.

Although the Thermometer Fears Test had been designed for children 3-8 years of age, children of all ages had difficulty answering some of the questions. Therefore, the results obtained utilizing this tool may not be a true representation of anxiety responses in this particular age

group.

Conducting the study in the hospital setting may have influenced the participants. There was no way of knowing whether anxiety-related to the hospital atmosphere affected the responses of the study children. Similarly, there was no way of effectively determining whether reported past experience with hospitals accurately reflected the experience of the study children.

As the sample was not randomly selected, it is difficult to ascertain whether or not the Tour and Non-Tour groups of children had similar characteristics. In addition, due the small size of the sample, it would be difficult to determine if this group would be representative of a population of 2-7 year old children.

Implications and Recommendations

Victoria General Hospital Pre-operative Preparation Tour Program.

This study was an attempt to determine if the VGH pre-operative preparation tour program affected the anxiety responses of children 2-7 years of age, whereas previous

studies of preparation programs have examined the affects of preparation on a broad age group of children (Droske & Francis, 1981; Ross, 1984). It would appear by this study that attendance in the pre-operative preparation tour program did not affect hospital-related anxiety. However, it is suggested that by examining the self-reported fears and apical heart rates of the children in this study, patterns have emerged which could be utilized to modify the existing program.

It is recommended that the existing program which is provided to a broad age range of children be revised in order to address the specific fears reported by the 2-7 year old children. For example, the overwhelmingly strong reported fear of shots in all of the age groups in both the Tour Group and Non-Tour Group could be the focus of the play time which currently occurs following the tour and picture story. Evans and Hansen (1981) have suggested that by utilizing the principles of preparing children for painful procedures and principles of development, the fear of needles can be significantly reduced. These principles could be utilized in the VGH program to deal with this fear

and to hopefully allay some of the anxiety associated with it. Therefore the play time portion of the current VGH pre-operative preparation tour program would more appropriately be utilized as a time for role playing. Lindquist (1983) suggested that the observations of health care professionals during the role play time would assist in identifying those children, who through their play, exhibit behaviours (such as fear of injections), which indicate the need for individual attention.

Attention to the 2-3 year old children's fear of the dark and of being alone could also be addressed within the existing program. Emphasis on these two fears could be incorporated into the existing picture story which currently portrays the experiences of a little boy as he goes through a hospital experience. Lambert (1984) has suggested that openly discussing children's fears, particularly the young child's fear of separation from , is the first step in beginning to deal with that fear.

The fears of cuts, sharp objects and falls could be categorized under the theme of fear of a painful experience. This investigator believes that these fears are similar to

the fear of shots and that utilizing the principles suggested for the fear of shots would also allay the anxiety associated with the pain associated with an impending surgical procedure.

Previous Hospital Experience From this study it would appear that past experience with hospitals had an effect on the children's anxiety. Children who reported a positive past experience had lower exhibited anxiety than those with reported negative or no past experience. Currently, information regarding the past hospital experience of children participating in the program, or indeed of any children admitted to the Surgical Daycare Unit of the Victoria General Hospital is not solicited. It would appear by this study, that information related to past experience would assist the health care professionals conducting the pre-operative program to identify those children who may be in need of additional attention as a result of their previous experience. It is recommended that the play time segment of the current program could be utilized to closely observe children who have reported a negative previous

experience. Health care professionals could assist these children to work through their past experiences in order for them to approach their impending surgical admission without the negative affects of a previous experience.

Travers (1982) has suggested that children have less experience upon which they can build their expectancies than adults. As the purpose of the preparation program is to prepare children for a surgical experience, those children with no previous hospital experience may need additional assistance during the play time to put into context what they have seen and heard during the pre-operative preparation program, in order to increase their comprehension of what they have been taught.

It would be equally or perhaps even more important for health care professionals to have information regarding past hospital experience for those children who have not attended the pre-operative preparation tour program. Currently, at the Victoria General Hospital, in addition to the pre-operative preparation tour program, pre-operative teaching is conducted for all children who have not attended the programjust prior to their surgical procedure. It would

appear that this teaching just prior to surgery could be individualized in a similar manner as that recommended for the pre-operative preparation tour program, for children with reports of a negative or no previous hospital experience.

Female/Male Children. From this study it appears that female children exhibit higher anxiety-related to hospitalization than do male children. It is difficult to determine, due to the small sample size, whether or not this finding is truly representative of differences between female and male children. Therefore, it is recommended that future studies related to hospital anxiety in children be designed with a sufficient sample size, to compare female and male children.

Pre-Surgical and Post-Surgical Anxiety. The findings in this study indicate that children did not experience any significant change in anxiety during the course of their hospital stay. This finding would suggest that efforts to reduce hospital anxiety should include not only pre-

operative preparation but also should focus on techniques to reduce anxiety throughout the child's hospital stay.

Hospital anxiety should be viewed on a continuum, with techniques and methods developed to assist children to cope with each aspect of their hospital stay. Following the surgical procedure, prior to discharge, a de-briefing type teaching session may be one method to assist children in dealing with their hospital experience. This session could be similar to the role playing session in the pre-operative preparation program, and could serve to provide children with an opportunity to re-enact their experience. This re-enactment would offer both health care professionals and the opportunity to observe and identify behaviours which would indicate the need for further individual attention. Such a session would also provide clarification for of their child's perception of the experience versus the experience itself. In addition, it is recommended that a handout sheet be developed for which would alert them to the typical post-hospitalization behaviours of children and some techniques for dealing with these behaviours.

Health Care Professionals. From this study it would appear that attendance in the VGH pre-operative preparation tour program does not significantly affect the anxiety responses of children 2-7 years of age. However, health care professionals conducting the program and those employed in the Paediatric Surgical Daycare Unit should not assume that this type of preparation program is not a worthwhile endeavour, but rather should strive for ways to continually improve the existing program in an attempt to lessent the obvious fears that children have.

The fact that children have attended the pre-operative preparation program does not mean that they will be less anxious than those children who have not attended. However, health care professionals caring for these children must not overlook the necessity of supplementing the pre-operative preparation of the children who have attended the program with similar individualized teaching as that which is done for children who have not attended the program. In order to individualize teaching, health care professionals need to be educated about the developmental stages of children and the variety of ways in which children learn. The existing pre-

operative preparation program should be viewed as only one of a variety of teaching opportunities which should be provided to children who are to undergo surgery, as opposed to the only opportunity.

Attention should also be focused on the many factors which may affect a child's reaction to hospitalization. It has been suggested that age, gender, past hospital experience and perhaps ' occupations are some of the factors which have an impact on the anxiety which children may exhibit when hospitalized. Evans and Hansen (1981) have further suggested that cultural background and responses to new situations may also have an effect on children's reactions to hospitalization. Therefore, the generic pre-operative preparation program alone cannot adequately prepare children, as, only through individualized teaching can the aforementioned factors be taken into consideration.

Health care professionals must also be aware that anxiety-related to hospitalization is a continuous process. Education related to the typical anxiety behaviours or manifestations of anxiety in the various age groups is necessary. Only through this type of education, will health

care professionals be able to identify, through observation, those children who are having particular difficulty coping with a hospital experience, and intervene appropriately. It is therefore recommended that health care professionals working with children in hospitals be educated about hospitalization anxiety and be taught a variety of teaching techniques and methods to assist children in coping with their anxiety.

Research

Although this study did not find any significant differences between those children who attended and those who did not attend the VGH preparation program, several interesting findings appeared which should be explored further. One examination that is recommended is whether or not the anxiety responses of female and male children would differ utilizing a larger sample. This investigator was unable to find evidence in the literature that studies related to gender differences have been undertaken. Results from a study of female and male children might provide valuable insight into how children of different genders

react to hospital situations. This information could assist in designing pre-operative preparation programs which would be gender specific, and which would more closely meet the needs of female and male children.

This study indicated that past experience with hospitals may affect children's anxiety responses. Further research examining the affect of past hospital experience on hospital anxiety is therefore also recommended. Additional information about how children will react to hospitals based on their previous experiences would influence the techniques and methods utilized to prepare them for hospitalization.

Anxiety responses were virtually unchanged throughout the hospital experience. Additional research is needed to identify whether post-hospitalization de-briefing would affect the hospital-related behaviours of children after they return home. This recommendation is particularly important in light of the severe behaviour disturbances which can occur following a hospital experience (Jessner, Bloom & Waldrodel, 1977).

In order for health care agencies to adequately prepare children for hospital, it is further recommended that

additional research is necessary to identify which types of preparation programs, in which age groups and under what circumstances will best meet the needs of these children.

Summary

The Victoria General Hospital provides a pre-operative preparation tour program which endeavours to prepare children for an impending hospital surgical experience. Although this study indicated that attendance in the program did not significantly affect the anxiety of the children who had attended the program, several suggestions based on the study results can be utilized to modify the existing program. The proposed modifications to the present program would provide a more comprehensive approach to preparing children in the 2-7 year old age group.

The purpose of pre-operative preparation programs is to fully familiarize the child and family with hospital procedures, equipment and personnel, and to provide information about the events surrounding surgery. Ideally, the preparation benefits both the child and results in the reduction of hospital-related anxiety. In order to achieve

these benefits, education of health care professionals regarding the variety of factors which may influence a child's response to hospitalization must be done. This education will assist these professionals to individualize preparation teaching in order to meet the needs of all children who are to be admitted to hospital.

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APPENDIX A

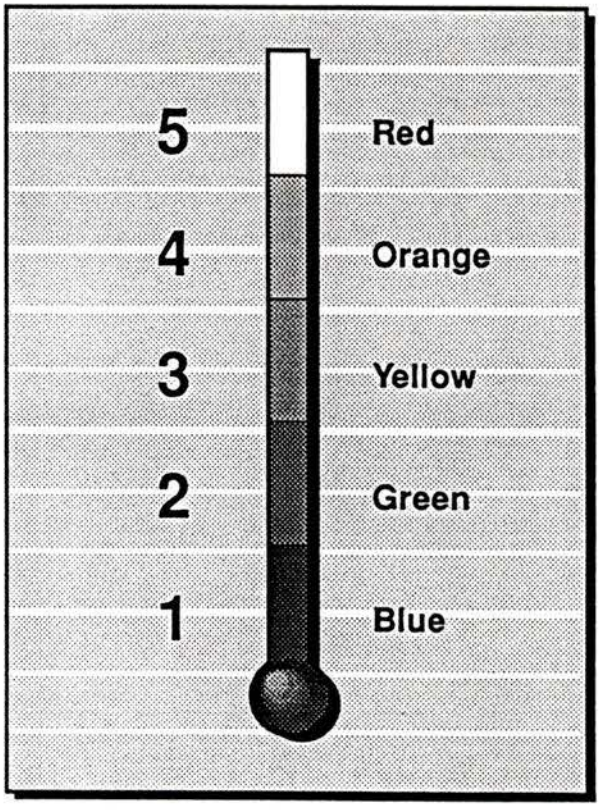
THERMOMETER FEARS TEST

Thermometer Fears Test

The experimenter will present the colour-number coded thermometer and explain that she and the child will now play a game. Instructions will be given as follows: "I'm going to ask you about some things that some kids are afraid of and some kids are not afraid of. I want you to tell me how afraid you are by pointing to one of these squares. This blue one (1) tells me you are not afraid at all; this green one (2) tells me you are a little afraid; this yellow one (3) tells me you are a fair amount afraid; this orange one (4) tells me you are pretty much afraid; and this red one (5) tells me you are very afraid. For each thing I say, point to the number or colour that tells me how afraid you are." If you don't understand a question or can't answer just tell me.

How afraid are you of:

Sharp objects
Having to go to the hospital
Getting a shot from a doctor or nurse
Making mistakes
Spiders
Going to bed in the dark
Going to the dentist
Strange dogs
Going to the doctor
Flying in an airplane
Getting punished
Getting a haircut
Germs or getting an illness
The sight of blood
Deep water
Being alone without your parents
Having an operation
Ghosts or other spooky things
Getting car sick
People wearing masks
Not being able to breath
Getting a cut
Falling from a high place
Thunderstorms



*Obtained by permission of F. Ferguson

APPENDIX B

TELEPHONE PROTOCOL

TELEPHONE PROTOCOL

Hello, this is Lynn Stevenson speaking, may I please speak to Mr./Mrs._____? I am a graduate student at the University of Victoria, and I am conducting a research study on children being admitted for surgery to the Paediatric Surgical Daycare Unit. I have obtained your son/daughters name from the admitting department and am phoning to request your permission to include your son/daughter in my study. In my study I am attempting to determine whether children who have attended the hospital surgery teaching program will be less afraid of the hospital than children who have not attended the program. If you agree to include your son/daughter, I will meet with you in the Surgical Daycare Unit at the time of your child's admission and ask you to sign a consent form. I will ask you a few questions and then will listen to your child's heart beat and ask him/her several short questions. The questions are a list of 24 common fears of children and I will be asking your child how afraid he/she is of each item. For example, I will ask, "How afraid are you of shots? How afraid are your of people who wear masks?" I will ask your

child to point to a scale which is both numbered and coloured to indicate how afraid he/she is of each item. The entire procedure will take approximately ten minutes. Following your child's surgical procedure and just before going home, I will take another heart beat. At any time you may withdraw your child from the study. The information that I will be gathering will be used for the purposes of statistical analysis only and the identity of your child will be protected. Do you have any questions? Do I have your permission to meet with you the morning of your child's surgery? I look forward to seeing your then.

APPENDIX C

CONSENT

CONSENT

I, (Parent or Guardian Name). do hereby give my consent to allow (Child's name) my (son or daughter) to participate in a study concerning the preparation of children for hospitalization and surgery. I am aware that (Child's name) will be given two tests now and one test just prior to discharge.

I have also been informed that I may withdraw my child from the study at any time, for any reason. In addition, I am aware that any information gathered will be used for the purpose of statistical analysis only.

Parent/Guardian signature

Date

APPENDIX D

BACKGROUND INFORMATION

BACKGROUND INFORMATION

Age: Sex:

Previous hospital experience of the child, including any exposure including visiting family, friends, visits to the emergency room etc.

How would the above hospital experience be perceived by the child

positive negative no experience

VITA

Surname: Stevenson Given Names: Roberta Lynn

Place of Birth: Winnipeg, Manitoba

Date of Birth: January 3, 1952

Educational Institutions Attended:

Vancouver General Hospital Nursing School	1970 to 1973
University of Victoria	1979 to 1982
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Degrees Awarded:

B.S.N.	University of Victoria	1982

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Title of Thesis: A Comparison of Anxiety Responses In Children Undergoing a Surgical Procedure

Author [redacted]

ROBERTA LYNN STEVENSON

Sept. 20, 1991
Date