Survey of Nurses' Understanding Relative to the Prevention of Contractures

Dorothy Spady

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SURVEY OF NURSES' UNDERSTANDING RELATIVE TO THE PREVENTION OF CONTRACTURES

by

Dorothy Spady

A Thesis in Partial Fulfillment of the Requirements for the Degree Master of Science in the Field of Nursing

June, 1964
I certify that I have read this thesis and that in my opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science.

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ACKNOWLEDGEMENTS

Grateful acknowledgement is made to those whose assistance made this study possible. I am especially indebted to Miss Joan Sommer, Chairman of the Thesis Committee, Miss Anabelle Mills, and Dr. Vernon Nickle for their interest, encouragement and guidance in the development of this study.

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To the nursing personnel who willingly participated in this survey, I wish to express gratitude.

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Dorothy Spady
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. INTRODUCTION TO THE PROBLEM</td>
<td>1</td>
</tr>
<tr>
<td>Interpretation of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>Statement of the Problem</td>
<td>1</td>
</tr>
<tr>
<td>Need for the Study</td>
<td>1</td>
</tr>
<tr>
<td>Purpose of the Study</td>
<td>2</td>
</tr>
<tr>
<td>Hypothesis</td>
<td>3</td>
</tr>
<tr>
<td>Assumptions</td>
<td>3</td>
</tr>
<tr>
<td>Limitations</td>
<td>3</td>
</tr>
<tr>
<td>Definition of Terms</td>
<td>4</td>
</tr>
<tr>
<td>Method of Study</td>
<td>4</td>
</tr>
<tr>
<td>II. OVERVIEW OF LITERATURE</td>
<td>6</td>
</tr>
<tr>
<td>Introduction</td>
<td>6</td>
</tr>
<tr>
<td>Historical Background</td>
<td>6</td>
</tr>
<tr>
<td>Definition of Contracture</td>
<td>7</td>
</tr>
<tr>
<td>Etiology of Contracture</td>
<td>8</td>
</tr>
<tr>
<td>Immobilization</td>
<td>8</td>
</tr>
<tr>
<td>Underlying Factor of Pain</td>
<td>9</td>
</tr>
<tr>
<td>Pathology and Pathogenesis</td>
<td>9</td>
</tr>
<tr>
<td>Prevention of Contractures</td>
<td>11</td>
</tr>
<tr>
<td>Exercise</td>
<td>12</td>
</tr>
<tr>
<td>Range of Motion</td>
<td>13</td>
</tr>
<tr>
<td>Positioning</td>
<td>14</td>
</tr>
<tr>
<td>CHAPTER</td>
<td>PAGE</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
</tr>
<tr>
<td>The Nurse's Role in Prevention</td>
<td>18</td>
</tr>
<tr>
<td>The Nurse's Responsibility in Giving Range of Motion</td>
<td>20</td>
</tr>
<tr>
<td>The Nurse's Understanding of Contractures</td>
<td>21</td>
</tr>
<tr>
<td>The Nurse as a Teacher</td>
<td>23</td>
</tr>
<tr>
<td>Summary</td>
<td>24</td>
</tr>
<tr>
<td>III. METHODOLOGY</td>
<td>25</td>
</tr>
<tr>
<td>Development of the Tool</td>
<td>26</td>
</tr>
<tr>
<td>Tool Selected</td>
<td>26</td>
</tr>
<tr>
<td>The Pilot Study</td>
<td>26</td>
</tr>
<tr>
<td>Sampling Method</td>
<td>27</td>
</tr>
<tr>
<td>Hospitals Participating</td>
<td>27</td>
</tr>
<tr>
<td>Obtaining Permission</td>
<td>27</td>
</tr>
<tr>
<td>Selection of the Respondents</td>
<td>28</td>
</tr>
<tr>
<td>Collection of the Data</td>
<td>28</td>
</tr>
<tr>
<td>The Procedure Used</td>
<td>28</td>
</tr>
<tr>
<td>Questionnaire Content</td>
<td>29</td>
</tr>
<tr>
<td>Coordination of Data</td>
<td>30</td>
</tr>
<tr>
<td>Summary</td>
<td>30</td>
</tr>
<tr>
<td>IV. ANALYSIS AND INTERPRETATION OF THE DATA</td>
<td>31</td>
</tr>
<tr>
<td>Classification of Data</td>
<td>31</td>
</tr>
<tr>
<td>Introductory Questions</td>
<td>32</td>
</tr>
<tr>
<td>Professional or Vocational Preparation</td>
<td>32</td>
</tr>
<tr>
<td>Summary</td>
<td>38</td>
</tr>
<tr>
<td>Definition and Etiology of Contracture</td>
<td>38</td>
</tr>
<tr>
<td>Summary</td>
<td>41</td>
</tr>
<tr>
<td>CHAPTER</td>
<td>PAGE</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Prevention of Contractures</td>
<td>43</td>
</tr>
<tr>
<td>Methods of Prevention</td>
<td>43</td>
</tr>
<tr>
<td>Summary</td>
<td>46</td>
</tr>
<tr>
<td>Range of Motion</td>
<td>48</td>
</tr>
<tr>
<td>Summary</td>
<td>54</td>
</tr>
<tr>
<td>Positioning</td>
<td>54</td>
</tr>
<tr>
<td>Summary</td>
<td>56</td>
</tr>
<tr>
<td>Preventive Methods for Specific Conditions</td>
<td>57</td>
</tr>
<tr>
<td>Summary</td>
<td>57</td>
</tr>
<tr>
<td>Equipment Used by the Nurse to Prevent Contractures</td>
<td>59</td>
</tr>
<tr>
<td>Teaching Aspects</td>
<td>59</td>
</tr>
<tr>
<td>Summary</td>
<td>61</td>
</tr>
<tr>
<td>V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS</td>
<td>65</td>
</tr>
<tr>
<td>Summary</td>
<td>65</td>
</tr>
<tr>
<td>Conclusions</td>
<td>68</td>
</tr>
<tr>
<td>Recommendations</td>
<td>69</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>70</td>
</tr>
<tr>
<td>APPENDIX</td>
<td>75</td>
</tr>
</tbody>
</table>
LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Length of Time that Respondents Had Been Giving Nursing Care to Patients</td>
<td>33</td>
</tr>
<tr>
<td>II. Educational Preparation of Respondents for Bedside Nursing</td>
<td>34</td>
</tr>
<tr>
<td>III. How Total Respondents Received Instruction at Hospital of Current Employment</td>
<td>36</td>
</tr>
<tr>
<td>IV. Specific Information Respondents Learned at Hospital of Current Employment</td>
<td>37</td>
</tr>
<tr>
<td>V. Factors Indicated by Respondents which Favor the Development of Footdrop</td>
<td>40</td>
</tr>
<tr>
<td>VI. Type of Patient Most Likely to Develop a Contracture as Indicated by Respondents</td>
<td>42</td>
</tr>
<tr>
<td>VII. Body Areas Most Frequently Checked by Respondents for Contracture Development</td>
<td>45</td>
</tr>
<tr>
<td>VIII. Method Respondents Indicated as Most Effective in Preventing Contractures</td>
<td>47</td>
</tr>
<tr>
<td>IX. Body Joints Most Frequently Given Range of Motion by Respondents</td>
<td>49</td>
</tr>
<tr>
<td>X. How Often Respondents Are Giving Range of Motion to Patients on Bedrest</td>
<td>51</td>
</tr>
<tr>
<td>XI. Points Respondents Considered When Giving Range of Motion</td>
<td>53</td>
</tr>
<tr>
<td>XII. Respondents' Indication as to When Range of Motion Should be Begun on Patients with a Cerebral Vascular Accident</td>
<td>58</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION TO THE PROBLEM

The prevention of contractures and resulting physical deformity is included as one of the basic elements of effective nursing care. In planning this type of care, the bedside nurse, who is the most logical person to administer the basic measures of contracture prevention, must utilize her fund of basic knowledge, together with various skills and resources in order to carry out or direct the actual steps of prevention indicated. By incorporating preventive techniques into routine nursing care procedures, along with or immediately following the intensive life-saving measures, confinement will be shortened, hospital costs reduced, and the patient returned more quickly to independence.¹

I. INTERPRETATION OF THE PROBLEM

Statement of the Problem

The problem considered in this study was to find out what understanding the bedside nurse has relative to the prevention of contractures.

Need for the Study

This study was needed to discover the nurse's knowledge in regard to the principles of contracture prevention. In recent years numerous articles have been written by registered nurses on rehabilitation.

Physicians and registered nurses alike consider the prevention of contractures by nursing care to be of paramount importance and primarily the function of nurses. The recovery of patients is still being clouded by the pain and deformity of contractures. Fewer registered nurses and more vocational nurses and nursing attendants are giving bedside care. These auxiliary nurses can be taught the positive physical approach to the prevention of contractures that is proper and essential for nursing personnel. The information obtained from this study could be used as a guide in planning the inservice education program within the hospital, thus improving the nursing care given to patients and lessening the incidence of the serious, crippling effects of contractures. Nickel, Chief of Surgical Services and Head Orthopaedist at Rancho Los Amigos Hospital, suggested that nurses, responsible for nursing care, can halt the progression of contractures and resulting deformity by a more complete understanding and practice of the basic principles of prevention.²

Purpose of the Study

The immediate purpose of this study was to determine the nurse's fund of basic knowledge in regard to the principles involved in the prevention of contractures. By studying what the bedside nurses said they did to prevent contractures, an attempt was made to ascertain their understanding of the principles of prevention. The long-range purpose of improved inservice education would be beneficial in helping nurses become aware of and participate in his or her role as a member of the health

²Statement by Vernon L. Nickel, Chief of Surgical Services at Rancho Los Amigos Hospital and Clinical Professor of Orthopaedic Surgery, Loma Linda University.
team in preventing contractures.

**Hypothesis**

There is a lack of knowledge on the part of the bedside nurse of the procedures necessary to prevent contractures and of nursing's significant role in this prevention.

**Assumptions**

1. It was assumed that nursing personnel were able to communicate what they knew about contractures.

2. It was assumed that nursing personnel chosen from four hospitals were typical of those in the area.

**Limitations**

This study was limited as follows:

1. A group of fifty nurses, selected at random, were questioned.

2. The knowledge of nursing personnel regarding contractures and their prevention was obtained by questionnaire.

3. Nurses were selected from four hospitals within the Inland Empire of Southern California.

4. The nurses questioned were chosen from medical, surgical, and orthopaedic units.

5. The items on the questionnaire pertained to the most common preventable contractures, namely:
   
   a. Adduction and flexion of the shoulder

---

3Statement by Lucy V. McDaniels, Ed. D., R.P.T., Rancho Los Amigos Hospital.
b. Flexion of the elbow

c. Flexion or extension of the fingers

d. Adduction, extension, and flexion of the thumb

e. Flexion, adduction, and external rotation of the hip

f. Flexion of the knee

g. Plantar flexion of the foot

II. DEFINITION OF TERMS

For the purpose of this study the following terms were defined:

1. Nurse, bedside nurse, and nursing personnel - any individual giving nursing care directly to the patient, irrespective of educational background.

2. Contracture - a shortening of muscle and soft tissue around the joint, limiting the normal range of joint motion.

3. Range of motion - the movement of a joint through its full, normal range of motion without causing discomfort that persists more than a few minutes.

4. Contractural Deformity - an acquired distortion of a joint limiting its normal range of motion due to a shortening of muscle and soft tissue surrounding the joint.

III. METHOD OF STUDY

A descriptive-survey study was done, using a questionnaire as the data-gathering tool. A total of fifty bedside nurses, irrespective of their educational preparation for nursing care, were questioned. The individuals questioned were chosen at random from the medical, surgical, and orthopaedic units of four hospitals, namely, Loma Linda University
Hospital, Riverside County General Hospital, St. Bernadine's Hospital, and the Riverside Community Hospital. A pilot study was conducted. The data obtained by the questionnaire were classified, analyzed, and interpreted. Conclusions were drawn and findings and recommendations for further study made.

A review of literature was made prior to this study in order to clearly define the principles of contracture prevention and the nurse's role in prevention. This information, plus material received by personal interviews with experts in the field, served as a guide in selecting questions to be included in the questionnaire.
CHAPTER II

OVERVIEW OF LITERATURE

I. INTRODUCTION

A review of literature was made to define contracture and the associated etiology and pathogenesis. Only the preventive aspects of treatment were reviewed in order to establish the principles to be utilized in the prevention of contractures and to clearly define the bedside nurse's role in using these principles.

II. HISTORICAL BACKGROUND

Hippocrates, who as early as 400 B.C., wrote descriptions of various medical and surgical techniques that were distinctly rehabilitative in character, thus spoke, "Exercise strengthens and inactivity wastes."4

By 1881 Richet defined and described clinical contracture, and in 1884 mobilization and correct positioning, the principles of prevention still applicable today, were described. In 1917, following a review of the subject, Cooper, in his discussion of treatment, stressed prevention.5

The understanding of the phenomenon of contractures has not

4Sister Mary Mercita, "Rehabilitation - Bridge to a Useful and Happy Life," Nursing Outlook, 10:581, September, 1962.

increased significantly since Richet's report, which may be due to the attitude which until recently has prevailed concerning chronic disease. For too long the complication of contracture has been received as inevitable, to be accepted stoically without hope for prevention or relief. Following World War II, medical literature has provided considerable space to the abuse and hazards of bedrest, and practitioners have developed a more positive approach to the complications of chronic illness. Sir Robert Jones once said:

'It can never be realized too widely that deformity is an unnatural and preventable affliction, which treatment may alleviate or cure, but which a more complete understanding could abolish.'

III. DEFINITION OF CONTRACTURE

The term contracture is generally misunderstood because of similar terms that are used in describing normal muscle physiology. Contraction and contracture are normal muscle phenomena, but the term contracture, as associated with deformity, is a pathological state and the inability of muscle, fascia, ligaments, tendons, skin and other soft tissue surrounding the joint to return to its normal, anatomical position after being maintained in a shortened position for varying periods of time.

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6Ibid.
8Lowenthal, loc. cit.
Manipulation of this immobilized joint would result in tissue damage or tearing. A true contracture, according to Lowenthal and Tobis, cannot be altered under deep anesthesia.\textsuperscript{11} A deformity or malformation of a body part is the result of this permanent or semi-permanent shortening of tissue.

IV. ETIOLOGY OF CONTRACTURE

Contractures do not occur haphazardly, but have a certain regularity and consistency in their development which indicates that they are governed by certain biological laws and it is probable that these laws are vested in the physical properties of the muscle itself.\textsuperscript{12}

Lowenthal states: "Immobilization and the undetermined contribution of factors such as pain and personality are the underlying causes for the development of contractures."\textsuperscript{13}

Immobilization

It is a generally accepted fact that fixation of a joint with consequent immobilization of the related muscles is the basis for the development of all contractures. There is no agreement, however, as to the extent or duration of fixation which will lead to a contractural deformity.\textsuperscript{14}

\begin{itemize}
\item \textsuperscript{11}Lowenthal, op. cit., p. 641.
\item \textsuperscript{13}Lowenthal, op. cit., p. 645.
\item \textsuperscript{14}Ibid., p. 641.
\end{itemize}
Inactivity or prolonged immobilization in one position may be due to the following causes: (1) paralysis, (2) enforced rest, (3) immobilization by braces, casts or traction, (4) pain, (5) mental disorders, and (6) sensory loss in a localized part.\textsuperscript{15}

**Underlying Factor of Pain**

Although immobilization is the most important causal factor in the development of contractures, pain also plays a role,\textsuperscript{16} as immobilization is often a necessary expedient for the relief of pain. Stiffness of the part is not a desirable end result of immobilization. Immobilizing the part is a form of giving in to the pain and should be considered as a temporary measure, unless some serious damage has been done that requires continued immobilization.\textsuperscript{17} Pain contributes to the increased tonus present in upper motor neuron disease and acts as a stimulus to increase spasticity.\textsuperscript{18}

**V. PATHOLOGY AND PATHOGENESIS**

There is no definite description of the pathological changes that take place in muscle, tendons, ligaments, fascia and skin surrounding a joint following periods of immobilization in man. Many studies have been conducted in regard to experimental joint immobilization in animals.

\textsuperscript{15}Rehabilitation Nursing, X 449 AB, June, 1961, p. 11-1.

\textsuperscript{16}Lowenthal, \textit{loc. cit.}

\textsuperscript{17}Henry O. Kendall and others, Posture and Pain (Baltimore: Williams and Wilkins Company, 1952), p. 184.

\textsuperscript{18}Lowenthal, \textit{loc. cit.}
Evans, in studying the effects of immobilization on the knee joint of the rat, concluded that contracture of both the muscles and the capsule following prolonged periods of immobilization is responsible for restriction of motion, the primary fault being the shortening of muscles. "Proliferation of intracapsular connective tissue and the formation of adhesions are primary responses to limitation of motion."20

The pathogenesis of contractural deformity is not commonly understood and there are varying opinions as to the role that the contractile mechanism of muscle and the joint capsule and ligaments play in contracture development.

Changes seen in skeletal muscle on gross examination following a surgical correction of a contracture shows atrophy, with the muscle being replaced by fibrotic tissue and fat.21

The histologic changes of atrophy consist of progressive shrinkage of muscle cells by resorption of sarcoplasm and fibrous replacement of collapsed sarcolemmal sheaths in the late stages.22

Disuse atrophy results when tissue function is decreased or when it ceases to function. A certain amount of functional activity is apparently necessary for the life of the cell. There is a decreased blood supply along with decreased function, which is a secondary phenomenon. Following immobilization the tissue diminishes in size and strength and

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21Allen Webb, Pathologist, Rancho Los Amigos Hospital.

the proportion of muscle fiber and connective tissue changes so there is
more fibrous tissue and less muscle mass. 23

VI. PREVENTION OF CONTRACTURES

Although the causes of disability vary, those disabled by disease
may develop similar complications. A complication such as a contracture
contributes to pain, limits the goals of rehabilitation, distracts from
the patient's appearance, and limits possibilities of self-care and ambu-
lation, 24 thus every effort should be made to prevent this deformity and
the resulting helplessness.

Deformities are likely to occur under varying conditions in any
age group, 25 and while the patient's comfort is of utmost importance, so,
too, is the need to prevent deformity. 26

The first goal of contracture therapy is prevention and early de-
tection. Although further understanding of the pathogenesis is to be
expected through studies, sufficient clinical knowledge exists to prevent
this distressing disability. If all those responsible for the care of
patients could become acquainted with the simple techniques for the pre-
vention of contractures, this complication could be virtually elimi-
nated. 27

23 E. T. Bell. A Text Book of Pathology (Philadelphia: Lea and

24 Rehabilitation Nursing Techniques, #1, Bed Positioning and Trans-
er Procedures for the Hemiplegic (Minnesota: Minnesota Department of

25 "Prevention of Deformity," Nursing Times, 58:1232, September,
1962.

26 Ibid., p. 1234.

27 Lowenthal, op. cit., p. 645.
The proper treatment of contractures, which is prevention, can be accomplished by exercise, range of motion, and correct positioning.  

**Exercise**

Exercises, or joint motion, are given for the following purposes: (1) to retain movements in joints and normal tone in the muscles controlling them, thus preventing stiffness, (2) to restore movements which have been lost due to disuse, injury or disease, (3) to redevelop muscles so that joint movement is controlled, and (4) to restore muscle balance.  

The types of motion employed for remedial exercise may be classified as follows:

1. **Active exercise** - exercise performed by the patient without assistance.

2. **Passive exercise** - exercise in which the patient neither assists or resists as someone else carries a body part through its range of free motion.

3. **Assistive exercise** - exercise in which the patient attempts to help as the part is moved by someone.

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31 Ibid.
4. Resistive exercise - exercise in which the patient's performance of a given movement is opposed by the application of a counter pressure.32

In 1955, Chow and colleagues at Western Reserve University did some research in which they studied the role of the nurse in giving passive exercise, or range of motion, as they preferred to call it. In this study, passive exercise was defined as follows:

Passive exercises are non-forced and painless movements performed by another individual. These movements involve taking a body segment through its free range of joint motion.33

Range of Motion

The terms passive exercise and range of motion are commonly used interchangeably, but range of motion describes the extent of joint motion. It involves taking a body part through its full, normal range of motion and can be done by someone else or the patient himself. It is given to maintain the maximum full range of free movement within the joint.

Normal joint motion through a full arc requires that the joint and its capsule be healthy and that the muscles producing or influencing the movements be of adequate strength as well as coordinated in their action. In pathologies these conditions are frequently not present, and the joint becomes restricted in its function.34

Moving a joint passively through full range of motion, or as far as it can be moved without causing discomfort which lasts more than a few

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32Ibid.

33Rita Chow and others, The Role of the Nurse in the Administration of Passive Exercise (Western Reserve University: Frances Payne Bolton School of Nursing, 1955), p. 20.

34Knocke, op. cit., p. 527.
minutes, is an important preventive measure and simple enough to be
carried out by a nurse after instruction and practice. Range of motion
can be taught to an attendant or to the family who will give care in the
home.  

Range of motion early in the illness is a must for preventing
deformity. If contractures develop during the illness, the patient can-
not use the muscle power when it returns; nor can braces and artificial
limbs be applied. Much professional time, plus the patient's time and
money, are spent correcting deformity that occurs needlessly.

The patient should do the range of motion as soon as possible
without help, but with supervision. When the joint movements are given
by another, deformities are prevented but the patient does not gain
strength. If loss of joint motion already exists, range of motion helps
to prevent further loss of motion.

It has been empirically observed that if range of motion is done
daily, contractures will not develop.

Positioning

Many failures in prevention of contractures are due to inadequate
maintenance of correct position, or bed posture. Kendall defines

35 Allgire, op. cit., p. 28.
36 Ibid.
37 Ibid., p. 29.
38 Lowenthal, op. cit., p. 643.
posture as a relative arrangement of the parts of the body, basically a matter of skeletal alignment. Good body alignment is that state of muscular and skeletal balance which protects the supporting structures of the body against injury or progressive deformity irrespective of the attitude in which these structures are working or resting. Poor alignment is a faulty relationship of the various body parts which produce increased strain on the supporting structures producing a less efficient balance of the body over its base of support.\textsuperscript{40}

Correct bed posture promotes comfort and helps prevent deformity. Relief is found from discomfort and restlessness by bending joints, and when joints are kept in bent positions deformities occur.\textsuperscript{41} Larson and Gould state:

> Every two weeks of bed rest in faulty positions may be sufficient to bring about contractures of important muscle groups. When a joint is held in a certain position without change for such a period of time, it has the tendency to stay in that position.\textsuperscript{42}

> Every patient should have a change of position every two hours unless it is not permitted by the physician. This frequent change of position is especially important for the paralyzed, unconscious and very weak patients, as they are most likely to develop complications, such as chest congestion, bedsores, and contractures from lying too long in one position.\textsuperscript{43} Changing the patient's position also helps to put his joints through range of motion.\textsuperscript{44}

\textsuperscript{40}Kendall, op. cit., p. 5.
\textsuperscript{41}Allgire, op. cit., p. 26.
\textsuperscript{42}Larson and Gould, op. cit., p. 33.
\textsuperscript{43}Ibid.
\textsuperscript{44}Rehabilitation Nursing Techniques, No. 1, op. cit., p. 9.
Three fundamental, functional positions that can be used in the care of bed patients, provided positions are alternated frequently, are the prone, supine, and sidelying positions.

The supine or backlying position distributes the entire posterior surface of the body and in this way establishes as nearly as possible the same posture as when standing, which is full extension. The body is aligned horizontally with the center of gravity of the head, arms, and trunk in a plane slightly behind the hip joints.

While in the supine position, a thin pillow under the head or neck permits easier breathing and prevents round shoulders. A paralyzed arm should rest at the patient's side with support under the forearm and hand. Sandbags placed along the outside of the thigh prevent external rotation of the thigh when hip and leg are weak or paralyzed. Large rolls or pillows under the knees often cause knee flexion deformities. The feet should be placed against a foot board with toes pointed toward the ceiling, since the bed patient has a tendency to develop plantar flexion or footdrop. This flexion is due to the pull of gravity, the weight of the bedclothes, the weakness of the dorsiflexors, or any combination of these factors.

The sidelying position aids circulation of skin and muscles of the back and is restful to the patient. Every patient should spend part

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45 Ibid.
46 Ibid., p. 5.
47 Alligre, loc. cit.
48 Ibid., p. 27.
49 Knocke, op. cit., p. 238.
of the time on alternate sides when his condition permits. 50 While in this position, comfort demands that one hip and knee be flexed. A large pillow is placed between the legs when the patient is in this position to support the uppermost leg. 51

As in the supine position, the prone position distributes the entire body weight and as nearly as possible establishes the same posture as when standing, thus helping to prevent hip flexion contractures. When the physician approves, the patient should be placed in the prone position for thirty minutes, two or three times daily as tolerated. Those tolerating this well should be encouraged to sleep in the prone position part of the night. 52

In the prone position a pillow is seldom used under the head, but, because the shoulders have a tendency to slump forward in this position, they should be supported on small pads or rolled towels. A small pillow may also be used under the abdomen. In this position the feet are allowed to drop over the edge of the mattress, thus protecting the toes, with the feet in dorsiflexion and the knees extended. 53

In alternating positions it is important that positions are provided which are truly alternate as far as the individual joint positions are concerned. 54 The patient should not be allowed to remain in the semi-sitting position for prolonged periods of time. If it is necessary that

50Allgire, loc. cit.
51Knocke, op. cit., p. 243.
52Rehabilitation Nursing Techniques No. 1, op. cit., p. 9.
54Ibid., p. 245.
the head of the bed remain elevated most of the time, this may be done with shock blocks or bed elevators, as this provides elevation of the head of the bed without hip and knee flexion.55

VII. THE NURSE'S ROLE IN PREVENTION

Promoting the total well-being of the human body as it is governed by the structure and function of the musculo-skeletal system is a fundamental aspect of nursing. The underlying principles promoting this type of well-being are universal. They apply to healthy individuals as well as to patients who have made the necessary adaptations to the diseased conditions.56

The prevention of deformity and helplessness by range of motion and positioning should be primarily the function of nurses,57 although this concept is not generally accepted by doctors and physical therapists. The nurse is the most logical person to begin and continue restorative care, as she works more closely with the patient.58

Pierson states:

Nurses are in an advantageous position to make a distinct contribution to physical medicine, provided there can be developed in them an awareness of its practical value and wide application in promoting the comfort and contentment of their patients.

A knowledge of body mechanics as applied to herself and

56Fash, op. cit., p. vii.
58"Rehabilitation Starts in the Hospital Bed," Modern Hospital, 97:98, May, 1962.
the acquisition of habitual good posture develop in a nurse
an awareness of these factors as they apply to all phases of
nursing care. 59

Many contractures can and must be prevented, and in doing this it
is proper and essential for nurses to position patients in normal body
alignment and to administer and encourage range of motion. 60

Nursing care that will prevent deformity and helplessness
requires no written order or permission of the physician.
It should be done routinely and consistently provided by
all nursing personnel at all times. 61

Although the affected part is the responsibility of the doctor,
the unaffected part is the responsibility of the nurse and it is not
dangerous for a nurse to give range of motion exercise to the point of
tenderness and pain. 62

The positive physical approach to the prevention of contractures,
if carried out faithfully, is more effective and less expensive than
machines and water baths. There is no medical contraindication to range
of motion and a daily administration is usually adequate, although
people have different tendencies toward contracture formation. 63

Rehabilitation is facilitated during the acute and early con-
valescent stages by good nursing care. The tendency to become so con-
cerned with the acute aspects of the patient's disease or injury means
failure to emphasize sufficiently the preventive aspects, 64 which must be

59Fash, op. cit., p. 33.
60Statement by Nickel.
61Madden and Affeldt, loc. cit.
62Statement by Ruth Wagner, R. N., Rancho Los Amigos Hospital.
63Statement by Nickel.
64Geraldine Skinner, "The Nurse - Key Figure in Preventive and
considered the minute the patient gets sick or enters the hospital.\textsuperscript{65}

For example, range of motion should be started twenty-four hours after the onset of a cerebral vascular accident.\textsuperscript{66} Therefore, in each patient the nurse must recognize a challenge and perform her role in helping to prevent deformity from developing.

In the past, importance has been given to rehabilitation in the later phases of care, resulting in the initiation of restorative measures long after the onset of the illness or injury. Such delays frequently result in complete or partial loss of joint motion, shortening and wasting of muscles, and general loss of strength, resulting in invalidism. As soon as the diagnosis is made, the nurse may start the preventive techniques of rehabilitation.

When deformities and other complications are prevented and the patient is keeping his strength through early activities, the confinement will be shorter, the cost less and the patient will return more quickly to independence.\textsuperscript{67}

\textbf{Nurse's Responsibility in Giving Range of Motion}

The normal range of movement in a joint and in a muscle is maintained by active movement. If the patient is unable to move or able to move only in one direction, tightness and contracture result. Tightness and contracture can be prevented in most cases by giving range of motion regularly and by careful positioning.\textsuperscript{68}

\textsuperscript{65}Ibid., p. 56.

\textsuperscript{66}Statement by Nickel.

\textsuperscript{67}Allgire and Denney, \textit{op. cit.}, p. 19.

Chow's study outlines the following safeguards for giving range of motion:

1. In order to insure the patient's cooperation and relaxation of the extremity, an explanation must always be given.
2. The nurse must have an understanding of the terminology used in describing joint motion.
3. The extremity should be lifted carefully, adequately supporting the joint.
4. All movements must be made within the free range and within normal planes of joint motion.
5. All movements must be made gently and slowly.
6. Movements should not be forced.
7. After completion of the treatment the part should be placed in good body alignment.\(^6^9\)

Some additional points to be considered in giving range of motion, as stated by Martin-Jones, are:

1. In order to appreciate the abnormal the nurse should be familiar with the normal range of motion.
2. The movement should be given three times in each direction.
3. Increase of pain or decreased movement should be reported.\(^7^0\)

The Nurse's Understanding of Contractures

A better understanding of the reasons for performing routine tasks makes the work more interesting and increases the likelihood that details

\(^{6^9}\)Chow, *op. cit.*, p. 50.

\(^{7^0}\)Martin-Jones, *loc. cit.*
will be attended to, resulting in better nursing care of the patient. Proper attention to details at the onset of illness can prevent such complications as contractural deformity, which can result in more serious obstacles than the original disease.\(^{71}\)

Because much crippling can be prevented by nursing care, it is important that the nurse have sufficient knowledge about contractures, their etiology and prevention. She should be aware that the tendency to develop many types of deformity is increased in neuromuscular disorders, arthritis, amputations, patients in traction and casts, the aged, in patients with long-term illness\(^{72}\) and burns.\(^{73}\)

The techniques that foster contractures are tempting ones, such as a pillow under the knee and the Gatch bed. No patient who is going to be in bed for more than three hours should be pampered with a pillow under the knees, as contractures of the hip and knee are a certain result. The Gatch bed should never be used for long-term patients. Lying flat, however uncomfortable, is better in the long run than a semi-sitting or sitting position.\(^{74}\)

Contractures cannot be prevented entirely, even by the best care, as some diseases with gross pathological destruction of tissue work their will in spite of everything.\(^{75}\) The most common, preventable contractures

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\(^{72}\) Knucke, op. cit., p. 241.


\(^{75}\) Ibid., p. 79.
are (1) adduction and flexion of the shoulder, (2) flexion of the elbow, (3) flexion or extension of the fingers, (4) adduction, extension, and flexion of the thumb, (5) flexion, adduction, and external rotation of the hip, (6) flexion of the knee, and (7) plantar flexion of the foot.\footnote{Statement by McDaniels.}

Although some contractures cannot be prevented, still most contractures can be prevented by proper care and nurses have the great responsibility of giving that care.\footnote{Allgire, \textit{op. cit.}, p. 25-27.}

Some additional procedures that the nurse can use to prevent contractures are as follows:

1. Firm mattress supporting the entire body on one plane.
2. Bedboards, giving additional support and firmness.
3. Footcradle to keep the weight of the blankets off the feet.
4. Overhead bar which is helpful in changing positions and turning.

\textbf{The Nurse As a Teacher}

The nurse can help the patient to prevent contractures by teaching him what good body alignment is and how it can be maintained in all positions.\footnote{Kathleen Shafer and others, \textit{Medical-Surgical Nursing} (St. Louis: The C. V. Mosby Company, 1958), p. 57.} The daily bath affords an excellent time, not only to teach the patient the importance of exercise and frequent position change, but to place each joint through its normal range of motion if the patient is not able to do it himself.

Range of motion and procedures used by the nurse to prevent
contractures may be taught to the family who will be giving care in the home. 79

Another nursing responsibility is to help patients to become self-sufficient despite limitations, as teaching and encouraging self-help is an integral part of good nursing care. Exercise can be encouraged through activities such as combing hair, feeding self and washing hands and face. 80

VIII. SUMMARY

A review of medical, physical therapy and nursing literature was made concerning contractures and the nurse's role in prevention. The term contracture, as associated with deformity, is a pathological state and the inability of muscle and the soft tissue surrounding a joint to return to its normal position after being immobilized in a shortened position for varying periods of time. This shortening results in deformity. Immobilization and the contributing factor of pain are the cause of contracture development. The pathology and pathogenesis of contracture in man is not commonly understood. Pathological changes seen on gross examination show atrophy and fibrosis. Many contractures can be prevented by range of motion, exercise, proper positioning and other types of mobilization. The nurse has a responsibility in preventing contractual deformity and helplessness by being aware of the procedures that she can utilize in preventing contractures and by carrying out these preventive aspects of rehabilitation routinely at the bedside during the entire hospital stay.

79Statement by Ruth Wagner.

80Knocks, op. cit., p. 247.
CHAPTER III.

METHODOLOGY

The purpose of this study was to find out the knowledge nursing personnel have relative to contractures and nursing procedures utilized in preventing contractural deformity.

The descriptive-survey was the method chosen to provide data for the study. The word description, as defined by Good and Scates, "includes induction, analysis, classification, enumeration, measurement and evaluation. The word survey indicates the gathering of data regarding current conditions."81 Descriptive-survey research is directed toward finding the facts that prevail in a group of cases chosen for study and is essentially a technique of quantitative description of the general characteristics of the group.82

Literature was reviewed in the fields of medicine, rehabilitation, nursing and physical therapy in order to identify the principles of contracture prevention and the nurse's role in prevention. The information obtained from this review, plus personal interviews with specialists in the field, served as a background of knowledge necessary in developing the tool used in collecting the desired data.


82 Ibid., p. 551.
I. DEVELOPMENT OF THE TOOL

Tool Selected

A questionnaire was devised to obtain the knowledge of nursing personnel pertinent to the study. The questionnaire is probably the most used of the data-gathering devices and may serve, if properly constructed and administered, as a most appropriate and useful data-gathering tool.

Thirty questions were formulated, using the background of knowledge gained regarding contractures from literature and experts in the field. These questions were of both the true-false and multiple choice type, dealing with contractures and the preventive aspects of positioning and mobilization.

As suggested by Haberland, questions number one through thirty were randomized so that each item would appear entirely independent of the other. Questions number thirty-one through thirty-three were of the open-end type, providing the respondent an opportunity to give information regarding his or her professional or vocational preparation for nursing. These three questions, which may have been interpreted as personal, were purposely placed at the end of the questionnaire preceded by questions creating a more favorable attitude.

The Pilot Study

A pilot study was conducted to acquaint the researcher with the

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83 See Appendix A.
administration of the questionnaire, to determine the length of time necessary in answering the questions, and to find out whether the questions were understood without additional explanation.

Following this miniature study, in which ten nurses, including registered nurses, students of nursing, and a licensed vocational nurse were asked to respond, several refinements were made in the questionnaire.

The data collected in the pilot study were not used in the final study.

II. SAMPLING METHOD

To obtain information concerning the knowledge of nursing personnel relative to contracture prevention, those giving patient care were questioned, irrespective of educational background.

Hospitals Participating

A total of fifty nursing personnel from four hospitals in the Inland Empire of Southern California participated in the study. These general hospitals were used in order to obtain a greater variety of nursing personnel.

Obtaining Permission

The directors of nursing service of the four selected hospitals were contacted personally for permission to question nursing personnel employed in their hospitals. The purpose of the study was explained. A letter of explanation requesting consent was presented at the time of the interview. It was requested that nursing personnel on the medical, surgical, and orthopedic units be informed that a survey was to be conducted, but the nature of the survey was not to be disclosed.
Selection of the Respondents

Nursing personnel giving direct patient care on medical, surgical, and orthopedic units of four hospitals were selected for the study. This group included nurses giving direct patient care on all three shifts.

Individual participants from three hospitals were chosen by unsystematic random sampling. This random sample was obtained by placing the name of each nurse, scheduled during a twenty-four hour period, to give direct nursing care, on a slip of paper. A pre-determined number of slips, twelve from two hospitals and thirteen from two hospitals, were then chosen from the container. It was necessary to make some substitution due to the availability of the nurse chosen.

Respondents from the fourth hospital were chosen by the director of nursing service, with the researcher, selecting a variety of names, including nursing attendants, registered nurses, and licensed vocational nurses from those scheduled during a specified twenty-four hour period. The director stated that her selection was free from bias and motivated by a desire to be of assistance to the researcher.

After selection of the participants, arrangements were made with the directors and supervisory staffs to meet with the respondents at a time most convenient for them during their shift. An effort was made to comply with the requests of each unit, so that patient care would not be interrupted or delayed.

III. COLLECTION OF THE DATA

The Procedure Used

Tentative appointment hours for administering the questionnaires were set with the approval of the director, supervisors, and head nurses
on the units. At this pre-determined time, nursing personnel were approached and asked to participate in a study regarding the nurse's role in preventing contractures. The nurses were assured that neither the hospital nor their work was being evaluated and their names would remain anonymous.

In three hospitals the inquiries were conducted on the unit, in conference and treatment rooms. In the fourth hospital, the inservice director, as requested by the director of nursing service, called the units and asked that the respondents chosen be sent to her office. Rapport between the respondent and the researcher was established by an introduction followed by an explanation as to the purpose of the survey. Respondents were informed that the survey consisted chiefly of questions concerning contractures and ways in which nurses can prevent them. Nursing personnel were then asked if they would be willing to donate approximately ten or fifteen minutes of their time to filling out the questionnaire. After the questionnaire was explained, respondents were asked to circle the appropriate answer or answers and informed that the researcher would be available to clarify questions as needed.

The questionnaires were given to individuals singly or to groups of from two to four respondents, each answering independently. Each respondent chosen was willing to cooperate in the survey, although several seemed threatened by the questions and had to be reassured as to the purpose of the survey.

**Questionnaire Content**

Three introductory questions included the name of the hospital, the unit on which the respondent was employed, and the position held.
The body of the questionnaire was based on the principles of functional
positioning and mobilization utilized by the nurse to prevent contractures.
To provide data about the nurse's professional or vocational preparation
for nursing, three open-end type questions were included.

**Coordination of Data**

The data obtained by the questionnaire were classified, tabulated,
analyzed, and interpreted. Tables were prepared, findings summarized,
and recommendations made.

**IV. SUMMARY**

A combined closed and open-end type of questionnaire was used to
study the knowledge of nursing personnel relative to contracture preven-
tion. Questions were formulated after literature was reviewed and ex-
erts in the field were interviewed. A pilot study was conducted, which
resulted in refinement of the questionnaire. Fifty nurses, from four
hospitals, giving direct care to patients and chosen by unsystematic ran-
dom participated in a survey by answering questions pertaining to con-
tractures and their prevention.
CHAPTER IV.

ANALYSIS AND INTERPRETATION OF THE DATA

The purpose of this chapter was to make meaningful the data collected from questioning fifty nurses in four different hospitals.

A questionnaire was used to find out what nursing personnel knew about preventing contractural deformity, assuming that what they indicated they did was comparable to their actual practice. The responses to the questions were incorporated, irrespective of the educational background of the nurse, then classified, tabulated, analyzed, and interpreted.

Classification of Data

The randomized questions from the questionnaire were classified in the following manner:

1. Introductory Questions
2. Professional or Vocational Preparation for Nursing
3. Definition and Etiology of Contracture
4. Prevention of Contractures
5. Methods of Prevention
   Range of Motion
   Positioning
6. Preventive Methods for Specific Conditions
7. Equipment Used by the Nurse to Prevent Contractures
8. Teaching Aspects
Introductory Questions

Of the fifty nurses who responded, twenty-six were nursing attendants, fifteen were registered nurses, and nine were licensed vocational nurses.

The various hospital areas represented by the data were medical, surgical, and orthopaedic units. Three of the hospitals had combined orthopaedic and surgical units, and two of the hospitals had units accommodating both surgical and medical patients.

Twenty-five of the nursing personnel responding were currently working on a medical unit; fourteen, on a surgical unit; ten, on a combination medical and surgical unit; and one on an orthopaedic unit.

Table I shows the length of nursing experience of the fifty respondents. Twenty nurses indicated that they had been giving bedside nursing care to patients from four months to three years; thirteen had been giving bedside care from eight to fourteen years; ten, from fifteen to twenty-six years; and seven, from three to eight years. The length of nursing experience ranged from four months to twenty-six years, the average length of experience being approximately eight and one-half years.

Professional or Vocational Preparation for Nursing

The professional or vocational preparation for nursing of the total respondents is shown in Table II.

Thirteen of the registered nurses questioned were graduates from diploma schools, while two had graduated from collegiate programs.

The nine licensed vocational nurses questioned had completed the vocational nurse's course. Four of the vocational nurses indicated
### TABLE I

**LENGTH OF TIME THAT RESPONDENTS HAD BEEN GIVING NURSING CARE TO PATIENTS**

<table>
<thead>
<tr>
<th>Length of Time</th>
<th>Number of Respondents</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four months to three years</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>Three to eight years</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Eight to fourteen years</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Fifteen to twenty-six years</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
### TABLE II

**EDUCATIONAL PREPARATION OF RESPONDENTS FOR BEDSIDE NURSING**

<table>
<thead>
<tr>
<th>Educational Preparation</th>
<th>Number of Respondents</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. S. Degree</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Diploma</td>
<td>13</td>
<td>26.0</td>
</tr>
<tr>
<td>Licensed Vocational Nurses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vocational Nurse's Course</td>
<td>9</td>
<td>18.0</td>
</tr>
<tr>
<td>Nursing Attendants:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-the-job experience only</td>
<td>11</td>
<td>22.0</td>
</tr>
<tr>
<td>Nurse's aide training class from two to six weeks</td>
<td>8</td>
<td>16.0</td>
</tr>
<tr>
<td>Nursing education from six months to two years</td>
<td>5</td>
<td>10.0</td>
</tr>
<tr>
<td>Inservice education at a state institution</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Red Cross nursing class</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100.0</td>
</tr>
</tbody>
</table>
that they had additional preparation for bedside nursing. One respondent had a year of experience working in a rest home; one had hospital experience plus instruction from doctors and supervisors; one completed one and one-half years of nursing education; and one received experience while working with a registered nurse on an intensive care unit.

The educational background of the twenty-six nursing attendants questioned was varied. Eleven attendants learned by experience on the job only, while eight had a nurse's aide training class of from two to six weeks. Five respondents had completed from six months to two years of nursing education and one attendant participated in inservice education at a state institution. One attendant had only completed a Red Cross nursing course.

Twenty-two respondents stated that they did not receive any instruction at the hospital where they were currently employed that would give them a better preparation for preventing contractures. The twenty-eight respondents that received some type of instruction, giving them a better preparation for contracture prevention, received this information in various ways. Forty-three percent of the twenty-eight respondents stated that they had received instruction through the inservice education program, including educational films and lectures; and ten percent, by team conferences conducted by a physical therapist. A summary of responses is shown in Table III.

In addition to explaining the educational plan by which they had received instruction at their hospitals of current employment, numerous respondents included specific information learned, as shown by Table IV.
### TABLE III

**HOW TOTAL RESPONDENTS RECEIVED INSTRUCTION AT HOSPITAL OF CURRENT EMPLOYMENT**

<table>
<thead>
<tr>
<th>Educational Plan</th>
<th>Number of Respondents</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>No instruction</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Team conferences given by physical therapist</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Educational films</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Inservice education</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Lectures</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Instruction from head nurse</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Instruction from doctors</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Instruction from team leader</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Instruction from supervisor</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Experience on the unit</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Books from the library</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Staff meetings</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Observing physical therapist</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100</strong></td>
</tr>
<tr>
<td>Specific Information</td>
<td>Number of Respondents</td>
<td>Percent of Respondents</td>
</tr>
<tr>
<td>----------------------------------------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Positioning of patients</td>
<td>4</td>
<td>30.7</td>
</tr>
<tr>
<td>Range of motion</td>
<td>2</td>
<td>15.4</td>
</tr>
<tr>
<td>Use of range of motion during the bath</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>Adjusting the bed to different positions</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>Gentle consideration and tact with patients</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>Use of foot board and handrolls</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>Encouraging patients to exercise extremeties</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>Cause and prevention of contractures</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>Positioning a patient with a cerebral vascular accident</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Summary

The nursing personnel questioned consisted of thirteen registered nurses, nine licensed vocational nurses, and twenty-six nursing attendants. Eleven of the twenty-six nursing attendants had no other preparation for bedside nursing other than on-the-job experience, which would appear to indicate a need for more nurse aide training courses. Forty-four percent of the total respondents indicated that they did not receive any instruction at the hospital of current employment that would give them a better understanding of their role in preventing contractural deformity. Only twelve of the twenty-eight respondents who had received instruction, received this instruction through the inservice educational program, including films and lectures. This would seem to point out the need for more emphasis to be placed on the preventive aspect of rehabilitation in the inservice programs.

Definition and Etiology of Contracture

Fifty percent of the respondents indicated that a contracture is best defined as a permanent shortening of a muscle and other soft tissue. Thirty percent defined contracture as a muscle weakness. Of the five multiple choices given to the question, thirteen percent chose "other," meaning that the term was best defined by some other definition. Five percent of the respondents indicated that contracture was best defined as footdrop and two percent, as frozen shoulder. Fifty percent of the respondents were aware that a contracture is a permanent shortening of a muscle and the surrounding soft tissue. Thirty-seven percent associated the word contracture with muscle weakness, footdrop and the term
frozen shoulder, which implies that they were not considering the possibility of contractural formation in other body joints and the deformity that results from contracture.

By response, eighty-six percent of the personnel questioned indicated that a contracture develops when a muscle group is held in a flexed or bent position for long periods of time, and twelve percent did not know if a contracture would develop or not under these conditions. Two percent felt that a contracture would not develop. Although the respondents were not aware of what a contracture really was, there seemed to be a general understanding of the etiology of contracture.

Table V shows the various responses to the question as to the cause of footdrop. Sixty-four percent of the respondents indicated that the tendency to develop footdrop in the patient on bedrest was due to the following combination of factors: (1) weakness of muscles that hold the foot up, (2) weight of the bedclothes, and (3) the pull of gravity. Some of the respondents checked more than one answer, therefore from the sixty responses, thirty-two percent of the nursing personnel felt that only weakness of muscles that hold the foot up contributed to footdrop. Twenty percent felt that it was due to the weight of the bedclothes, and two percent, the pull of gravity. Two percent did not know the cause. Thirty-six percent of the nurses were not aware of the combination of factors that contribute to the development of footdrop. This lack of understanding would inhibit nursing personnel from carrying out adequate preventive measures.

Eighty-two percent of the respondents knew that patients find relief from fatigue, pain, and restlessness by bending joints, while fourteen percent indicated that this was not true. Four percent did not know
### TABLE V

FACTORS INDICATED BY RESPONDENTS WHICH FAVOR THE DEVELOPMENT OF FOOTDROP

<table>
<thead>
<tr>
<th>Factors Indicated</th>
<th>Responses</th>
<th>Percent of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination of factors below</td>
<td>32</td>
<td>53.3</td>
<td>64.0</td>
</tr>
<tr>
<td>Weakness of muscles that hold the foot up</td>
<td>16</td>
<td>26.6</td>
<td>32.0</td>
</tr>
<tr>
<td>Weight of the bedclothes</td>
<td>10</td>
<td>16.7</td>
<td>20.0</td>
</tr>
<tr>
<td>Pull of gravity</td>
<td>1</td>
<td>1.7</td>
<td>2.0</td>
</tr>
<tr>
<td>Don't know</td>
<td>1</td>
<td>1.7</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>* 60</td>
<td>100.0</td>
<td>120.0</td>
</tr>
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</table>

<table>
<thead>
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<th>Number of Responses</th>
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</tr>
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<tbody>
<tr>
<td>0</td>
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<tr>
<td>1</td>
<td>39</td>
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<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>

Average number of responses per person - 1.20

*Tabulation of responses made by 50 respondents.
whether it was a true or false statement. This apparent awareness would tend to motivate respondents to help relieve the patient's fatigue, pain, and restlessness in some other way.

Through the questionnaire, the respondents were given a list of patients with various problems and asked to indicate which five patients would be most likely to develop a contracture. This was done in an effort to categorize their thinking as to the underlying cause of contractures. Table VI shows responses to this question. Ninety percent of the nursing personnel indicated that patients with a long-term illness would be likely to develop a contracture. Eighty-four percent indicated the aged as being susceptible; eighty-two percent, patients with arthritis; seventy-four percent, patients with neuro-muscular disease; seventy percent, patients in casts and traction; thirty-eight percent, uncooperative patients; twenty-two percent, amputees; and six percent, patients with a venereal disease. Twenty-eight percent did not associate the muscle imbalance, pain, and immobilization of the amputee with contracture formation. Approximately twenty-five percent of the respondents indicated that paralysis or an enforced rest of a part by casting or traction was apparently not thought of in terms of immobilization.

Summary

Fifty percent of the fifty respondents knew the definition of a contracture, although eighty-six percent knew the etiology. Thirty-six percent of the respondents lacked understanding as to the combination of factors contributing to the development of footdrop, which would inhibit them from carrying out adequate preventive measures. There was a general understanding by the respondents that patients bend joints in order to
# TABLE VI

**TYPE OF PATIENT MOST LIKELY TO DEVELOP A CONTRACTURE**

**AS INDICATED BY RESPONDENTS**

<table>
<thead>
<tr>
<th>Type of Patient</th>
<th>Responses</th>
<th>Percent of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients with long-term illness</td>
<td>45</td>
<td>19.0</td>
<td>90.0</td>
</tr>
<tr>
<td>The aged</td>
<td>42</td>
<td>17.8</td>
<td>84.0</td>
</tr>
<tr>
<td>Patients with arthritis</td>
<td>41</td>
<td>17.4</td>
<td>82.0</td>
</tr>
<tr>
<td>Patients with neuro-muscular disease</td>
<td>38</td>
<td>16.1</td>
<td>74.0</td>
</tr>
<tr>
<td>Patients in casts and traction</td>
<td>35</td>
<td>14.8</td>
<td>70.0</td>
</tr>
<tr>
<td>Uncooperative patients</td>
<td>19</td>
<td>8.1</td>
<td>38.0</td>
</tr>
<tr>
<td>The amputee</td>
<td>11</td>
<td>4.7</td>
<td>22.0</td>
</tr>
<tr>
<td>Patients with venereal disease</td>
<td>3</td>
<td>1.3</td>
<td>6.0</td>
</tr>
<tr>
<td>Patients with bathroom privileges only</td>
<td>1</td>
<td>0.4</td>
<td>2.0</td>
</tr>
<tr>
<td>Don't know</td>
<td>1</td>
<td>0.4</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>236</td>
<td><strong>100.0</strong></td>
<td><strong>470.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Responses</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

Average number of responses per person = 4.66

*Tabulation of responses made by 50 respondents.*
find relief from pain, restlessness, and fatigue. This insight would motivate nurses to help relieve the patient's fatigue, pain, and restlessness in another way. The fact that the respondents were aware of immobilization as a primary cause of contractures was manifested by the response by eighty-six percent of the respondents that contracture develops when a muscle group is held in a flexed position for long periods of time, and by ninety percent agreeing that patients with long-term illness are likely to develop a contracture. Twenty-eight percent did not associate the muscle imbalance, pain, and immobilization of the amputee with contracture formation. Seventy-four percent felt that patients with neuromuscular disease were likely to develop a contracture, and seventy percent that patients in casts and traction were likely to develop contractures. This indicates that paralysis or an enforced rest of a part by casting or traction was not considered as immobilization by some.

Prevention of Contractures

Seventy percent of the respondents indicated that contractures can be prevented by nursing procedures, while twenty-two percent felt that very few contractures can be prevented by nursing procedures. The remaining eight percent did not know if contractures could be prevented by nursing procedures or not. This indicated that thirty percent of the nurses felt that contractures cannot be prevented, or did not know whether they could be prevented or not. This lack of knowledge, and acceptance of contractures as part of the patient's illness would influence the nurse from endeavoring to prevent them.

Methods of Prevention

Two questions were asked regarding precautionary measures that the
respondents were practicing. The first question was, "Which of these body areas do you most frequently check for contracture development?"

Fifty-four percent of the respondents indicated that they most frequently checked the knees; fifty percent, the feet; forty percent, the elbows; forty percent, the fingers and thumbs; forty percent, the hips; thirty percent, the wrists; twenty-two percent, the shoulders; twenty percent, the neck; and ten percent did not check any of these body areas. These findings are shown in Table VII. Approximately one-half of the respondents were checking the knees and feet most frequently for contracture development. Less than twenty-five percent were checking other body areas in which the most common preventable contractures occur. These aforementioned areas were the elbows, fingers and thumbs, hips and wrists. Less than one-fourth of the respondents were checking the shoulders and neck and ten percent were not checking any body areas.

Thirty-four percent of the respondents indicated that they checked their patients for contractural development daily; twenty percent, during the bath, and twelve percent were more specific, indicating that they checked both daily and during the bath. Six percent checked whenever they thought of it; six percent checked very seldom and four percent never checked their patients for contractures at all. Eighteen percent indicated that they checked patients for contractures other than the times designated on the questionnaire. Sixty-six percent of the nursing personnel were checking their patients daily for the development of contractures.

In answer to the question, "Contractures can be prevented most effectively by which of the following methods?", ninety percent of the
### TABLE VII

**BODY AREAS MOST FREQUENTLY CHECKED BY RESPONDENTS FOR CONTRACTURE DEVELOPMENT**

<table>
<thead>
<tr>
<th>Body Areas Checked</th>
<th>Responses</th>
<th>Percent of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knees</td>
<td>27</td>
<td>17.7</td>
<td>54.0</td>
</tr>
<tr>
<td>Feet</td>
<td>25</td>
<td>16.4</td>
<td>50.0</td>
</tr>
<tr>
<td>Elbows</td>
<td>20</td>
<td>13.0</td>
<td>40.0</td>
</tr>
<tr>
<td>Fingers and thumbs</td>
<td>20</td>
<td>13.0</td>
<td>40.0</td>
</tr>
<tr>
<td>Hips</td>
<td>20</td>
<td>13.0</td>
<td>40.0</td>
</tr>
<tr>
<td>Wrists</td>
<td>15</td>
<td>9.9</td>
<td>30.0</td>
</tr>
<tr>
<td>Shoulders</td>
<td>11</td>
<td>7.2</td>
<td>22.0</td>
</tr>
<tr>
<td>Neck</td>
<td>10</td>
<td>6.6</td>
<td>20.0</td>
</tr>
<tr>
<td>None of these</td>
<td>5</td>
<td>3.2</td>
<td>10.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>153</strong></td>
<td>100.0</td>
<td>306.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Responses</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>12</td>
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<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>1 (1)</td>
</tr>
</tbody>
</table>

Average number of responses per person - 3.06

*Tabulation of responses made by 50 respondents.*
respondents indicated that changing positions frequently was the most effective method of preventing contractures. Seventy-four percent felt that full range of motion daily was most effective; thirty-six percent, massaging joints; fourteen percent, that proper diet was effective; six percent, a semi-sitting position as much as possible; two percent did not know which methods were most effective; and no one indicated that lying flat in bed most of the time was effective. The responses to this question are summarized in Table VIII and point out an awareness by ninety percent of the respondents that alternating positions is effective in preventing contractures. Twenty-five percent of the respondents were not aware of range of motion as an effective method. There was a lack of knowledge as to the effectiveness of a position of full extension in preventing contractures. Thirty-six percent felt that massage was most effective, which points out a lack of understanding as to the need of actually putting the joint through its full normal range of motion in order to prevent a permanent shortening of the surrounding tissue, rather than just improving the circulation and muscle tone in the area by massage.

Summary

Although sixty-six percent of the nurses were checking their patients for contractures at least once daily, only fifty-four percent were checking the knees, and fifty percent, the feet. Less than fifty percent of the nurses were checking the elbows, wrists, fingers, thumbs, and hips; and less than twenty-five percent were checking the shoulders and neck. These aforementioned body areas are ones in which preventable contractures most commonly occur. Ten percent of the nurses were not
### TABLE VIII

**METHOD RESPONDENTS INDICATED AS MOST EFFECTIVE IN PREVENTING CONTRACTURES**

<table>
<thead>
<tr>
<th>Methods of Prevention</th>
<th>Responses</th>
<th>Percent of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changing positions frequently</td>
<td>45</td>
<td>40.5</td>
<td>90.0</td>
</tr>
<tr>
<td>Full range of motion daily</td>
<td>37</td>
<td>33.3</td>
<td>74.0</td>
</tr>
<tr>
<td>Massaging joints</td>
<td>18</td>
<td>16.2</td>
<td>36.0</td>
</tr>
<tr>
<td>Proper diet</td>
<td>7</td>
<td>6.3</td>
<td>14.0</td>
</tr>
<tr>
<td>Semi-sitting position as much as possible</td>
<td>3</td>
<td>2.8</td>
<td>6.0</td>
</tr>
<tr>
<td>Don't know</td>
<td>1</td>
<td>.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Lying flat in bed most of the time</td>
<td>0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>*111</td>
<td><strong>100.0</strong></td>
<td><strong>222.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Responses</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
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<tr>
<td>3</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>50</td>
</tr>
</tbody>
</table>

Average number of responses per person - 2.22

*Tabulation of responses made by 50 respondents.*
checking any body areas. Twenty-five percent of the nurses included in
the sample were not aware that range of motion was an effective method of
preventing contractures. There was a general awareness by ninety percent
of the respondents that alternating positions frequently was effective.
There was a lack of understanding as to the value of a position of full
extension of the joints and that massage, without the movement of the
joint through its full range of motion, is not effective in preventing
contractures.

**Range of Motion.** Range of motion, as given to body joints by re-
respondents, is shown in Table IX. Sixty-two percent most frequently
exercised the knees; fifty-two percent, the elbows; fifty percent, the
shoulders; forty-six percent, the feet; forty percent, the fingers and
thumbs; twenty-eight percent, the hips; fourteen percent did not give
range of motion to any body joints; and four percent gave range of
motion to joints not listed. Nursing personnel lack an awareness of
body joints most commonly affected by contractural deformity.

When asked how long it takes a nurse to give range of motion,
fifty-two percent of the respondents answered that it takes ten minutes.
Twenty-six percent answered that it takes twenty minutes; fourteen per-
cent, that it takes five minutes; and twelve percent, that it takes
twenty-five minutes. Six percent did not know how long it took. Thirty-
eight percent agreed that it takes more than ten minutes to give range of
motion. This concept of range of motion taking so much of the nurse's
time may influence her from giving it routinely.

The question was asked, "How often do you give range of motion
exercise to patients on bedrest?" The answers to this question are
TABLE IX

BODY JOINTS MOST FREQUENTLY GIVEN RANGE OF MOTION
BY RESPONDENTS

<table>
<thead>
<tr>
<th>Body Joints</th>
<th>Responses</th>
<th>Percent of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knees</td>
<td>31</td>
<td>20.9</td>
<td>62</td>
</tr>
<tr>
<td>Elbows</td>
<td>26</td>
<td>17.6</td>
<td>52</td>
</tr>
<tr>
<td>Shoulders</td>
<td>25</td>
<td>17.0</td>
<td>50</td>
</tr>
<tr>
<td>Feet</td>
<td>23</td>
<td>15.5</td>
<td>46</td>
</tr>
<tr>
<td>Fingers and thumbs</td>
<td>20</td>
<td>13.5</td>
<td>40</td>
</tr>
<tr>
<td>Hips</td>
<td>14</td>
<td>9.4</td>
<td>28</td>
</tr>
<tr>
<td>None</td>
<td>7</td>
<td>4.7</td>
<td>14</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1.4</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>148</strong></td>
<td><strong>100.0</strong></td>
<td><strong>296</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Responses</th>
<th>Number of Respondents</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td></td>
</tr>
</tbody>
</table>

Average number of responses per person = 2.98

*Tabulation of responses made by 50 respondents.*
shown by Table X. Forty-two percent of the respondents gave range of motion to patients on bedrest daily as ordered. Twenty-four percent gave the range of motion routinely, without an order; twelve percent, as often as they had time to; eight percent, daily; six percent, twice daily; six percent, very seldom; and two percent marked "other" as the answer. Twenty-four percent of the respondents were aware of the nurse's responsibility in giving range of motion routinely without a doctor's order to prevent contractures.

In answer to the question, "Is it dangerous for a nurse to give range of motion to the point of tenderness and pain?", sixty-six percent answered that it was dangerous; twenty-eight percent did not think it was dangerous; and six percent did not know if it were dangerous or not. The opinion that it may be dangerous for a nurse to give range of motion to the point of tenderness and pain, as held by seventy-two percent of the respondents, could influence the amount of exercise given, and an acceptance of their responsibility.

Thirty-six percent of the nurses believed that it is a physiologically proven fact that contractural deformity will not develop if range of motion is done once daily. Thirty-six percent did not know if this statement was true or not. Therefore, over one-half of the respondents did not know that contractural deformity could be prevented by giving range of motion once daily.86

Seventy-eight percent of the respondents indicated that the nurse has a responsibility for giving the patient active and passive exercise,
<table>
<thead>
<tr>
<th>Frequency</th>
<th>Number of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only as ordered</td>
<td>21</td>
<td>42</td>
</tr>
<tr>
<td>Routinely, without an order</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>As often as I have time</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Daily</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Twice daily</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Very seldom</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
even though the patient is going to physical therapy daily. Fourteen percent responded that the nurse no longer had any responsibility for the patient's exercise if the patient was going to physical therapy, and eight percent did not know the nurse's responsibility in this situation. Therefore, twenty-two percent of the nurses were not accepting the responsibility of the patient's exercise if the patient was going to physical therapy.

Many of the principles of how range of motion should be given seemed to be well understood by the respondents, as ninety percent indicated that in giving range of motion, the extremities should be lifted carefully, adequately supporting the joint; eighty-two percent, that explanation should be given to the patient concerning the procedure; and eighty percent, that movements should be slow and gentle. Two percent indicated that movements, to be effective, must be forced. The two principles that were not as well understood regarding the administration of range of motion were as follows: thirty percent did not think it was important for the nurse to know the normal range of joint motion, and fourteen percent felt that it was sufficient to give the joint movement only once in each direction. The complete list of responses to this question are shown by Table XI. The facts that extremities should be lifted carefully and supported, and that movements should be gentle and not forced when giving range of motion, was well understood. The respondents lacked an awareness of the importance of the nurse knowing the normal range of joint motion when giving range of motion and that the joint movement should be given more than once in each direction.


### TABLE XI

**POINTS RESPONDENTS CONSIDERED WHEN GIVING RANGE OF MOTION**

<table>
<thead>
<tr>
<th>Points Considered</th>
<th>Responses</th>
<th>Percent of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremities should be lifted carefully, supporting the joint</td>
<td>45</td>
<td>26.4</td>
<td>90</td>
</tr>
<tr>
<td>Explanation to patient of what you are going to do</td>
<td>41</td>
<td>24.1</td>
<td>82</td>
</tr>
<tr>
<td>Movement should be slow and gentle</td>
<td>40</td>
<td>23.6</td>
<td>80</td>
</tr>
<tr>
<td>Know the normal range of motion</td>
<td>35</td>
<td>20.6</td>
<td>70</td>
</tr>
<tr>
<td>Joint movements to be given once in each direction</td>
<td>7</td>
<td>4.1</td>
<td>14</td>
</tr>
<tr>
<td>Movements, to be effective, must be forced</td>
<td>1</td>
<td>.6</td>
<td>2</td>
</tr>
<tr>
<td>Don't know</td>
<td>1</td>
<td>.6</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>170</strong></td>
<td><strong>100.0</strong></td>
<td><strong>340</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
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<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
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<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>24</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>50</strong></td>
</tr>
</tbody>
</table>

Average number of responses per person - 3.4

*Tabulation of responses made by 50 respondents.*
Summary

Ten percent of the nurses questioned were not giving range of motion to any body joints and the data indicated that there was a lack of awareness as to the body joints that are most frequently affected by contractural deformity. Thirty-eight percent of the nurses agreed that it takes more than ten minutes to give range of motion. This concept of range of motion taking so much of the nurse's time may influence her from giving it routinely. Only twenty-four percent of the respondents were aware of the nurse's responsibility in giving range of motion routinely, without a doctor's order to prevent contractures. One reason why almost twenty-five percent of the respondents were giving range of motion only as ordered may be that seventy-two percent felt that it was dangerous for a nurse to give range of motion to the point of tenderness and pain, and only thirty-six percent believed that contractural deformity will not develop if range of motion is done once daily. Twenty-two percent of the nurses questioned were not accepting their responsibility for the patient's exercise if the patient was going to physical therapy daily. The fact that in giving range of motion the extremities should be lifted carefully and supported, and that movements should be non-forced and gentle was generally understood by the respondents.

There was a lack of knowledge of the importance of the nurse knowing the normal range of joint motion when giving range of motion and that the joint movement should be given more than once in each direction.

Positioning. There seemed to be a general understanding by the respondents that patients should be turned at least every two hours, as eighty-six percent answered that the maximum time that they left their
patients in one position was for two hours. Six percent changed their patient's position every hour; four percent, every three hours; and two percent did not know how often they turned their patients.

When asked the primary function of turning, fifty percent of the respondents answered that the patient's comfort was the primary function. Although eighty-six percent of the fifty nurses questioned were cognizant of the fact that patients should not be left in one position for more than two hours, they were not aware of the primary reason for this change in position.

In changing patients' positions, ninety-two percent of the respondents indicated that the position they most frequently used was the sidelying position; four percent, the supine position; two percent, both the sidelying and supine positions; and two percent, the supine and prone positions. This data indicates that nursing personnel are not aware of the importance of complete extension of body joints in preventing contractures.

The question was asked, "Do you ever place your patients in the prone position?" Seventy-two percent answered that they did use this alternate position, and twenty-eight percent that they did not use it. This implies that twenty-eight percent were not knowledgeable as to the beneficial effects of this alternate position.

Forty percent of the respondents were in agreement that a pillow could be used under the knees of a patient for more than two hours. Here, again, this percentage of respondents was thinking of turning or position change only in terms of the patient's comfort.

The statement that in the sidelying position comfort demands that
one hip and knee be flexed, was considered to be true by ninety percent of the respondents. As evidenced by this data, in positioning the patient the respondents' first thought concerned comfort.

Forty-six percent of the respondents defined a correct bed position as one which approximates a good standing position. Thirty percent did not think this definition was true, and twenty-four percent did not know the correct answer. This implies that fifty-four percent of the respondents were not cognizant of the functional position the patient would assume while standing.

Fifty-six percent answered the following question in the affirmative. "When in the prone position, the shoulders should be supported on small pads or towels." Twenty-four percent indicated that the statement was false and twenty percent did not know. Forty-four percent were not aware that in the prone position the shoulders have a tendency to rotate internally.

Summary

Although there seemed to be a general understanding by the respondents that patients' positions should be changed frequently, fifty percent of the respondents did not know the primary purpose of turning, and forty percent indicated that they considered the patient's comfort primary to the prevention of deformity. Twenty-eight percent were not using the prone position in alternating patient positions, indicating a lack of knowledge of the importance of full extension of all body joints in preventing contractures. Fifty-four percent of the respondents were not cognizant of the functional position the patient would assume while standing.
Preventive Methods for Specific Conditions

Ninety-two percent of the nurses questioned indicated that special measures should be taken to prevent contractures from developing in patients with paralysis. This indicates a general understanding that paralysis is a contributing factor to contractural deformity. Fifty-six percent indicated that a paralyzed arm should be placed comfortably across the patient's abdomen and six percent did not know if this were the proper position for the arm or not. More than fifty percent of the respondents thought that the patient's comfort was of prime importance, and were not aware of the danger in having this paralyzed arm in a flexed position.

The respondents were asked when they felt range of motion should be started on a patient with a cerebral vascular accident. As shown in Table XII, sixty percent responded that range of motion should be started after the acute stage of the illness is over; eighteen percent, on onset of illness; fourteen percent, twenty-four hours after onset; six percent did not know, and two percent felt that range of motion should be started three days after onset. More than fifty percent of the respondents were not aware of the importance of the prevention of deformity along with the intensive life-saving measures twenty-four hours after the onset of a cerebral vascular accident.

Summary

Although ninety-two percent of the respondents agreed that special measures should be taken to prevent a patient with a cerebral vascular accident from developing contractures, fifty-six percent of the nurses questioned considered comfort of primary importance, rather than the
<table>
<thead>
<tr>
<th>Range of Motion Begun</th>
<th>Number of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>After acute stage of illness is over</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>On onset of illness</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Twenty-four hours after onset</td>
<td>7</td>
<td>14</td>
</tr>
<tr>
<td>Don't know</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>Three days after onset</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>
flexion of a joint in positioning a paralyzed arm. Sixty-eight percent of the respondents were not aware of the importance of the prevention of deformities along with the intensive life-saving measures.

**Equipment Used by the Nurse to Prevent Contractures**

The respondents were asked which pieces of equipment they specifically used to prevent contractures from developing. Seventy-six percent indicated that they used the footboard; sixty-eight percent, a rubber ball or sponge in the hand of the patient; fifty-two percent, sandbags; forty-eight percent, overhead bar; forty percent, footcradle; thirty-two percent, firm mattress; twenty-eight percent, whirlpool; and eighteen percent, fomentations. The complete list of responses is shown in Table XIII. The responses from this question indicated that many of the respondents were not aware of the relationship between pieces of equipment used, such as sandbags, overhead bar, footcradle, firm mattress, and bedboards, and the formation of contractures. Forty-six percent of the nursing personnel were not cognizant of the fact that fomentations and whirlpool baths by themselves, without putting the joint through its normal range of motion, are ineffective methods of preventing contractures.

**Teaching Aspects**

Ninety-eight percent of the responses indicated that it is a nurse's responsibility to teach and encourage self-care on the part of the patient, indicating a general understanding of this concept. Thirty-two percent did not see the necessity of teaching range of motion to the patient's family, although fifty-eight percent agreed that it was beneficial. Ten percent did not know if range of motion should be taught to the family or not. In summary, the principle of teaching the
### Table XIII

**Equipment Used by Respondents to Prevent Contractures**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Responses</th>
<th>Percent of Responses</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Footboard</td>
<td>38</td>
<td>18.7</td>
<td>76</td>
</tr>
<tr>
<td>Rubber ball or sponge in hand</td>
<td>34</td>
<td>16.7</td>
<td>68</td>
</tr>
<tr>
<td>Sandbags</td>
<td>26</td>
<td>12.7</td>
<td>52</td>
</tr>
<tr>
<td>Overhead bar</td>
<td>24</td>
<td>11.8</td>
<td>48</td>
</tr>
<tr>
<td>Foot cradle</td>
<td>20</td>
<td>9.7</td>
<td>40</td>
</tr>
<tr>
<td>Firm mattress</td>
<td>16</td>
<td>7.8</td>
<td>32</td>
</tr>
<tr>
<td>Whirlpool</td>
<td>14</td>
<td>6.8</td>
<td>28</td>
</tr>
<tr>
<td>Bedboards</td>
<td>13</td>
<td>6.4</td>
<td>26</td>
</tr>
<tr>
<td>Fomentations</td>
<td>9</td>
<td>4.4</td>
<td>18</td>
</tr>
<tr>
<td>Siderails</td>
<td>5</td>
<td>2.4</td>
<td>10</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>2</td>
<td>1.8</td>
<td>4</td>
</tr>
<tr>
<td>Don't know</td>
<td>2</td>
<td>1.0</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>*203</td>
<td><strong>100.0</strong></td>
<td><strong>406</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Responses</th>
<th>Number of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
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<td>3</td>
<td>12</td>
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<tr>
<td>4</td>
<td>7</td>
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<td>4</td>
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<td>10</td>
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<td>7</td>
<td>1</td>
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<tr>
<td>8</td>
<td>2</td>
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<tr>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>1</td>
</tr>
</tbody>
</table>

Average number of responses per person - 4.06

*Tabulation of responses made by 50 respondents.*
patient's family range of motion was not understood by forty-two percent of the respondents. The concept that it is the nurse's responsibility to teach and encourage self-care on the part of the patient was well understood.

Summary

Of the fifty nurses who responded, twenty-six were nursing attendants, fifteen registered nurses, and nine were licensed vocational nurses. The length of nursing experience ranged from four months to twenty-six years.

The findings concerning professional or vocational preparation for nursing indicated a need for a more comprehensive inservice education program. Further findings indicated that eighty-six percent of the respondents knew the etiology of contracture, but only one-half knew the definition. The respondents indicated an awareness of the fact that immobilization is the primary cause of contractures. Twenty-eight percent did not associate the muscle imbalance, pain, and immobilization of the amputee with contracture formation, and paralysis or an enforced rest of a part by casting or traction was not considered as immobilization by approximately twenty-five percent of the respondents.

Thirty percent of the nurses felt that contractures could not be prevented, or did not know whether they could be prevented or not. This lack of knowledge, and acceptance of contractures as part of the patient's illness would influence the nurse from endeavoring to prevent them.

Although sixty-six percent of the nurses were checking their patients for contractures at least once daily, only fifty-four percent were checking the knees, and fifty percent, the feet. Less than fifty percent
of the nurses were checking the elbows, wrists, fingers, thumbs, and hips; and less than twenty-five percent were checking the shoulders and neck. These aforementioned body areas are ones in which preventable contractures most commonly occur. Ten percent of the nurses were not checking any body areas. Twenty-five percent of the nurses included in the sample were not aware that range of motion was an effective method of preventing contractures. There was a general awareness by ninety percent of the respondents that alternating positions frequently was effective. There was a lack of understanding as to the value of a position of full extension of the joints and that massage, without the movement of the joint through its full range of motion, is not effective in preventing contractures. Ten percent of the nurses questioned were not giving range of motion to any body joints and the data indicated that there was a lack of awareness as to the body joints that are most frequently affected by contractural deformity. Thirty-eight percent of the nurses agreed that it takes more than ten minutes to give range of motion. This concept of range of motion taking so much of the nurse's time may influence her from giving it routinely. Only twenty-four percent of the respondents were aware of the nurse's responsibility in giving range of motion routinely, as an integral part of nursing care, without a doctor's order. One reason why almost fifty percent of the respondents were giving range of motion only as ordered may be that seventy-two percent felt that it was dangerous for a nurse to give range of motion to the point of tenderness and pain, and only thirty-six percent believed that contractural deformity will not develop if range of motion is done once daily. Twenty-two percent of the nurses were not accepting their responsibility for the patient's exercise
if the patient was going to physical therapy daily. The fact that in
giving range of motion the extremities should be lifted carefully and
supported, and that movements should be non-forced and gentle was gener-
ally understood. There was a lack of knowledge of the importance of the
nurse knowing the normal range of joint motion when giving range of
motion and that the joint movement should be given more than once in
each direction.

Although there seemed to be a general understanding by the re-
spondents that patients' positions should be changed frequently, fifty
percent of the respondents did not know the primary purpose of turning,
and forty percent indicated that they considered the patient's comfort
primary to the prevention of deformity. Twenty-eight percent were not
using the prone position in alternating patient positions, indicating
a lack of knowledge of the importance of full extension of all body
joints in preventing contractures. Fifty-four percent of the respondents
were not cognizant of the functional position the patient would assume
while standing.

Although ninety-two percent of the respondents agreed that special
measures should be taken to prevent a patient with a cerebral vascular
accident from developing contractures, fifty-six percent of the nurses
questioned considered comfort of primary importance, rather than the
flexion of a joint in positioning a paralyzed arm. Sixty-eight percent
of the respondents were not aware of the importance of the prevention of
deformities along with the intensive life-saving measures.

Many of the respondents were not aware of the relationship between
pieces of equipment used, and the formation of contractures. Forty-six
percent were not cognizant of the fact that fomentations and whirlpool baths by themselves, without putting the joint through its normal range of motion, were not effective methods of preventing contractures.

The concept was generally understood that it was the nurse's responsibility to teach and encourage self-care on the part of the patient. The principle of teaching the patient's family range of motion was not understood by forty-two percent of the respondents.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

The problem concerned with in this study was to find out what understanding nursing personnel has relative to the prevention of contractures. Because the prevention of contractures should be primarily the function of nurses, and an integral part of nursing care, a study such as this was needed to ascertain the knowledge of nursing personnel relative to their prevention. The secondary purpose of this study was to utilize the information gained from the data to strengthen inservice education programs and ultimately to improve nursing care.

It was hypothesized that there is a lack of knowledge on the part of the bedside nurse of the procedures necessary in preventing contractures and of nursing's significant role in this prevention. The assumptions were made that nursing care is a major factor in preventing contractures; that if nursing personnel have the necessary knowledge, they will put it into practice; and by determining the knowledge the nurses had concerning contracture prevention, the initial step would be taken in improving nursing care.

The descriptive-survey method was chosen for this study. Literature was reviewed to identify principles concerning contractures and their prevention. The information gained from this review served as a background of knowledge used in developing the data-gathering tool. The
questionnaire was the tool selected to obtain knowledge of nursing personnel pertinent to the study. A pilot study was conducted to acquaint the researcher with the administration of the questionnaire and to help in clarifying the questions. Fifty nurses giving bedside care were selected at random, irrespective of educational background, from four hospitals and asked to participate in the survey.

The sample consisted of twenty-six nursing attendants, fifteen registered nurses, and nine licensed vocational nurses, with an average length of nursing experience of approximately eight and one-half years.

Findings indicated that the etiology of contracture was well understood, although the respondents lacked understanding as to the definition of the term. Approximately one-fourth of the respondents did not associate the immobilization of the amputee, paralysis, or an enforced rest of a part by casting or traction with contracture formation. Further findings indicated that thirty percent of the respondents have accepted contracture development as a part of the patient's illness. Although sixty-six percent of the nurses were checking their patients for contractures at least once daily, approximately fifty percent of them were checking the elbows, wrists, fingers, thumbs, and hips; and less than twenty-five percent were checking the shoulders and neck, all of which are body areas in which the most common preventable contractures occur. This indicates a lack of awareness as to the body joints most frequently affected by contractures. Ninety percent of the respondents were aware that alternating positions frequently was an effective method of preventing contractures, but twenty-five percent of the nurses were not aware that range of motion was an effective method.
There was a lack of understanding as to the value of a position of full extension of the joints and that massage and whirlpool baths, without the movement of the joint through its full range of motion, are not effective in preventing contractures. The concept was held by thirty-eight percent of the respondents that giving range of motion takes more than ten minutes of the nurse's time. This opinion may weaken her determination to give it routinely. One reason why almost one-half of the respondents were giving range of motion only as ordered may be that seventy-two percent felt that it was dangerous for a nurse to give range of motion to the point of tenderness and pain, and only thirty-six percent believed that contractural deformity will not develop if range of motion is done once daily.

The fact that in giving range of motion the extremities should be lifted carefully and supported, and that movements should be non-forced and gentle was generally understood. There was a lack of knowledge of the importance of the nurse knowing the normal range of joint motion when giving range of motion and that the joint movement should be given more than once in each direction.

Although there seemed to be a general understanding by the respondents that patients' positions should be changed frequently, forty percent indicated that they considered the patient's comfort primary to the prevention of deformity. A lack of knowledge was indicated of the importance of full extension of all body joints in preventing contractures. Sixty-eight percent of the respondents were not aware of the importance of the prevention of deformities along with intensive life-saving measures. Many of the respondents were not aware of the
relationship between pieces of equipment used and the formation of contractures. The concept was generally understood that it is the nurse's responsibility to teach and encourage self-care on the part of the patient. The principle of teaching the patient's family range of motion was not understood by forty-two percent of the respondents.

II. CONCLUSIONS

The following conclusions, drawn from the findings of the study, indicated that the respondents lacked understanding of many of the principles of preventing contractures, although in some areas their understanding seemed adequate:

1. Although nursing personnel are cognizant of the fact that immobilization is the cause of contractures and that frequent position change is important, there exists a lack of understanding of many of the underlying principles of contracture prevention and effective nursing procedures and equipment that can be utilized in this prevention.

2. Nursing personnel lack instruction regarding the prevention of contractural deformity.

3. The hypothesis that there is a lack of knowledge on the part of the bedside nurse of the nursing procedures necessary in preventing contractures, and of nursing's significant role in this prevention, was supported by the findings of this study.
III. RECOMMENDATIONS

The following recommendations, based on the conclusions that were drawn from the findings, were made:

1. It is recommended that hospital inservice education programs incorporate the principles of contracture prevention into their curriculum and plan to give all nursing personnel adequate knowledge concerning these principles.

2. A study is recommended to discover the opinions of physicians regarding nurses giving range of motion without a specific written order.
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BIBLIOGRAPHY

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Mercita, Sister Mary. "Rehabilitation - Bridge to a Useful and Happy Life," Nursing Outlook, 10:581-583, September, 1962.


C. UNPUBLISHED MATERIALS

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QUESTIONNAIRE

Hospital:

Unit: Med. Surg.: Ortho.

Position: R.N. L.V.N. Nursing Attendant

1. To what body joints do you most frequently give range of motion exercise?
   a. Knees          e. Fingers and thumbs
   b. Elbows         f. Feet
   c. Hips           g. Other
   d. Shoulders      h. None

2. To give full range of motion exercise to major body joints takes the nurse approximately –
   a. 25 minutes
   b. 10 minutes
   c. 5 minutes
   d. 20 minutes

3. How often do you give range of motion exercise to patients on bedrest?
   a. Routinely, without an order
   b. Daily
   c. Twice daily
   d. Very seldom
   e. As often as I have time to
   f. Only when ordered
g. I never had time to do it
h. Other

4. It is unnecessary to teach range of motion exercise to the patient's family.
   TRUE    FALSE    DON'T KNOW

5. Very few contractures can be prevented by nursing procedures.
   TRUE    FALSE    DON'T KNOW

6. If the patient is going to physical therapy daily, the nurse no longer has any responsibility for giving active or passive exercise.
   TRUE    FALSE    DON'T KNOW

7. Exercise should be begun on patients with a cerebral vascular accident -
   a. on onset of illness
   b. 24 hours after onset
   c. 3 days after onset
   d. after acute stage of illness is over

8. What is the maximum length of time you leave your patients in one position?
   a. 2 hours
   b. 1 hour
   c. 3 hours
   d. Until they ask to be turned
9. A contracture develops when a muscle group is held in a flexed or bent position for long periods of time.
   TRUE FALSE DON'T KNOW

10. Patients find relief from fatigue, pain, and restlessness by bending joints.
    TRUE FALSE DON'T KNOW

11. A pillow can be used under the knees for more than two hours while in the back lying position, as it affords a measure of comfort for the patient.
    TRUE FALSE DON'T KNOW

12. No special preventive measures need be taken to prevent contractures from developing on patients with paralysis.
    TRUE FALSE DON'T KNOW

13. In the side-lying position, comfort demands that one hip and knee be flexed.
    TRUE FALSE DON'T KNOW

14. With the bed patient, there is a tendency to develop footdrop, or plantar flexion, because of -
    a. the pull of gravity
    b. the weight of the bedclothes
    c. the weakness of muscles that hold the foot up
    d. any combination of these factors
15. Which five of the following patients would be most likely to develop a contracture?

a. Patients with a long-term illness
b. Patients in casts and traction
c. Patients allowed bathroom privileges only
d. The aged
e. The amputee
f. The patient with a neuromuscular disease
g. Uncooperative patients
h. Patients with arthritis
i. Patients with a venereal disease

16. It is the nurse's responsibility to teach and encourage self-care on the part of the patient.

TRUE FALSE DON'T KNOW

17. In changing your patient's position, which of these three positions do you most frequently use?

a. Supine (backlying)
b. Prone (facelying)
c. Side-lying

18. Which of these body areas do you most frequently check for contracture development?

a. Hips
e. Elbows
b. Knees
f. Shoulders
c. Neck
g. Fingers and thumbs
d. Feet
h. Wrists
i. None of these
19. It is dangerous for a nurse to give range of motion exercise to the point of tenderness and pain.

   TRUE    FALSE    DON'T KNOW

20. A correct bed position (supine, prone, side-lying) may be defined as one which approximates a good standing position.

   TRUE    FALSE    DON'T KNOW

21. How often do you check your patients for contractures?
   a. Daily
   b. During the bath
   c. Whenever I think of it
   d. Very seldom
   e. Never
   f. Other

22. A paralyzed arm should be placed comfortably across the patient's abdomen.

   TRUE    FALSE    DON'T KNOW

23. Which of the following pieces of equipment do you use specifically to prevent contractures?
   a. Overhead bar
   b. Whirlpool
   c. Footboard
   d. Firm mattress
   e. Footcradle
   f. Rubber ball or sponge in hand
   g. Bedboards
   h. Siderails
   i. Fomentations
   j. Sandbags
   k. Ultrasound
24. Do you ever place your patients in the prone position?

   YES  NO

25. Contractures can be prevented most effectively by which of the following methods?

   a. Proper diet
   b. Full range of motion exercise daily
   c. Semi-sitting position as much as possible
   d. Lying flat in bed most of the time
   e. Changing positions frequently
   f. Massaging joints

26. The term contracture is best defined as:

   a. Footdrop
   b. Frozen shoulder
   c. Permanent shortening of a muscle and other soft tissue
   d. Muscle weakness
   e. Other

27. The primary function of turning is for the patient's comfort.

   TRUE  FALSE  DON'T KNOW

28. It is a physiological fact that contractural deformity will not develop if range of motion exercise is done once daily.

   TRUE  FALSE  DON'T KNOW

29. When in the facaleyis position the shoulders should be supported on small pads or rolled towels.

   TRUE  FALSE  DON'T KNOW
30. Which of the following points should be considered when giving range of motion exercise?

a. Know the normal range of motion
b. Movements should be slow and gentle
c. Explanation to patient of what you are going to do
d. Movements, to be effective, must be forced
e. Extremities should be lifted carefully, adequately supporting the joint
f. Joint movement to be given once in each direction

PROFESSIONAL OR VOCATIONAL PREPARATION

31. What instruction have you received during your period of employment in this hospital which has given you a better preparation for preventing contractures?

32. How long have you been giving bedside nursing care to patients?
   (not including time spent in school)

33. What educational preparation have you had for bedside nursing?
LOMA LINDA UNIVERSITY

Graduate School

SURVEY OF NURSES' UNDERSTANDING RELATIVE TO THE
PREVENTION OF CONTRACTURES

by

Dorothy Spady

An Abstract of a Thesis
In Partial Fulfillment of the Requirements
for the Degree Master of Science
in the Field of Nursing

June, 1964
ABSTRACT

The prevention of contractures and the resulting physical deformity is included as one of the basic elements of effective nursing care; therefore, this study was necessary to discover nurses' knowledge relative to the prevention of contractures. The immediate purpose was to find out what basic knowledge the nurse giving direct patient care has in regard to the principles of contracture prevention. The long-range purpose of the study was to improve inservice education, and thus improve nursing care. It was hypothesized that there is a lack of understanding on the part of the bedside nurse of the procedures necessary to prevent contractures and of nursing's significant role in this prevention. The descriptive-survey method was chosen for the study. Fifty bedside nurses, irrespective of educational preparation, were chosen from four general hospitals in the Inland Empire and questioned. A review of literature and interviews with specialists in the field served as a background of knowledge for the questionnaire used. The findings indicated that nursing personnel may have accepted contractures as part of the patient's illness and are of the opinion that range of motion should not be given by a nurse routinely as part of nursing care, thus weakening their determination to prevent this problem. The conclusions were drawn that although nursing personnel are cognizant of the fact that immobilization is the cause of contractures and that frequent position change is important, there exists a lack of understanding of many of the underlying principles of contracture prevention and effective nursing procedures.
and equipment that can be utilized in prevention. It is recommended that the principles of contracture prevention be included in hospital in-service programs and that these programs be strengthened and increased to reach all nursing personnel.