A Survey of Temperatures of Adult Medical Patients

Marilyn Ruth Verabelle Pinder

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A SURVEY OF TEMPERATURES
OF ADULT MEDICAL PATIENTS

by

Marilyn Ruth Verabelle Pinder

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

June 1966
Each person whose signature appears below certifies that he has read this thesis and that in his opinion it is adequate, in scope and quality, as a thesis for the degree Master of Science.

Carol Ann Brady, Chairman
Carol Ann Brady, Assistant Professor of Nursing

R. Maureen Maxwell
R. Maureen Maxwell, Professor of Nursing

Gertrude L. Haussler
Gertrude L. Haussler, Assistant Director of Nursing Service
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CHAPTER I

INTRODUCTION

Temperature taking has long been a part of caring for the sick. DuBois stated that physicians have studied fever since the time of Hippocrates.\(^1\) The thermometer was invented by Galileo in 1593.\(^2\) In 1701 Newton proposed that body temperature be taken as a fixed thermometric point.\(^3\) In 1845 J. Davy did studies on body temperatures and the topography of skin temperatures which led to the acceptance of 98.4 degrees Fahrenheit as the mean oral temperature.\(^4\) The average normal temperature is generally considered to be 98.6 degrees Fahrenheit.\(^5\)

It has been the custom in hospitals to take temperatures on all patients two or more times daily; some patients with fever have their temperatures taken every two hours or oftener.\(^6\) In some


\(^3\)Ibid.

\(^4\)Ibid.


instances temperature taking may become a meaningless routine.\textsuperscript{7,8} Advances in medical science have lessened the importance of frequent measuring of vital processes on patients who are not seriously ill.\textsuperscript{9} Nursing personnel have studied routine temperature taking and have recommended changes. Several such studies are included in the review of literature.

I. THE PROBLEM

Statement of the Problem

The problem of this study was (1) to find the incidence of fever among adult medical patients in the selected hospital, (2) to find the incidence of elevations of 100 degrees Fahrenheit or above after being below 100 for twenty-four hours or longer, and (3) to find what factor or factors, if any, could be used to identify patients with beginning elevations. Factors considered which might be related to the beginning of a temperature elevation were previous temperature pattern, diagnosis or chief complaint, condition of patient, symptoms of fever, and symptoms of a cold.

Purpose of the Study

The purposes of this study were (1) to provide additional


evidence that many patients with normal temperatures were having their temperatures checked several times a day in the selected hospital and (2) to show how patients with beginning elevations could be identified without taking all patients' temperatures more than once a day.

Need for the Study

Two studies reported in nursing literature showed that over 90 per cent of medical patients have normal temperatures. These studies recommended reducing temperature taking to once daily on many patients. At the selected hospital elevated temperatures were found by taking all adult medical patients' temperatures four times daily, at 8 a. m., 12 noon, 4 p. m., and 8 p. m. The nursing personnel at this hospital have felt that many temperatures were being taken unnecessarily as evidenced by a study they conducted on temperature taking. In order for change to take place evidence must be given to support the proposed change; therefore it was felt further study should be given to the situation in the selected hospital.

Limitations

The following were limitations of the study:

Five hundred 8 p. m. oral temperatures of adult medical patients were used.

The temperatures were taken from the daily temperature sheets on nine scattered evenings during the first three weeks of June 1965. Each patient on the unit had his evening temperature taken from one to nine times during the study.
The factors which affect the rate of heat production and heat loss were not controlled.

The effect of the diurnal curve was not considered.

Assumptions

It was assumed that the temperatures as recorded on the temperature sheets and on the charts were reasonably accurate, and that many adult medical patients in the selected hospital do not need their temperatures checked more than once daily.

II. DEFINITIONS OF TERMS

The following terms are defined as they were used in the study.

Fever or Elevated Temperatures

Any temperature of 100 degrees Fahrenheit or above orally was considered a fever in this study. This was the definition used by the nursing personnel at the selected hospital.

Previous Temperature Pattern

The previous temperature pattern was the pattern of normal and elevated periods from admission to the time the temperature was taken from the temperature sheet.

Normal Period

A normal period was one or more consecutive temperature readings below 100 degrees Fahrenheit. The time between the consecutive readings was usually four hours, but sometimes less and sometimes more.
Elevated Period

An elevated period was one or more consecutive temperature readings 100 degrees Fahrenheit or above.

Normal on Admission

If there were no readings on the day of admission of 100 degrees Fahrenheit or above the temperature was considered normal on admission.

Elevated on Admission

If there was one or more readings on the day of admission of 100 degrees Fahrenheit or above the temperature was considered elevated on admission.

Beginning Elevation

A beginning elevation was a reading of 100 degrees Fahrenheit or above occurring after the temperature had been normal for the previous twenty-four hours. Beginning elevations occurring at noon, 4 p.m., or 8 p.m. on the day the researcher was on the unit were seen by the researcher.

III. THE METHOD OF STUDY

The descriptive method was chosen for this study because the research question presupposes prior knowledge of the problem to be investigated. The data were obtained by a survey of temperature

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patterns of adult medical patients at a selected hospital. Five hundred 8 p. m. temperatures were studied and classified according to temperature pattern. Any patients with beginning elevations were studied in more detail to find clues which would have led the nursing personnel to check the temperature if temperatures were checked routinely only once daily.

Steps taken toward the solution of the problem were:
1. Obtaining permission from the Director of Nursing Service to do the study at the selected hospital.
2. Reviewing the literature to determine what studies had been done in this area.
3. Developing a sheet for recording pertinent data.
4. Doing a pilot study to refine the data collection sheet and to gain skill in gathering the data.
5. Gathering, assembling, and analyzing the data.
6. Summarizing the data, drawing conclusions, and making recommendations.

IV. SUMMARY

Because many medical patients need their temperatures checked only once daily, some way was needed to identify patients with the beginning fevers so they would be given prompt treatment if necessary. This is a report of a survey of temperature patterns of adult medical patients and patients with beginning elevations at a selected hospital to show that temperature taking can be done routinely only once a day on many patients.
CHAPTER II

REVIEW OF LITERATURE

Literature was reviewed on (1) the regulation of body temperature, (2) fever, and (3) previous studies concerning the time and frequency of temperature taking.

I. THE REGULATION OF BODY TEMPERATURE

Normal Range of Body Temperature

Different parts of the body have different temperatures. The liver and contracting muscles have higher temperatures than do inactive tissues or the skin. Because of the circulation of the blood and the conductivity and thermal capacity of the tissues there tends to be a temperature gradient of varying steepness from the deep tissues to the skin.¹

Oral or rectal temperatures are used because they can be measured easily and accurately. They are less variable in normal resting subjects than temperatures taken from other parts of the body.² Two factors which cause minor variation of oral temperature are the breathing rate and the loss of heat through the cheeks.³


³Evans, loc. cit.
The normal range of temperature varies with the individual. Because this study is concerned with fever only the upper limit of the normal range is considered. Nordmark and Rohweder, Price, and McClain and Gragg reported 99 degrees Fahrenheit as the upper limit of normal oral temperature.\textsuperscript{4,5,6} Rothweiler, White, and Geitgey gave 99.4 degrees Fahrenheit.\textsuperscript{7} DuBois, who is frequently quoted by others as an authority of body temperature, stated that 99.5 degrees Fahrenheit was the upper limit of the conservative normal range and 100 degrees the liberal but not excessive range.\textsuperscript{8}

The Heat Regulating Center

Neural centers in the spinal cord and lower brain control vasoconstriction, vasodilation, sweating, muscle tonus, and shivering. The hypothalamus (the heat regulating center of the body) seems to coordinate these activities to maintain normal body temperature. The anterior portion controls heat loss; if it is destroyed the body cannot lose heat on exposure to heat and the temperature rises. The

\textsuperscript{4}Madelyn Titus Nordmark and Anne W. Rohweder, \textit{Science Principles Applied to Nursing} (Philadelphia: J. B. Lippincott Company, 1959), p. 120.


posterior portion of the hypothalamus which controls heat production is stimulated by a fall in blood temperature.9

Factors in Heat Loss

Heat is lost from the body mainly through the skin but also through the lungs and excretions. The skin loses heat by radiation, convection, vaporization, and conduction. Temperature and humidity of the air, velocity of air currents, and the temperature of surrounding objects influence the amount of heat lost through the skin.10

Heat loss is prevented voluntarily by clothing, shelter, taking warmed food and drink, and warming the air which contacts the body.11 Involuntary heat loss is regulated by the circulatory system and perspiration.12

Body temperature may be lowered by removal of clothing, cold baths or ice packs, eating ice, and exposure to cold.13

Factors in Heat Production

Most of the heat in the body is produced by oxidation of foods in the tissues. Increased muscular activity increases heat produc-


10Ibid., p. 452.

11Ibid., p. 454.

12Ibid.

13Evans, op. cit., p. 1075.
Usually the increase in body temperature is slight and of short duration. Increased production of heat with a reduced rate of heat loss, such as exercise in hot moist surroundings will raise the body temperature.

The factors which can cause a rise in body temperature are exercise, increase of clothing, hot moist air, hot baths, hot drinks, radiant heat, diathermy, heat puncture of the nervous system, and fevers.

The Diurnal Curve

There is a daily fluctuation of body temperature of one to three degrees. The amount of fluctuation and the times of the lowest and highest temperature vary with the individual. Carlson, Johnson, and Cavert gave two to five a.m. as the time of the lowest and afternoon or early evening as the highest.

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14 Zoethout and Tuttle, *op. cit.*, p. 455.
15 Ibid., pp. 450, 451.
16 Evans, *op. cit.*, p. 1057.
17 Ibid., p. 1075.
22 Ibid.
and Tuttle gave four to six a. m. and eight to ten p. m., and Gib
son, two to seven a. m. and four to eight p. m. Some people have
t heir highest temperature in the early afternoon and others in the
evening. DuBois stated that the diurnal curve shows an inversion
on some people when they begin to work at night and sleep during the
day. Some show no inversion and others a partial inversion. The
diurnal curve seems to be related to metabolism and muscular activ-
ity.

II. FEVER

The Cause of Fever

When the temperature is rising the rate of heat production is
greater than the rate of heat loss; when the temperature is falling
the rate of heat loss is greater than the rate of heat production.
As in normal body temperature there is balance between the heat pro-
duced and the heat lost in a raised temperature. It seems that

23 Zoethout and Tuttle, loc. cit.

26 Robert Banks Gibson, "The Effects of Transposition of the
Daily Routine on the Rhythm of Temperature Variation," The American
Journal of the Medical Sciences, 129:1048, June 1905.

25 N. Kleitman and A. Ramsaroop, "Periodicity in Body Temper-

26 DuBois, op. cit., p. 10.

27 Bernardo A. Houssey and others, Human Physiology (second

28 Evans, op. cit., p. 1058.
fever is caused by a disturbance of the temperature regulating center. It may be said that the hypothalamic thermostat has been set at a higher level. Protein antigens from the breakdown of bacteria or proteins from tissue degeneration (caused by trauma, x-rays, or disease) can reset the thermostat at a higher level.

Fever may be present in clinical conditions caused by infections, diseases of the central nervous system, neoplasms, blood diseases, heat stroke, embolism and thrombosis, disturbances in fluid balance, heart failure, thyroid disease, liver diseases, tissue trauma, peptic ulcer, skin abnormalities, serum sickness and allergy, paroxysmal tachycardia, anesthesia, drug fever, heavy sedation, pyrogens, and psychogenic fever.

**Symptoms of Fever**

Not all textbook sources discussing fever cite symptoms of fever. Six of the sources examined did so. As can be seen in Table I, flushed face, hot dry skin, and delirium are cited by four authors; headache, increased pulse rate, thirst, anorexia, constipation, and scant urine by three; chills, sweating, increased respirations, nausea and diarrhea by two; and furred tongue, eyes bright, anxious expression, vomiting,

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aching all over, and tissue waste by one. Delirium, constipation, diarrhea, and scant urine are symptoms of extreme or prolonged fever. A chill or a shivering attack is common at the onset of fever. The most common symptoms of early fever are chills, flushed face, hot dry skin, headache, increased pulse rate, thirst and anorexia.

The Importance of Fever

The fever curve is useful to show the course of a disease but it is not indispensable. Modell warned against giving it too much emphasis. Before the use of antibiotics the characteristics of the fever were used for diagnosis. These characteristics are still important but a definite fever pattern is not usually established because of early treatment.

The effects of fever, such as sweating and chills, cause discomfort, thus interfering with recovery. Modell suggested that when this is the case, fever should be depressed.

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32 Price, op. cit., p. 461.
35 Guyton, op. cit., p. 963.
36 Modell, op. cit., pp. 297, 298, and 300.
**TABLE I**

**SYMPTOMS OF FEVER ACCORDING TO AUTHOR**

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A&lt;sup&gt;37&lt;/sup&gt;</td>
</tr>
<tr>
<td>Headache</td>
<td>X</td>
</tr>
<tr>
<td>Chills</td>
<td>X</td>
</tr>
<tr>
<td>Increased pulse</td>
<td>X</td>
</tr>
<tr>
<td>Flushed face</td>
<td>X</td>
</tr>
<tr>
<td>Hot dry skin</td>
<td>X</td>
</tr>
<tr>
<td>Sweating</td>
<td>X</td>
</tr>
<tr>
<td>*Delirium</td>
<td>X</td>
</tr>
<tr>
<td>Thirst</td>
<td>X</td>
</tr>
<tr>
<td>Anorexia</td>
<td>X</td>
</tr>
<tr>
<td>Furred tongue</td>
<td>X</td>
</tr>
<tr>
<td>*Constipation</td>
<td>X</td>
</tr>
<tr>
<td>*Scant urine</td>
<td>X</td>
</tr>
<tr>
<td>Increased respirations</td>
<td>X</td>
</tr>
<tr>
<td>Eyes bright</td>
<td>X</td>
</tr>
<tr>
<td>Anxious expression</td>
<td>X</td>
</tr>
<tr>
<td>Nausea</td>
<td>X</td>
</tr>
<tr>
<td>Vomiting</td>
<td>X</td>
</tr>
<tr>
<td>Aching all over</td>
<td>X</td>
</tr>
<tr>
<td>Tissue waste</td>
<td>X</td>
</tr>
<tr>
<td>*Diarrhea</td>
<td>X</td>
</tr>
</tbody>
</table>

*Symptoms of extreme or prolonged fever

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37 MacBryde, op. cit., p. 104
41 Rothweiler, White, and Geitgey, loc. cit.
A chill may increase the burden of the circulatory system, occasionally induce shock, and cause heart failure in elderly patients with heart disease. Insufficient renal circulation may aggravate existing kidney disease.  

High temperature in malignant disease can accelerate weight loss and cause malaise. Elevated temperature in an unconscious patient may indicate pneumonia, wound infection, dehydration, or urinary infection.  

In myocardial infarction a fever can place an extra load on the heart by increasing the rate of metabolism. Patients with myocardial infarctions may have an elevated temperature within the first twenty-four hours. It is usually not over 101 degrees.  

Temperature in fever from any cause rarely goes above 106 degrees Fahrenheit. When the temperature reaches 107 degrees the heat regulating center often loses its ability to promote heat loss. The rising temperature increases the rate of metabolism and because of lowered ability to lose heat a vicious circle is set up which will result

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43 Modell, *op. cit.*, p. 298.
44 MacBryde, *op. cit.*, p. 469.
46 MacBryde, *loc. cit.*
in death unless artificially checked. Body temperatures above 106 degrees cause cells throughout the body to start degenerating.  

Artificially induced fever can be used to treat some infectious diseases. An elevated body temperature of 106 and 107 degrees for several hours will destroy gonococcal or syphilis organisms. Guyton stated that the increased rate of metabolism accompanying fever may allow the cells in the reticuloendothelial system to increase production of immune bodies. Best and Taylor concurred that fever may be an aid in fighting disease. Guyton suggested that fever should not be artificially lowered unless it was above 104 to 106 degrees.

III. PREVIOUS STUDIES CONCERNING TIME AND FREQUENCY OF TEMPERATURE TAKING

Studies Reported in Nursing Literature

The only two studies done since 1965 found on the time and frequency of temperature taking were reported in nursing literature. One study, reported by Schmidt in 1958, was done for a three-week period on surgical, medical and neurological wards. During the study 1,744 of the 1,876 temperatures taken, or over 90 per cent, were normal. Only 53 of the 132 elevated temperatures were over 99.4 degrees

\[49^{Guyton, \text{ op. cit.}, \text{ p. 964.}}\]
\[50^{Ibid., \text{ pp. 176 and 964.}}\]
\[51^{Best \text{ and Taylor, } \text{The Physiological Basis of Medical Practice, \text{ op. cit.}, \text{ p. 742.}}\]
\[52^{Guyton, \text{ loc. cit.}}\]
Fahrenheit. Most of the patients who had these elevations were preoperative and postoperative, newly admitted, or had colds. Previous to this study the routine in the reporting hospital was to take temperatures on all patients at 6 a.m. and at 2 p.m. Upon completion of the study the routine was changed. On the medical unit temperatures were taken twice daily on newly admitted patients for two days, seriously ill patients, patients who had temperature elevations within the previous twenty-four hours, cardiac patients, and those receiving antibiotics. Temperatures were taken only at 2 p.m. on the other medical patients. At the time the report was made the new policy had been in effect for two years and no problems or complaints had arisen.

A similar study reported by Canetto was done on 101 ambulatory patients on the medical unit of the J. Hillis Miller Health Center in Gainesville, Florida. Over a period of a month, 2,234 of the 2,290 temperatures taken, or over 97 per cent, were within the normal range. Thirty-six of the 56 elevations were in 4 patients. As a result of this study it was recommended that ambulatory medical patients have their temperatures checked twice a day for 2 or 3 days after admission and then once daily at 6 p.m. if there was no elevation unless the doctor specifically orders temperatures to be checked more frequently.

A Study in Progress at the Selected Hospital

A study in progress at the selected hospital was done on temper-


ature sheets. Over a two-week period 820 medical and surgical patients were included. The findings reveal a higher incidence of fever in surgical than in medical patients. Most elevations occurred at the 8 p.m. temperature check on both surgical and medical patients. On the 270 medical patients there were twice as many 8 p.m. elevations as at 8 a.m., 12 noon, and 4 p.m. added together.\footnote{Gertrude L. Haussler, Unpublished report, 1965.}

IV. SUMMARY

The heat regulating center of the brain usually keeps the heat loss in balance within the normal range of body temperature. Tissue breakdown or disease may upset the heat regulating center and result in fever. Symptoms of fever are chills, flushed face, hot dry skin, headache, increased pulse rate, thirst, and anorexia. Fever is dangerous when it reaches 106 degrees Fahrenheit or higher. The effects of fever are harmful in some conditions.

Two studies reported in nursing literature recommended reduction of temperature taking to once daily on many patients. A study in progress at the selected hospital showed a higher incidence of fever in surgical patients than medical patients, and a greater number of elevations at 8 p.m. than at the other three times temperatures were taken.
CHAPTER III

THE METHOD OF STUDY, FINDINGS, AND INTERPRETATION OF DATA

The purposes of the study were to provide additional evidence that many patients at this hospital who had normal temperatures were having their temperatures checked several times a day and to show how patients with beginning elevations could be identified without taking all patients' temperatures more than once a day.

Five hundred evening temperatures of adult medical patients were taken from the temperature sheets on nine scattered evenings during the first three weeks of June 1965 and classified according to previous temperature pattern. Four patients with beginning elevations were studied in more detail.

I. METHOD OF APPROACH

Selection of Method

The descriptive survey method was chosen for this study. It was hoped that by making a survey of temperature patterns of adult medical patients and a more detailed study of those patients having beginning elevations a description of patients with beginning elevations could be developed. This would aid in identifying the few patients with beginning elevations without taking all the patients' temperatures several times a day.
The tools, refined in the pilot study, were a data collection sheet and a list of observations for more detailed study of those patients with beginning elevations.

Selection of Facilities

Two medical units of the selected hospital were chosen for this study. The two units had a total capacity of 76 beds. The daily average number of patients whose temperatures were available to the researcher was 56.

Permission to conduct the study was obtained from the Director of Nursing Service. The supervisor of the medical units was contacted and her approval was obtained to conduct the study on her units. Personnel were informed by the supervisor that the researcher would be on the units in the evenings to study temperatures.

II. THE PILOT STUDY

Purpose

The pilot study was done to refine the tools used, to familiarize the researcher with their use, and to assess the number of beginning elevations that were available.

Method and Selection of Patients

Since another study in progress at the selected hospital had indicated there were more elevations at the 8 p.m. temperature check, it was decided to gather the data from the patients and their charts in the evening after routine temperatures had been taken. The pilot study was limited to five evenings on the larger medical unit which
had a capacity of 51 beds. Patients who had beginning elevations when the researcher was on the unit were studied.

Based on the review of literature the data collected on these patients were (1) diagnosis or chief complaint, (2) symptoms of fever, and (3) previous temperature pattern. The researcher also recorded the number of normal and elevated temperatures during this time.

Findings

Of the 174 temperatures available 161 were normal and 13 were elevated. Because no patients had beginning elevations, three patients with continuing elevations were seen by the researcher to give practice in using the check list. Because these patients had continuing elevations no clues were found to aid in identifying patients with beginning elevations. The data collected on these patients comprise Appendix A.

The data collection sheet (Appendix B) was refined to allow for the classification of the normal and elevated temperatures according to previous temperature pattern.

III. COLLECTION OF DATA

The refined data collection sheet was used to record 500 evening temperatures of adult medical patients from the temperature sheets. The data were gathered on nine scattered evenings during the first three weeks of June 1965. Four patients with beginning
elevations were studied in more detail, using the observation check list refined in the pilot study. (Appendix C)

IV. FINDINGS AND INTERPRETATION OF DATA

The 500 evening temperatures were classified according to previous temperature pattern, the data were analyzed, conclusions drawn, and recommendations made.

The Five Hundred Temperatures

As can be seen in Table II, 477 (95 per cent) of the 500 temperatures were normal and 23 (5 per cent) were elevated when taken from the temperature sheets. Three hundred eighty-seven (77 per cent) of the normal temperatures had no elevations in the previous temperature pattern, 9 (2 per cent) had been elevated in the previous pattern since admission until this normal period. Fifty-two (10 per cent) were normal on admission but had been elevated some time in the previous pattern, and 29 (6 per cent) were elevated on admission but had later normal periods in the previous pattern. Of these temperatures that were elevated when taken from the temperature sheets 7 (1 per cent) had been normal in the previous pattern until this elevated period, 2 (less than 1 per cent) had been elevated since admission, 12 (2 per cent) had been normal on admission with other elevated periods, and 2 (less than 1 per cent) had been elevated on admission with later normal periods.

Only 113 (23 per cent) of the 500 temperatures were elevated
**TABLE II**

NORMAL AND ELEVATED TEMPERATURES CLASSIFIED ACCORDING TO PREVIOUS PATTERN

<table>
<thead>
<tr>
<th>Previous Pattern</th>
<th>Normal</th>
<th></th>
<th>Elevated</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Per cent</td>
<td>Number</td>
<td>Per cent</td>
</tr>
<tr>
<td>Normal since admission</td>
<td>387</td>
<td>77.4</td>
<td>7</td>
<td>1.4</td>
</tr>
<tr>
<td>Elevated since admission</td>
<td>9</td>
<td>1.8</td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Normal on admission with subsequent normal and elevated periods</td>
<td>52</td>
<td>10.4</td>
<td>12</td>
<td>2.4</td>
</tr>
<tr>
<td>Elevated on admission with subsequent normal and elevated periods</td>
<td>29</td>
<td>5.8</td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>477</td>
<td>95.4</td>
<td>23</td>
<td>4.6</td>
</tr>
</tbody>
</table>
at any time. The majority of the temperatures (387 or 77 per cent) had been normal since admission.

Table III shows that of the 113 temperatures which showed any elevations 42 were elevated on admission. Thirty-eight of these 42 temperatures were normal when taken from the temperature sheets and 4 were elevated. Seventy-one temperatures were normal on admission but were elevated later. Of these 71 temperatures 52 were normal when taken from the temperature sheets and 19 were elevated.

Table IV shows that 42 (8 per cent) of the 500 temperatures were elevated on admission, 71 (14 per cent) were normal on admission but were elevated later, and 387 (77 per cent) were never elevated.

Unfortunately no other information on the elevated temperatures was obtained. After the data were collected it was approximated from the rough work sheets that the 500 temperatures were on 170 patients. Approximately 75 per cent of these 170 patients had normal temperatures throughout the time the data were gathered. The 113 elevated temperatures were on approximately 40 patients.

**Beginning Elevations**

Only four patients with beginning elevations were seen by the researcher during the time the data were collected. One patient showed a definite worsening of condition at the time of the elevation, indicating a need for a temperature check. Symptoms of fever displayed by this patient were a high pulse rate, increased labored breathing and hot skin. One patient came in with a fever; his temperature was normal for barely twenty-four hours previous to the next
<table>
<thead>
<tr>
<th></th>
<th>Temperature Sheet reading was</th>
<th></th>
<th>TOTAL</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>NORMAL</td>
<td>ELEVATED</td>
<td></td>
</tr>
<tr>
<td>Elevated on admission with or without later elevations</td>
<td>38</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Normal on admission with later elevations</td>
<td>52</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Total showing any elevation</td>
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</tbody>
</table>
### TABLE IV

**TOTALS OF ELEVATED AND NORMAL TEMPERATURES**

<table>
<thead>
<tr>
<th></th>
<th>NUMBER</th>
<th>PER CENT</th>
</tr>
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<tbody>
<tr>
<td>Elevated on admission</td>
<td>42</td>
<td>3.4</td>
</tr>
<tr>
<td>Normal on admission with later elevations</td>
<td>71</td>
<td>14.2</td>
</tr>
<tr>
<td>Normal with no elevations</td>
<td>387</td>
<td>77.4</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>500</td>
<td>100.0</td>
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</table>
beginning elevation. Even though this patient displayed no symptoms of fever his temperature should have been checked more than once daily, as there was an order for medication for fever on his chart and his temperature had been elevated the previous day.

The other two patients who had beginning elevations displayed no obvious symptoms of fever. The temperatures on both these patients were normal at the 4 p.m. check with the first elevated readings occurring at 8 p.m. According to the review of literature these elevations were not high enough to cause harm. Because of the patients' conditions this would seem to indicate that in these cases the effects of fever were not harmful. Although a once daily temperature check at 8 p.m. would have picked these beginning elevations up, the necessity for immediate detection of fever in these cases is questioned.

The data collected on these patients are in Appendix D.

Comparison of Findings with Those of Other Studies

It is difficult to compare the findings of this study with the findings of the studies reported in literature because it is not known what definitions were used for fever in these studies. However, the fact that 95 per cent of the temperatures were normal when taken from the temperature sheets seems to compare with 90 per cent and 97 per cent of the temperatures which were normal in the two reported studies.
V. SUMMARY

After a pilot study a survey of 500 evening temperatures of adult medical patients and a more detailed study of four patients with beginning elevations was done to show that many medical patients could have temperature taking reduced to once daily.

Ninety-five per cent of the 500 temperatures were normal and 5 per cent were elevated when taken from the temperature sheets. Seventy-seven per cent showed no elevations in the previous pattern and were still normal; only 23 per cent showed any elevations either in the previous pattern or when the data were collected. Only four patients were found to have beginning elevations on the evenings the data were gathered.
CHAPTER IV

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

A survey of 500 oral evening temperatures of adult medical patients was made to find the incidence of fever among adult medical patients, to find the incidence of elevations of 100 degrees Fahrenheit or above after being below 100 for twenty-four hours or longer, and to find what factor or factors, if any, could be used to identify patients with beginning elevations.

The purposes of the study were (1) to provide additional evidence that many patients with normal temperatures are having their temperatures checked several times a day in the selected hospital and (2) to show that patients with beginning elevations can be identified without taking all patients' temperatures more than once daily.

A review of literature was done on the regulation of body temperature, fever, and previous studies done concerning the time and frequency of temperature taking. The most pertinent points in the review of literature were:

The hypothalamus controls heat production and heat loss to keep the body temperature at a set level; in fever the heat regulating center is set at a higher level. It is rarely set above 106 degrees Fahrenheit. At this level a fever can become dangerous from the heat itself.
Common symptoms of fever are chills, flushed face, hot dry skin, headache, increased pulse rate, thirst, and anorexia.

The condition of some patients is such that a fever or its effects may retard recovery. Early detection and treatment of fever in these patients is important.

Two previous studies reported in nursing literature recommended reducing temperature taking to once daily on many patients.

A study in progress at the selected hospital has shown a greater number of elevations at the 8 p.m. temperature check than at the other times of routine temperature taking, and a higher incidence of fever in surgical patients than in medical patients.

The tools used to collect the data were a data collection sheet to classify the temperatures according to previous temperature pattern and an observation sheet for the study of patients with first elevations. (Appendixes B and C)

II. FINDINGS

Five hundred evening temperatures were collected on nine scattered evenings during the first 3 weeks of June 1965. Ninety-five per cent of the 500 temperatures were normal and 5 per cent were elevated when taken from the temperature sheets. Seventy-seven per cent showed no elevations in the previous pattern and were still normal; only 23 per cent showed any elevations either in the previous pattern or when the data were collected. There were four patients with beginning elevations during the nine evenings the data were gathered.
There were few beginning elevations. Seventy-one temperatures or 14 per cent had been normal on admission with later elevations, either in the previous pattern or when the data were collected. The number of beginning elevations seen by the researcher was too small to show if there were any specific factors which would identify patients with beginning elevations.

III. CONCLUSIONS

In view of the review of literature and the above findings and within the limitations of this study it was concluded that one would find 90 per cent of the 8 p.m. temperatures on any evening normal. Except on patients whose condition is such that (a) a fever might be harmful, (b) a fever might indicate sudden worsening of the condition, or (c) a fever is suspected, temperature taking could be reduced to once daily on adult medical patients admitted with normal temperatures. Other exceptions to this would be if the doctor ordered temperature taking more frequently or the patient was uncomfortable with symptoms which might accompany fever.

One would expect to find few beginning elevations on any one evening. Too few patients with beginning elevations were seen by the researcher to reveal if there were any factors which would aid in identifying patients with beginning elevations.

IV. RECOMMENDATIONS

Based on the findings of this study it is recommended:
that temperature taking be reduced to once daily at 8 p.m. on adult medical patients admitted with normal temperatures unless their condition is such that the physician and/or nurse feels that an elevation is likely to occur.

that medical patients admitted with elevations be followed throughout their hospital stay to find out if temperature taking can be reduced after the temperature returns to normal.

that a larger number of patients who develop elevations after a normal period be studied to find how to identify these patients.

that surgical patients be studied to find out how soon post-operatively temperature taking can be reduced to once daily.

that a study of fever in disease categories be done to find out how long the temperature remains elevated.
SELECTED BIBLIOGRAPHY
SELECTED BIBLIOGRAPHY

A. BOOKS


**B. PERIODICALS**


C. UNPUBLISHED MATERIAL

APPENDIX A

PATIENT OBSERVATIONS DURING PILOT STUDY

Patient One
1. Diagnosis—chronic low grade fever.
2. Symptoms of fever—anorexia, headache, rapid pulse.
3. Previous temperature pattern—on admission (3 days ago) above 100; previous two days, 98–99.4; today 3 p.m. 100, at 8 p.m. 100.8.

Patient Two
1. Diagnosis—vomiting and nausea, had a cold today.
2. Symptoms of fever—hot dry skin.
3. Previous temperature pattern—up to 100.4 yesterday, previously normal.

Patient Three
1. Diagnosis—epistaxis.
2. Symptoms of fever—headache.
3. Previous temperature pattern—elevated 2nd day, 4th day, and today (5th day).
APPENDIX B

DATA GATHERING SHEET

### NORMAL TEMPERATURES

<table>
<thead>
<tr>
<th>Total each evening</th>
<th>Normal on admission</th>
<th>Normal on admission with later elevations</th>
<th>Elevated on admission</th>
<th>Elevated on admission with later periods of elevation</th>
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### ELEVATED TEMPERATURES

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<tr>
<th>Total each evening</th>
<th>Elevated on admission</th>
<th>Elevated on admission with later normal periods</th>
<th>Normal on admission</th>
<th>Normal with later normal periods</th>
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APPENDIX C

OBSERVATION CHECK LIST FOR BEGINNING ELEVATIONS

CHECK ON:

1. Diagnosis or chief complaint.

2. Condition of patient.
   Pain
   State of consciousness
   Activity allowed

3. Symptoms of fever:
   Chills
   Flushed face
   Hot dry skin
   Headache
   Increased pulse rate
   Thirst
   Anorexia

4. Symptoms of a cold:
   Sore throat
   Cough
   Running or stuffy nose
   Other_________________

5. Any other factors which might be related to fever.
APPENDIX D

OBSERVATIONS MADE ON PATIENTS WITH BEGINNING ELEVATIONS

PATIENT ONE

Diagnosis: Cancer of the lung.

Condition of Patient:

Pain: The patient was sleeping; apparently no pain.

State of consciousness: Prior to the taking of the evening temperatures he was disoriented as to place for a few minutes. He became very excited and his breathing was more labored.

Activity allowed: He was allowed to go out to the patio by wheelchair when ordered by the doctor.

Symptoms of Fever: High pulse rate, skin hot.

Symptoms of a Cold: None.

Other Factors:

The aide reported lower intake than usual prior to the beginning of fever. His temperature had been normal since admission until the 8 p.m. temperature check. This was his 12th hospital day. He expired the next morning.

PATIENT TWO

Diagnosis: Emphysema.

Condition of Patient:

Pain: He had received empirin compound #3 the previous day, shortly after admission. He had received no pain medication since.
State of consciousness: Alert, told the researcher he thought he had the flu as his wife had had it. He was wheezing.

Activity allowed: He was on bedrest with bathroom privileges.

Symptoms of Fever: His face was slightly flushed.

Symptoms of a Cold: None noted.

Other Factors:

There was an order on his chart for aspirin grains X every three hours for fever higher than 102 degrees.

A chest x-ray was done for possible pneumonia—it was negative.

His temperature was 101 on admission the previous day at 4:35 a.m. It was down to 98.4 by 8 a.m. and stayed down below 100 until 3 p.m. when his vital signs were 100-92-24, and at 8 p.m., 100.6-80-24.

PATIENT THREE

Diagnosis: Possible pancreatitis—abdominal pain and nausea for four days.

Condition of Patient:

Pain: None now.

State of consciousness: Alert, stated she was feeling much better.

Activity allowed: Bathroom privileges.

Symptoms of Fever: None.
Symptoms of a Cold: None.

Other Factors:

Her temperature was normal since admission (3 days ago) until tonight at 8 p.m. when it was 100.

The naso gastric suction which was started the day of admission was discontinued today. She has been on I. V.'s but now is on a 800 calorie diet.

PATIENT FOUR

Diagnosis: Cancer of the bladder with partial intestinal obstruction.

Condition of Patient:

Pain: None.

State of consciousness: Stated he felt fine and was hungry.

Activity allowed: Ambulatory.

Symptoms of Fever: None.

Symptoms of a Cold: None.

Other Factors:

His temperature was elevated on admission, then normal until 8 p.m. tonight. He was on I. V.'s; now on a surgical liquid diet.
A SURVEY OF TEMPERATURES
OF ADULT MEDICAL PATIENTS

by

Marilyn Ruth Verabelle Pinder

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

June 1966
ABSTRACT

The problem of this study was (1) to find the incidence of fever among adult medical patients in the selected hospital, (2) to find the incidence of elevations of 100 degrees Fahrenheit or above after being below 100 for twenty-four hours or longer, and (3) to find what factor or factors, if any, could be used to identify these patients.

The study was conducted on the medical units of a selected hospital. Five hundred evening temperatures were taken from the temperature sheets and classified according to previous temperature patterns. Four patients with beginning elevations were studied to find any factor or factors which could be used to identify patients with beginning elevations.

Ninety-five per cent of the 500 temperatures were normal and 5 per cent were elevated when taken from the temperature sheets. Seventy-seven per cent showed no elevations in the previous pattern and were still normal; only 23 per cent showed any elevations either in the previous pattern or when the data were collected.

It was concluded that at 8 p.m. on any evening one would find 90 per cent of the temperatures normal. There would be few beginning elevations. Because of the small number of patients with beginning elevations seen by the researcher no generalizations were made on the factors in their condition which would identify these patients. However, the general condition of two of the patients was such that their temperatures would have been checked more frequently than once daily.