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PATIENT POSITIONING OUTCOMES FOR WOMEN UNDERGOING GYNAECOLOGICAL SURGERIES

AUTHOR:

Hilda Power, RN, BScN, MN, CPN(C). Hilda Power is the Perioperative Coordinator of the Women's Health Program at the IWK Health Centre in Halifax, Nova Scotia.

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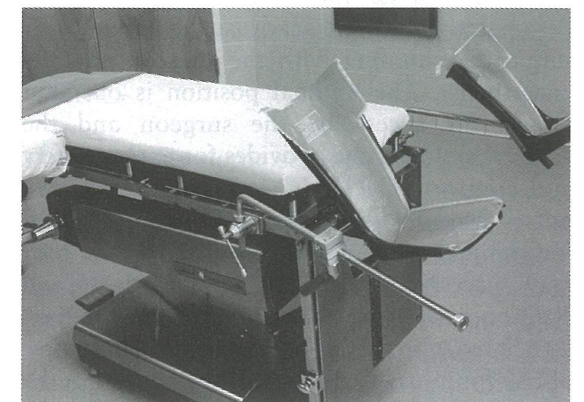
ACKNOWLEDGMENTS

The author wishes to thank *Dr. Lorna Butler* and *Mary Lee-Hebert, RN*, for their contribution during the initial development of the study, and *Lois Sutton, RN* and *Sheila Guile, RN* who identified surgical positioning as an area of practice that required further investigation. I wish to extend a sincere thank you to all of the registered nurses who offered suggestions as to the appropriate process for collecting the data, to the nurses who participated as research assistants and to *Colleen O'Connell* for providing statistical support. The study was carried out between November 1996 and January 2000. *Photographs are courtesy of Joan Porteous.*

ABSTRACT

The purpose of this study was to determine if women undergoing gynecological surgery experienced post-operative pain, separate from surgical site pain, in the lower extremities. The study used a quasi-experimental, comparative, exploratory design. A convenience sample of 153 women, mostly day surgery patients, comprised the study sample. The women were divided into two groups; Group I consisted of women for specific procedures requiring the lithotomy position and Group II consisted of women for specific procedures requiring the supine position. Descriptive statistics were used in the data analysis of the positioning guidelines and pain scale scores. Pearson's Moment Correlations were used to determine relationships among the variables and T-test analysis was used to compare the differences between the two groups.

The study found that 41% (n=63) of the women (N=153) had pain in the lower extremities, separate from incisional site pain, post surgery. Women who were in position for more than 60 minutes had significantly more pain than those who were in position for less than 60 minutes. Of those who reported pain (41%) there was no difference between the supine and lithotomy groups as to the incidence and severity of the pain. Of those in the lithotomy group who reported pain, there was no difference in the reporting of pain based on the type of stirrup used.



Allen Stirrup

DEFINITION OF TERMS

Body Mass Index (BMI), calculated by dividing weight in kilograms by height in metres squared, is a helpful indicator of obesity and underweight in adults. According to the Statistical Report on the Health of Canadians (1999) a BMI of 20-24.9 is defined as a healthy weight. A BMI between 25 and 26.9 confers a "*possible health risk*" and a BMI of 27 or greater confers a "*probable health risk*".

Pain: "*an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage*" (*International Association for the Study of Pain, 1986, P. S217*).

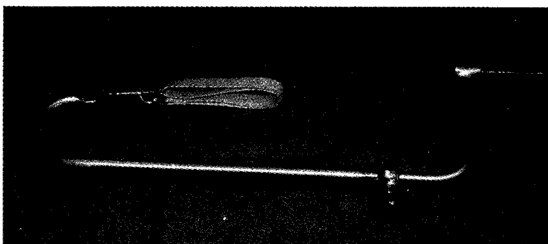
Lower Extremities: Include the lower back and lower abdomen from the umbilical level, the hips, thighs, legs, ankles, and feet (*Gregory Daws & Sileo, 1999*).

PATIENT POSITIONING OUTCOMES FOR WOMEN UNDERGOING GYNAECOLOGICAL SURGERIES

Perioperative nurses share accountability for surgical positioning with the surgeon and the anaesthetist. The optimal position is one that allows for access by the surgeon and the anaesthesiologist and provides for patient safety and comfort (*ORNAC, 1998*). Perioperative nurses need to know the appropriate position for optimal physiological effects so that they may successfully intervene preoperatively and intra-operatively to reduce or eliminate the risks associated with the surgical position. The degree of risk for injury is relative to whether or not the patient receives general or regional anaesthesia, the type and length of surgery, the required position, and the patient's overall condition at the time of surgery. Specific nursing diagnoses that may be applicable to surgical positioning include high risk for impaired skin integrity, high risk for altered tissue perfusion, high risk for musculo-skeletal injury and high risk for ineffective breathing pattern. Although desired outcomes are patient specific, the desired outcome relative to positioning is that the patient should have sustained no injury as a result of positioning (*Spry, 1997, p. 119*). One of the first indicators that an injury has occurred is the patient's post-op report of pain that is unrelated to the surgical site.

Pain is the body's first defense to indicate actual or potential tissue damage (*International Association for the Study of Pain, 1986*). "*Acute pain is associated with tissue damage that begins to decrease as the tissues heal. It is generally of short duration, that is, days to weeks.*" (*McGuire, 1996, p. 335*). The anaesthetized patient is at increased risk related to positional injury because a general or regional anaesthetic prevents the body's normal defense of pain from warning of exaggerated stretching, twisting, and compression of body parts. As a result subsequent damage to nerves and vascular structure can occur without patient awareness. Muscle relaxants further exacerbate the potential for injury by inducing loss of muscle tone and exaggerated muscle relaxation, which interferes with normal defense mechanisms against unnatural or excessive range of motion (*Spry, 1997; McEwen, 1996*).

Surgical positioning may result in postoperative musculo-skeletal pain, joint dislocation, peripheral nerve damage, skin breakdown and cardiovascular and respiratory compromise (*Heizenroth, 1999*). In the supine position areas of the lower extremities exposed to risk include, but are not limited to, the lumbosacral nerve, the sciatic nerve, the common peroneal nerve and the deep peroneal nerve, the skin over the sacrum and the Achilles tendon. In the lithotomy position areas of lower extremities exposed to risk include, but are not limited to, the lumbosacral nerve, the sciatic nerve, the sacro-iliac joints, the skin over the sacrum, the femoral and obturator nerves, the common peroneal nerve, the tibial nerve, and direct pressure to the anterior and lateral compartments of the leg can result in "*compartment syndrome*"



Sims Stirrup

The surgical position poses a risk of injury for the patient but so too does the current health status of the patient. Patients with certain diseases such as diabetes and cardiovascular disease (*McGuire, 1995; Graling & Colvin,1992*) and of a certain weight are at greater risk of injury (*Heizenroth, 1999*). Hence, a preoperative health history to determine the patient's health status and the existence of diseases and conditions is required to ensure the best possible position and support devices necessary to optimize patient out-comes relating to surgical position (*McEwen, 1996*).

PURPOSE AND RESEARCH QUESTIONS

The purpose of this study was to determine if women undergoing gynaecological surgery under general anaesthesia experienced postoperative pain, separate from surgical site pain, in the lower extremities. The supine and lithotomy positions were chosen because those are the positions most frequently used during gynaecological surgeries. There were four questions that the study was to answer. They were:

1. *Do women experience lower extremity pain, separate from surgical site pain, post surgery?*
2. *Is the incidence and severity of pain related to the length of time in position:*

   a) 60 minutes or less or b) more than 60 minutes?
3. *Is the incidence and severity of pain related to the*

   a) supine position or b) lithotomy position?
4. *Is the incidence and severity of pain related to the type of stirrup:*

   a) Allen, or b) Sims?

ETHICAL CONSIDERATIONS

Ethical approval was received at the health centres in which the research was conducted. All participants were informed that their participation was voluntary and their decision whether or not to participate would not affect the quality of health care they received. They were informed that there were no anticipated physical or emotional risks related to participation in the study and that they could withdraw from the study at any time. Confidentiality of the participants was ensured by the coding of all data collection forms. Any publications or presentations would use grouped data.

STUDY DESIGN

In 1996 there were 2500 women per year who underwent general gynaecolgocial surgeries at a large tertiary care centre. Women scheduled for gynaecological surgery comprised the study sample. The intended sample size was 134 women in each position: Group I = lithotomy, Group II = supine. [*This sample size would provide a confidence level of 95%, which means that the significance level would be .05 or less, and a power of 80%.*] The participants would be female between 20 and 50 years of age, speak fluent English, and have a body mass index (BMI) between 21 and 27. Women with prior physical or anatomical injuries to their lower back or legs such as hip pinning, hip replacement, arthritis, plus those with a history of pain in the lower extremities, cardiovascular disease and diabetes were excluded. To facilitate post-op access only women who were having day surgery or short stays (1-2 days) were included.

TOOLS

A verbal descriptor scale (*VDS*) using a pain rating scale of 0 = no pain, to 5 = excruciating pain was used to measure pain intensity. This was chosen because it had the advantages of brevity, ease of administration and completion, and applicability to the type of pain being measured -- acute pain post-op. The VDS has been validated for construct validity and reliability (*McGuire, 1996*). The VDS scale was combined with the various locations (hips,

knees, etc.) to allow each location to be rated for incidence and severity of pain. Researcher-developed scales based on perioperative positioning guidelines for supine and lithotomy positions were also constructed (*see end of article*). These scales were validated for content validity by OR nurse clinicians and educators. Reliability was not tested.

DATA ANALYSIS

Descriptive statistics were used for the positioning guidelines and pain scale scores. Pearson's Moment Correlations were used to determine relationships among the variables and T-Test analysis was used to compare the differences between the two groups. Continuous variables were analyzed using the T-test and categorical variables were analyzed using a Chi-square. Fisher's exact test was used for small numbers where Chi-Square was not a valid test (i.e. positioning guidelines).

ACCESSING PARTICIPANTS

The research assistant accompanied each woman to the OR and observed her being positioned on the OR table. The assistant documented the positioning at the start of, during, and at the end of surgery. The total table time was calculated from the time the woman was placed on the table to the time she was taken off the table. The supine time was recorded as the time the woman was induced for anaesthesia (all patients received a general anaesthetic) to when she was moved off the table. The lithotomy time included time up in stirrups to time of removal from stirrups.

On the third postoperative day the woman was contacted by phone to determine if she had lower extremity pain. If the response was no pain then only that information was recorded. If the response was yes to pain then the woman was asked to complete the rest of the post-test relating to pain location and rating.

RESULTS

One hundred fifty-three women scheduled for gynaecological surgeries comprised the study sample, 103 (67%) of these were day surgery patients. The age range was from 23 - 49 years (average age 35 years), and the Body Mass Index (BMI) range was 20 - 43 (average 25). The top three procedures for the supine position were tubal ligation, abdominal hysterectomy and salpingo-oopherectomy, unilateral. The top three procedures for the lithotomy position were diagnostic laparotomy, laser laparoscopy and vaginal hysterectomy. Of the 153 women involved in the study 63 (41%) women indicated they had pain in the lower extremities, separate from surgical site pain, 90 (59%) women indicated no pain. [*see Figure 1*] Of the 63 who had pain, almost three-quarters of them, 44 (70%), experienced pain on the first day post-op, 16 (25%) women experienced pain on the second day, and 3 (5%) women exper-ienced pain on the third day. [*see Figure 2*] Women who reported pain stated they had pain in the lower back, hips, groins, thighs, knees, or calves. No one complained of pain in the ankles or feet.

Figure 1: Women reporting pain

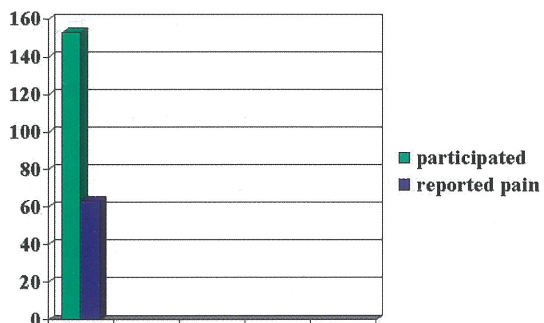
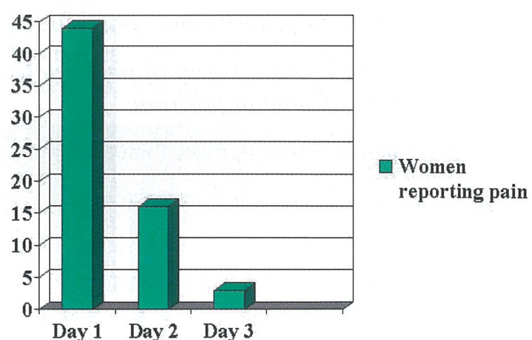


Figure 2: Days post-op & women reporting pain



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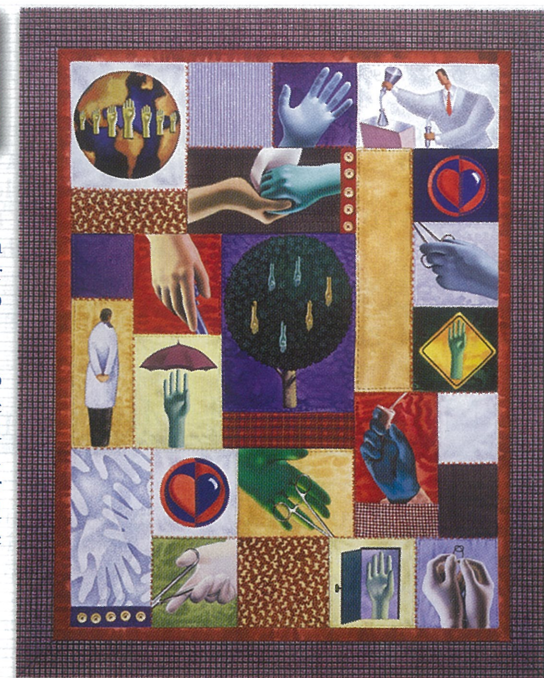

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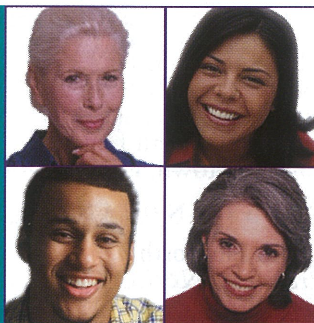

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Figure 3: Location & severity of pain & women reporting pain

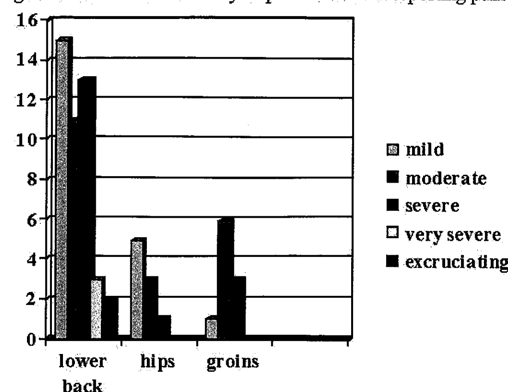
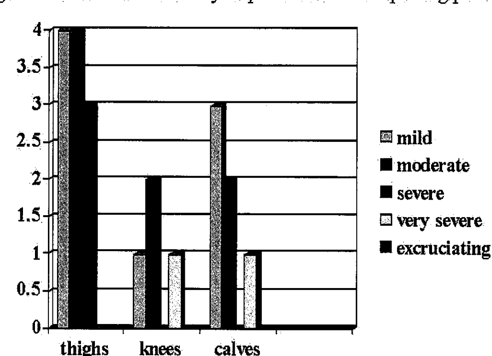


Figure 4: Location & severity of pain & women reporting pain



The women rated the pain for each location on a scale from mild to excruciating [*see Figures 3 & 4*]. The results show that as age increases the severity of pain in the lower back increases and the severity of pain in the hips increases. This is not a surprising finding since we know that the older surgical patient is at a higher risk for injuries (*McEwen, 1996*).

There was a significant difference between those who were on the table for 60 minutes or less and those who were on the table for more than 60 minutes (P = 0.01). Women who were on the table for more than 60 minutes were more likely to experience pain. This was the same for women in both the supine and lithotomy positions. There was no correlation between table times and ratings of pain. The severity of pain was not related to the length of time on the table.

In addition the results show as age increases there is a corresponding increase in table time (P = .003) and as BMI increases table time increases (P = 0.03). The results indicating an increase in table time with the older and heavier patients results will come as no surprise to OR nurses who have noted this occurrence anecdotally. However the researcher is not aware of these results being documented elsewhere in the literature.

Of the 63 women who reported pain there was no significant difference between the incidence and the rating of pain for those who were in the supine position as compared to those in the lithotomy position. There was no significant difference in the number of women reporting pain (P = 0.8) after use of the two different types of stirrups. The severity of pain in the various locations had no relationship to the type of stirrup used.

SUMMARY

This study demonstrated that 63 (41%) of the 153 women having gynaecological surgery experienced lower extremity pain, separate from surgical site pain, even though these women had no preexisting conditions that predisposed them to pain. This finding is consistent with that of *Clarke, Stillwell, Paterson* and *Getty (1993)* who found that patients reported pain whether or not they had a condition that predisposed them to pain.

The women reported pain in the lower back, hips, groin, thighs, knees or calves; no one reported pain in the ankles or feet. The ratings for pain ranged from mild to severe for the hips, groins and thighs, to very severe for the knees and calves. Only two participants reported excruciating pain and this related to the lower back (*one woman was in the lithotomy position and one woman was in the supine position.*) This finding is similar to that of *Graling* and *Colvin (1992)* who found that patients who were in the lithotomy position reported pain in the lower back, leg and hip pain on the second day post-op and the pain in the lower back and hip increased on the fourth day post-op. Whereas in this study a majority of the women who reported pain experienced it on the first day post-op and fewer women reported pain on the second and third post-op days.

Women who were on the table for more than 60 minutes were more likely to experience pain

than women who were on the table for less than 60 minutes. This finding is consistent with that of *Groom* and *Frisch* (*1989*) who found that patients having surgery lasting more than one hour had significantly more pain on day one. They also found that 28% of patients reported lower back pain regardless of position. This study found there was no relationship between type of position and the incidence or the severity of pain. There was no significant difference between the two types of stirrups and the number of women reporting pain. The severity of pain in the various locations had no relationship to the type of stirrup used.

Evaluation of use of the positioning guidelines shows that for the supine position a majority of the guidelines were followed. However, even when the guidelines are not followed, as in the lithotomy position, there appears to be little impact on patient outcome relative to pain in the lower extremities. The only aspect of positioning that directly influences whether or not women experienced pain was when their buttocks were over the table break. This may be explained by the fact that the lower back and buttocks would be exposed to risk of injury from not being supported or having inadequate support.

LIMITATIONS OF THE STUDY

1. It would have been helpful to outline specific procedures that could result in referred pain to the lower extremities. However each patient's response is varied in relation to positioning, as is the case with specific surgeries. It was not possible to discriminate between the type of surgery and the referred pain.
2. The positioning guidelines were not validated for inter-rater reliability (*the strength of agreement made by two or more observers*). Inter-rater reliability would have demonstrated that the guidelines would obtain consistent results when reused.
3. The post-test for assessment of pain did not specify if the pain was continuous or intermittent. This information would have been beneficial in determining the possible cause of the pain.
4. The post-test for assessment of pain did not determine if the patient had taken any analgesia prior to reporting the pain. This information could have had an impact on the actual numbers of patients reportingpain.
5. The confidence level of 95% was set as the level of significance. However the small number of participants (supine = 25, and lithotomy = 128) shows that the study power was 30% not the 80% that was intended. Therefore the ability to detect a difference when one actually exists is limited i.e. difference between the supine and lithotomy positions. This is an important weakness as it is difficult to determine if there is a true difference between groups.

SIGNIFICANCE FOR NURSING

1. The fact that patients with no previous history report lower extremity pain post-op indicates a need for redirecting our focus to following up with patients post-operatively to determine how many do report lower extremity pain. Patient outcomes need to be evaluated for a longer period than several hours post-op as is the situation now with most day surgery patients.
2. Even when positioning guidelines are followed by perioperative nurses, patients may experience negative outcomes such as lower extremity pain. There is a need for a refocus on education relating to positioning and further research is required to isolate the factors that impact on positioning.
3. There is a need for nurses who work in preoperative, recovery, and surgical units to be informed about patients' complaints of pain could relate to their position during surgery. This would enable nurses to inform patients that they may experience lower extremity pain that is related to positioning, not to the actual surgery.
4. There is a need for perioperative nurses to refocus on accurate and ongoing documentation before, during, and after surgery as it relates to assessments and relevant findings. This is important from a patient care perspective in order to accurately reflect

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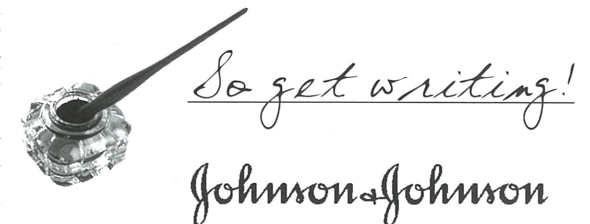

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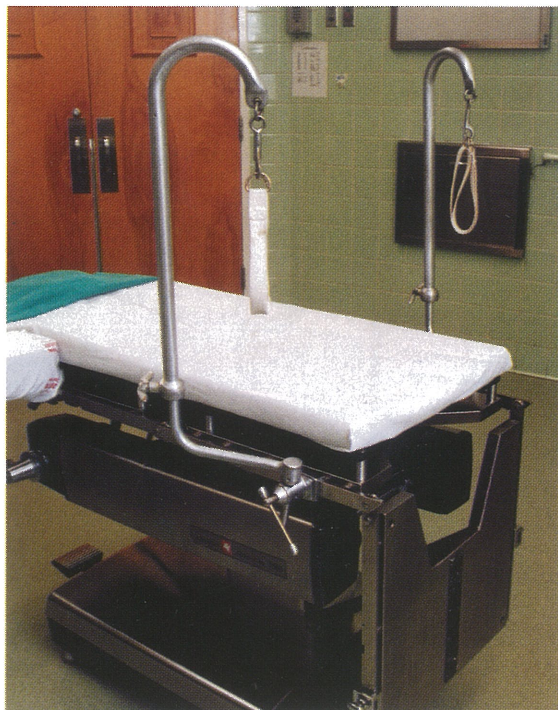
how the patient was positioned, especially if there are negative outcomes and litigation relating to the outcomes.



Surgical Table with Sims Stirrups

CONCLUSION

Positioning the patient for surgery is part of the perioperative nurse's everyday practice. Therefore it is surprising that so little evidence exists to validate the effectiveness of positioning guidelines and outcomes related to positioning. This study provides relevant information that helps address these two important issues. Hopefully it will serve as a building block for future research on positioning relating to women undergoing surgery.

For more information or for a copy of the Simple Descriptive Pain Intensity Scale Post-test, Supine Position Guidelines Data Collection Form, or Lithotomy Position Guidelines Data Collection Form please contact the author at *Hilda.Power@iwk.nshealth.ca*

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