Assistants are used in larger hospitals to accompany the Anaesthetist and patient to the recovery room.

76% responded that both verbal and written charts are used as a means of communication for patient information between the Circulating Nurse and the recovery staff.

Greater than 80% of the responses indicated that the Scrub Nurse has responsibility in observing and reporting activities that could cause injury. 88% indicated the Scrub Nurse is responsible to observe and respond to complications.

Most hospitals agreed, (53%), that the Scrub Nurse performs both roles when additional assistance is required and when there is no surgical assistant.

89% agreed that the Scrub Nurse would perform Scrub Nurse functions as well when performing surgical assistant activities. 96% responded that this would not be considered a 'Transfer of Function" and only 25% agreed that when formulating the "Transfer of Function" activities, operating room nurses were involved in the decisions (ie. small hospitals).

Section D: Future Trends Highlights

66% agreed that they could envision an expanded role of the Scrub Nurse to include that of RN First Assistant.

Only 54% responded that they could see the Circulating Nurse expand its role to that of RN First Assistant to the Anaesthetist. Alberta, British Columbia, New Brunswick, Nova Scotia, and PEI were provinces that responded negatively to this question.

75% agreed that there will be an increase in the role of nurses in the operating rooms of Canada over the next five to ten years.

Comments for an increased role are:

- advances in technology have dictated an increase of the role (ie. laproscopic surgery),
- increased awareness of legalities have developed, therefore, nurses will play a greater role as patient advocates (decentralization),
- aging population will impact,
- increased regulation,
- expand to paramedical fields of anaesthetics and surgery,
- patients will be discharged at a faster rate, giving more time for patient teaching on an outpatient basis,
- as recent cutbacks become more evident, the role of the RN in the OR will expand (new roles will be developed),
- no longer a narrow vision as an instrumentalist, thus going to see a greater role of nursing specialists,
- professional autonomy.

Comments for a decreased role are:

- financial constraints,
- scrubbing will be deleted,
- flattening organization,
- the OR technician brings good value with a more reasonable salary,
- fewer procedures are being covered by OHIP, thus the number of cases will reduce, thus fewer staff,
- nurses are not going into OR nursing as there are few training programs (not part of the basic training, therefore, not attracted to it)

Quotations worth noting:

1. "I believe that the OR nurse's role in Canada is continually growing. This is due to high risk points, modern technology, legislated acts, as well as legal implications".

2. "I envision the OR nurse as a strong patient advocate, a resource person for the surgeon, a specialist in a particular area of surgery and as a teacher/educator of OR nursing practice...".

3. "The role will change dramatically as we move into minimal access surgery, computerization, greater access to patient care information and our ever changing technology. The decreasing health care dollars and aging population will impact and challenge our future dramatically. We must be pro-active, flexible, and prepared to meet the needs of our patients in the context of the complexities of our uncertain future".

A second survey restricted to staff nurses was conducted during the National OR Conference in Quebec City, June, 1993. The results of this survey will be published in a future issue of the Journal. As well, there will be periodic reports on what will be transpiring with regard to the "expanded role" for the operating room nurse.

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Postoperative Complications of Surgical Positioning in the Elderly Orthopaedic Patient

By Regina Leonard

Population demographics indicate that the number of elderly persons in our society is increasing. The elderly share a number of commonalities, including health problems. At present the number of elderly who are accessing the health care system is high compared to other age levels. These clients are requiring more health care treatments, are costing more and are taking a longer time to recover and to exit from the hospital system. The number of elderly who are receiving surgical procedures is increasing (Jackson,1988). This is especially true in the speciality of Orthopaedic surgery where arthroplastic joint replacement and reduction of hip fractures is becoming quite routine. The elderly are also having surgery for limb, shoulder and back injuries and disease processes.

Positioning for a surgical procedure may jeopardize, compromise or disrupt the integrity of the body systems. The systems most frequently affected by the surgical positioning are the peripheral neural, musculoskeletal, integument, respiratory and cardiovascular. The focus for this paper will be on the complications affecting the peripheral neural, musculoskeletal and integument systems. Risk factors present a challenge to the surgical team for all patients. Patients incur some effects from the surgical positions, albeit most of the effects will be minor, expected and transient. Each patient is a unique individual and although some patient needs are universal, there are concerns and problems specific to each patient and at each age level.

The elderly, as a group, pose higher surgical risks than the younger population. They are often physiologically and pscyhologically compromised, have less body fat and muscle tissue to cushion bony prominences, have a slower and sometimes compromised vascular system, have less physiological reserve, are slower to heal and are less responsive to treatment protocols than younger patients. The elderly have decreased tissue perfusion, their health status is often lower, they frequently suffer from more than one medical condition and they may be on multiple medications. They may have impaired communication ability due to medical condition, nutritional status, medications, and the dependent nature of unfamiliar surroundings.

The elderly arthritic patient poses problems in accommodating to the surgical demands on the musculoskeletal system. The obese manifest problems with poor tissue perfusion, a larger expanse of tissue and an uneven distribution of body weight on the OR table. Fatty tissue has decreased vascularity and resiliency which may enhance breakdown of tissue (Iverson, 1988). The aged have decreased skin thickness, vascularity and healing capacity. They have diminished ability to respond to physical and emotional stress and to return to a pre-stress level of

Abstract

This paper addresses the elderly population from the perspective of physiological and anatomical changes which occur throughout the aging process. Recommendations to enhance elderly patient wellbeing throughout the perioperative experience are given including achieving integrity of the body systems, positions used for surgery, and actual and potential problems which may occur as a result of prolonged positions.

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wellness. Recovery takes longer (Latz,1987). Other contributing factors which may impede integrity are the actual age of the patient, the presurgical health status, number of associated medical conditions and overall nutrition (Barangan,1990).

The problems, concerns and precautions for the elderly are different from those of the younger middle aged adult. The complications in the aged differ mostly in their likelihood of occurrence, not so much in the type of complication (Jackson,1988, Latz,1987). The complications of positioning in the OR are similar to those of any unconscious patient (Sullivan, 1985).

Surgical Positions

All disease and rehabilitative states involve some degree of immobility. The function of all body systems is directly or indirectly enhanced by changes in the body position (Milde, 1988). The objectives of surgical positioning are to provide safe administration of anaesthesia, to provide optimal surgical access, to provide patient safety and comfort, to maintain systems integrity and to maintain patient dignity (Leonard, 1992). The position that a patient is in for surgery is decided by the surgeon and based on the procedural access required. The three most common orthopaedic positions used are supine, prone and lateral. Modifications in these positions occur as per the surgical need. For example a modified supine is used for the hip fracture patient and an exaggerated prone, in the kneeling position, is often used for spinal surgery. See **Table 1** for summary of positions, procedures and considerations.

Throughout the literature two main complications are identified as resulting from surgical positioning. They are pressure sores and peripheral nerve injuries. Other, noted but not as frequent, complications are deep vein thrombosis and compartment syndrome. Back pain, stiffness in the limbs and neck, muscle aches and bruising were also identified as expected and transient occurrences from surgical positioning.

Pressure Complaints

It has been shown that 3 to 5% of all hospital patients get pressure sores and skin ulcers. From 12 to 66% of surgical patients get ulcers (Marchette et al, 1991). The etiology of the pressure ulcer is associated with the length of the procedure, decreased perfusion and to vascular surgery. Ulcers may not show till 1 to 3 days post-operatively. There is a likelihood that these ulcers are O.R. related (Scott, 1992). Operating room acquired ulcers are believed to develop from deep to superficial layers. The pressure is believed to originate on the bony prominence in the OR whereas it develops from skin inward in the unit patient (Vermillion, 1990). Immediately post-op the skin may be red and intact. Within 24 hours bruising appears. Up to 6 days later a sacral or other area lesion may manifest itself (internal to external breakdown). Pressure time may include the preoperative, intraoperative and postoperative patient times. Contributing factors to pressure sore development are moisture, skin sheer, negativity (layers of cloth between the patient and the mattress), heat,and patient nutritional status (Scott, 1992).

Risk factors include negativity, increased metabolism, pressure, sheer, time, and anaesthesia (Campbell, 1987). Stretching of muscles can lead to vessel rupture and risk of skin breakdown. Skin pressure decubitii occur from an uneven distribution of body weight which leads to poor- perfusion. Tissue perfusion is a critical factor in pressure sore formation and prevention. Patient blood pressure is a factor as the lower the patient's blood pressure the lower the force required to cause pressure sores (Sullivan, 1985). In the O.R. the patient's pressure is often kept artificially low for the duration of the surgical procedure thus increasing patient susceptibility to pressure injury. In addition, heating pads may be used. These can increase the metabolic need at the pressure points on the pad.

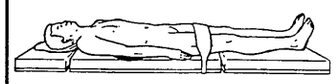
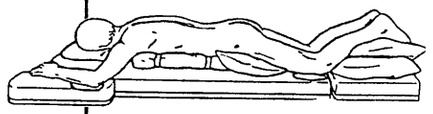
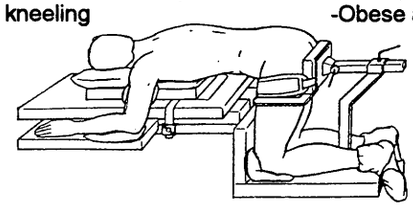
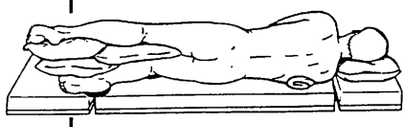
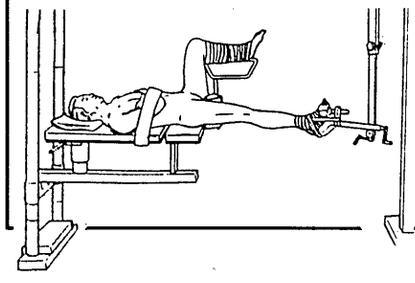
Pressure injury vulnerability increases with length of procedure. In operations longer than 2 hours the probability of pressure injury is stated to be as high as 66%. The chances increase dramatically in the diabetic, the vascular compromised, the hypotensive, the alcoholic, the obese and the elderly (Sullivan, 1985). Fatty tissue is susceptible because of decreased vascularity and resiliency. The sacrum, ischial tuberosity, heels, and malleolus are the most common pressure injury points. Moving and turning the patient frequently preoperatively, intraoperatively and postoperatively may prevent damage (Iverson, 1988). The elderly patient's skin condition and limitations in movement are noted and considered when positioning the patient on the operative table. Adequate supports to accommodate physiological and anatomical changes are applied where appropriate (Jackson, 1989) .

Major factors in predicting skin ulcers in surgical patients are age, tissue vascularity, and time on the operating room table (Kemp, et al, 1990). Trauma, ischaemia, compression, low arterial pressure (Pa), high venous pressure (Pv) and blood flow interuption all lead to skin ulcer potential. There may be compromise after one (1) hour if tissue pressure is greatly increased (Slye, 1991).

Factors influencing the elderly patient's recovery include age, presurgical health, medical condition,

Table 1.

Positions, Procedures and Considerations

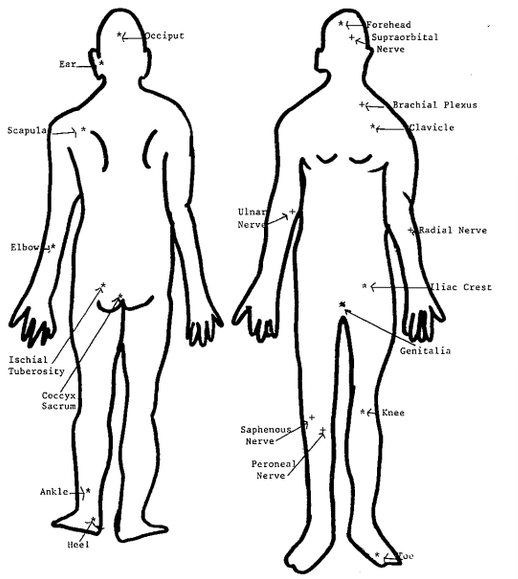
Position	Procedures	Considerations	Comments
Supine 	Extremities Shoulder Pelvis Anterior Body	-Brachial plexus injury from arm abduction > 90 -Radial, Medial, Ulnar Nerve injury -Saphenous, Tibial, Peroneal Nerve Injury -Popliteal Compression -Pressure sore injury to occiput, scapula, vertebrae, olecranon, sacrum, coccyx, etc. Skin pressure injury is the most common complication in the supine position. It is common in the emaciated elderly, the obese, diabetics, and hypotensives. -Lumbar back pain may occur as a result of muscle and ligament relaxation. -Elevation of shoulder may lead to strain on the spinal column and the brachial plexus.	Stretching or compressing the nerve impedes the arterial blood supply to the nerve. This may lead to motor/sensory loss to arms, hands, shoulders, legs or feet. Venous thrombophlebitis may occur from compression. Patient's arms are well padded at the side or secured on arm boards. Head is in straight alignment with rest of body, and legs are secured with thigh strap.
Prone 	Spinal Posterior Body	-Brachial plexus -Shoulder dislocation -Popliteal compression -Skin pressure to iliac crest, knees, toes, ears, face, female breasts, and male genitalia -Low blood flow	Shoulders must be supported, face placed in a face mask or carefully positioned to protect the eyes and ears. The clavicle to iliac crest is supported for diaphragm and lung expansion and the abdomen remains free from pressure. The arms are abducted with elbows flexed, palms down.
Prone kneeling 	Spinal	-Knee pressure -Obese at high risk	Most of the weight is on the knees so careful padding is required. Some redness and tenderness can be expected post-op.
Lateral 	Hip Shoulder Spinal Ankle	-Peroneal nerve -Ear, eye injury -Ankle pressure -Greater trochanter compression, -Neck discomfort -Brachial plexus -Radial artery obliteration	Patient may be placed in a bean bag or may be positioned with pillows, and/or a body frame such as McGuire support frame.
Fracture table 	Hipfracture	-Perineal pressure -Foot constriction -Shoulder pain -Brachial plexus -Fracture site -Sacral pressure -Shearing of affected leg/hip -Genital compression	Peripheral nerve damage is rare with this position. Sacral skin breakdown is a big concern, as is genital injury. Feet are placed in traction boots, perineal post is used to help secure the patient in place and the arm on the operative side is secured over the patient's chest.

Compilation of material by R. Leonard (1993)

Table 1

Potential Body Part Injury in Surgical Positioning

*Common Pressure Points + Peripheral Nerves



Compilation of material: R.Leonard, 1993

nutritional status, medications, etc. Pressure sores can be avoided by altering the patient's position and by passive exercise. Baragan, 1990 notes that few patients recover fully from major hip pinning. For those who do, it takes a long time.

Peripheral Nerve Complaints

Patient positioning for surgery may result in peripheral nerve complications. Peripheral nerve damage is usually due to a mechanical force which causes a disruption to the perfusion of the nerve causing ischaemia and sensory and motor loss to a dependent body part.

The degree of injury is proportional to the severity and the duration of the compression of the compression. The duration plays the most critical role. A constant, low pressure will likely cause more damage than an intermittent heavier pressure. The damage may be transitory or permanent. The pressure may be from an external source such as surface pressure or from an internal source such as bone or muscle. The longer the nerve and the more superficial it is, the greater the chance of injury from an external force (Sullivan. 1985).

Muscle relaxants increase the strain on muscles and nerves. Prolonged stretching of muscle can lead to localized pain, numbness and tingling (Walsh, 1993). Postoperative complaints of numbness, tingling and bruising not associated with the surgical procedure can frequently be traced to intraoperative positioning (Sullivan, 1985). Anaesthestic agents decrease perfusion to bone and tissue and block nerve impulses. Patients can not respond to disruption in normal anatomical position and body alignment while they are in the anaesthetized state.

Brachial plexus injury is the most common injury in the supine position. It may occur from abducting the arm greater than 90 degrees, compression of the plexus by muscle or bone, or from overstretching the patients head to one side. Nerve damage to the upper extremity may occur from compression of the nerve or from misplacement of the arm. The ulnar nerve is a concern in the emaciated and elderly as it can be easily injured from OR table pressure (Sullivan, 1985 , Leonard, 1992). Peroneal nerve damage can occur from the lateral positioning of the patient. This is the most common complication of lateral positioning and affects the leg that is resting on the operating table. See **Tables 1 and 2** for surgical positioning considerations and injury potential.

Compartment syndrome refers to a compression of nerves, vessels and other associated structures within a fascial envelope. This syndrome is not commonly associated with surgical positioning but it can occur in the legs if they have been in stirrups for a lengthy time or in the resting arm of the patient in lateral position. The forearm and the leg are most often affected by a trauma induced compartment syndrome, because of the small compartments in these areas. Signs of compartment syndrome are hypereskesia, weakness, pain on passive stretch, muscle tenseness, increased skin surface pressure. The complication of a fat embolism is most common in pelvic, femoral, tibial, and rib fractures but may occur from any untreated fracture within 24 to 48 hours post fracture (Slye, 1991). Fat embolism and deep vein thrombosis are critical emergencies in the orthopaedic patient. For further information see the attached bibliography for literature.

Eye pressure, supraorbital nerve damage, facial nerve damage, and ear trauma may occur from placement of the head in the face rest or pillow. Urinary retention may be attributed to the anaesthetic, pain or bedrest and may be caused by the oedema of the spinal cord column or from nerve injury (Bryant, 1992).

Documentation

The Operating Room Nursing Record includes documentation of the patient's position for surgery, a listing of the equipment used to position the patient and any deviations and unusual occurrences from the norm. This record provides a reference to the patient's surgical experience and will assist the nurse in assessing the patient's postoperative complaints. Awareness of the position used during surgery can alert the postoperative unit nurse as to potential problems and assist in the identification of patient concerns, thus enabling the nurse to provide effective measures in patient care.

Recommendation

The unit nurse and the O.R. nurse need to work as a team in order to provide continuity of care to the patient. Communication is important and essential between the unit staff and the Operating Room staff. In addition to a full preoperative nursing report the unit nurses should report to the O.R. staff any limitations or discrepancies noted in the postoperative care of the patient, complications identified, concerns related to patient care, and any trends noted in the postoperative patient period. The unit nurse and O.R. nurse may wish to observe in each other's areas the types of care provided and thus internalize the rationale for procedures and elderly patient wellbeing.

Summary

Caring for the elderly patient is becoming the norm on the orthopaedic nursing units. Knowledge of the elderly patient's physiology, limitations, aging process, normal expectations and wellness outcomes is essential in order to give effective nursing care. The elderly patient is not an older version of the middle aged patient. The elderly have unique problems, conditions and needs. The operating room experience for the elderly is more traumatic than for the younger or middle aged patient. A longer recovery time is required for these patients.

Surgical positioning of the elderly should be completed by knowledgeable and skilled operating room personnel. Patients are positioned such that surgery, anaesthesia, patient comfort and dignity can be efficiently, effectively and safely accomplished. The position is dependent on the surgical access required. The elderly patient's limitations are considered and consideration is given to the physical and physiological state of the patient.

Complications can and do occur as a result of surgical positioning. The likelihood of complications is higher in the elderly. The two main complications discussed in this paper were pressure sores and peripheral nerve injuries. The astute operating room and unit nursing team members strive to assess patient needs and to plan and implement safe patient care. Evaluation regarding the elderly patient's concerns and issues is required on an ongoing basis. Communication is essential to providing optimal care.

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Walsh, J. (1993, February). Diagrams used in Table 1: *Positions, Procedures and Considerations.*