Practice guided learning

KEYWORDS SITTING | PRESSURE ULCERS | PRESSURE ULCER PREVENTION | PREVENTIVE TECHNIQUES

Sitting and pressure ulcers 2: ensuring good posture and other preventive techniques

Looking at posture and exploring the range of techniques and equipment that nurses can use to help prevent pressure ulcers in vulnerable seated patients

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This second in a two-part unit on sitting and pressure ulcer development explores posture and prevention techniques. The unit highlights points from Tissue Viability Society (2009) guidance. Part 1 examined the risk factors and potential risks of pressure ulcers in seated patients. It also outlined self-repositioning movements for patients.

INTRODUCTION

It is widely documented that sustained, unrelieved pressure leads to pressure ulcers forming in vulnerable people.

While the use of patient turning and repositioning schedules is an established part of preventive nursing care for those confined to bed, preventive repositioning of seated patients is not routinely recognised.

Given that intense pressures are taken through a reduced surface area when seated, repositioning such patients deserves more attention.

Barbenel et al (1977) found that patients confined to chairs developed pressure ulcers more frequently than those with the same degree of disability who were confined to bed. Some of the most difficult-to-heal wounds occur over the buttocks, with the size and curvature of the ischial tuberosities contributing to the amount of damage in the gluteus muscles (Gefen, 2008).

A neutral sitting posture maintains the three natural curves of a healthy spine: the cervical spine (neck) curves inwards, the thoracic spine (mid-back) curves outwards and the lumbar spine (lower back) curves inwards. The pelvis is upright and level or tilted slightly forward, and the legs are separated 5–8° from midline. The feet should be resting on the floor with the knees and hips bent, usually at a 90° angle.

When sitting, most of the body weight is taken through the buttocks but can be reduced by 12.4% through the use of chair armrests, by 4.4% with the use of a back rest, and by 18.4% when the feet are correctly supported (Swearingen et al, 1962).

Sitting in the neutral position can be uncomfortable or limiting for some, so a good sitting position could be judged to be one from which a patient is able to move and do the activities they want to do to maintain their occupational performance.

Ultimately, it is necessary to limit skin shear forces, frictional abrasion, and peak pressures over bony prominences (see Box 1).

NURSING CARE

A patient’s individual and specific long-term seating needs will change over time, particularly in those with deteriorating neurological conditions who may have absent or partial sensation, and in those with cancer or arthritic conditions who experience pain when sitting.

This is also the case for those with double lower-limb amputation who may have instability issues to contend with, and frail, immobile older people.

Consequently, the diverse patient population and their individual seating needs provide a huge challenge for nurses on wards and in community settings. However, there are some measures that nurses can take in their daily clinical practice to provide preventive care for seated patients.

Sitting posture

One of the most common sites for pressure ulcer development is over the sacrum. The poor posture that nurses can identify associated with this area is when patients sit slumped down in their seat, without using all of the backrest for support, and with their legs quite far out in front of them.

In this situation, it is likely the seat is too deep (long) for them, or the angle of the backrest is too great. This arrangement results in a posterior tilt of the pelvis, which makes patients sit on their sacrum and slide down in the chair to enable them to anchor their feet on the floor. This increases shear forces over the sacrum and the pressure taken through the heels.

Often, when sitting in this position, patients use their hands to hold onto the chair armrests in order to prevent them from sliding out of the chair. This limits any independent activity, such as being able to reach forward

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<th>BOX 1. EXPLANATION OF TERMS</th>
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- **Pressure**: pressure is exerted internally by a bony prominence such as the ischial tuberosity pushing onto the soft tissues. This pressure is then resisted externally by the support surfaces such as the seat or mattress.
- **Friction**: friction occurs at the surface of the skin, for example superficial rubbing of the bed sheets, or when transferring a patient from a wheelchair. Friction can cause superficial skin abrasions in the epidermis which can be painful.
- **Shear**: when shearing occurs, the deeper tissues move across each other and across the bony prominence, while the surface of the skin remains stationary.
Check for clearance behind the knees to avoid pressure and occlusion occurring at the popliteal fossa.

The combination of pressure and shear forces taken at the sacrum increases the likelihood of tissue damage (Bader and Hawken, 1990).

When seated in a chair that is too long, the front of the seat can press against the back of patients’ knees, resulting in occlusion and subsequent lower limb lymphoedema, and pressure ulceration at the popliteal fossa.

Nurses can quickly check if there is adequate safe clearance (approximately 2.5cm) by placing two fingers widthways behind the patient’s knee and the seat (Fig 1). If there is not enough clearance, the use of a back cushion will bring them forwards in the seat, providing clearance at the back of the knee.

It is important to ensure that the patient is not too far forwards and that they still have benefit from the use of the armrests.

For people using a wheelchair, a request to the wheelchair centre-approved repairers can be made to have the seat canvas cut back or replaced to provide the necessary preventive clearance.

Pressure ulceration at the ischii can be avoided by checking patients are sitting with their thighs approximately level with the hips. It is easier to identify from the side view, by seeing if their knees are higher than the hips.

Sitting with the knees higher than the hips substantially increases the peak pressures taken through the ischial tuberosities.

In this situation, the seat is too low for the occupant. Ideally, to rectify this problem, a chair should have the design facility to be adjusted for seat-to-ground height; if not, it may be necessary to change the chair to one that is higher.

In the community, patients’ armchairs can sometimes be raised using seat blocks; this depends on the design of the existing chair legs.

For those sitting in a wheelchair, check they can place their feet on the footplates comfortably. Correct adjustment of footplate height (thighs approximately level) has been shown to reduce peak pressures taken through the ischial tuberosities by as much as 50% (Medical Devices Agency, 1997).

Pressure damage over the trochanteric head can be prevented in seated patients by ensuring that the armrest panels do not press against their hips. Nurses can quickly and easily check optimal clearance by sliding their hands either side of the hips (thumbs pointing upwards, fingers together).

A wheelchair seat that is too narrow can sometimes be spotted by tell-tale scuff marks on the outside of the plastic or metal armrest panels, which are caused by the patient’s hips pushing against the side of the armrests, making them bulge outwards and catch on the wheels during propulsion.

These simple clearance checks and corrective actions will prevent severe tissue damage.

The design of the chair armrests is important. They need to: be at the optimum height for the individual to be able to use them to manoeuvre themselves in the seat; provide support for pressure relief; provide some security for those who are unstable; and help people to safely rise or sit down in the seat.

When used as a support by seated patients, armrests can contribute to the dissipation of pressures taken through other parts of the body. If the armrests are too low, patients may lean down to rest on one side for support, causing pelvic obliquity and increasing pressure taken through just one ischial tuberosity.

Using cushions

Pressure-reducing cushions are often provided with the aim of reducing or redistributing seated pressure.

These are made of foams, gel, air or a
combination of these, and have a wide variety of covering materials (Collins, 2007; Rithalia and Kenny, 2001; Stockton, 2000).

Although many different types are available, there is no evidence that one cushion is better than another in preventing pressure ulcers (McInnes et al, 2008; Cullum et al, 2004).

Importantly, nurses can check the deterioration of pressure-reducing properties of cushions.

If a foam cushion can be easily flattened between the fingers, or if it appears banana-shaped when no one is sitting on it, it needs to be replaced.

Gel cushions that have fluidity, that is, low viscous gels, can also be checked for ‘bottoming out’. Nurses should take the cover off the cushion and look at the gel sacs to see if the gel has been pushed to the outer sides, leaving a flattened centre. The gel sacs should be ‘kneaded’ to encourage the gel to move back throughout the sac before it is replaced back in the cushion ready to retake seated pressures. Additional gel sacs may sometimes be needed.

Air cushions may lose air gradually over time, which reduces the protection offered, so a quick check and adjustment according to manufacturer’s instructions is often the responsibility of the nurse.

Other factors
This is not an exhaustive account of seating assessment and preventive methods for those who spend hours continuously seated.

Beyond the limited posture and seating variables outlined here, there are many other factors that affect patients’ long-term ability to remain free of pressure ulcers. These include such factors as psychosocial issues, cognitive ability, and skill and motivation to transfer and to relieve pressure.

Other considerations are continence management, user and carer opinion on equipment and, importantly, patients’ own perception of comfort when sitting (Stockton and Rithalia, 2009).

CONCLUSION
Nurses can make a clinical difference to preventing pressure ulcers in seated patients by: understanding the role that sitting has in pressure ulcer formation; identifying sitting positions that contribute to tissue deformation; and maintaining seated patients’ occupational performance and quality of life.

For more information on preventing pressure ulcers in seated patients, see the Tissue Viability Society (2009) guidelines and Clark (2009).

REFERENCES