Improved Log-Rolling using Extended-Arm Torque

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Citation

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Abstract

Patients around the world are rolled using \'log-roll\' techniques. However, these are painful to the patient, may cause damage, especially in spinal patients, and are difficult and sometimes dangerous for the nurse or physiotherapist performing the movement. This paper describes a vastly improved method of patient rolling which makes the movement safer and less painful for the patient, and much easier for the staff involved, reducing back strain. The method is for the patient to extend their arms out straight in the direction of rolling, and using the torque applied by their arm weight to roll them. Other log roll techniques are adopted as normal. This method is only applicable in circumstances where the patient is able to safely extend and hold their arms straight for several seconds.

INTRODUCTION

Patients have traditionally been instructed to fold their arms across their chest [$_1$]. This makes rolling harder and more painful. It is far better for the patient to use the weight of their arms to assist in the rolling action, as it reduces the forces that staff must apply and therefore makes the rolling motion safer, less painful, and less controllable. This paper describes the basics of the method, where it is appropriate, and outlines directions for future research into this new technique.

The patient may be lying on their right side, on their back, or on their left side. The following sections detail the two major classes of motion that are used. Rolling in the reverse direction is achieved by a mirror image of the motion.

ROLLING FROM THE LEFT SIDE TO THE BACK

A patient is lying on their left side. The right leg is straightened and the left leg is bent. A nurse lifts the bent left leg. At the same time, the patient extends their right arm behind them as far as they can reach at a comfortable angle. Their left arm is bent across the body but held as far from the body as possible to maximise the torque on the chest in the right-rolling direction. The nurse pushes on the shoulders as normal.

The result is that the arm weight helps the rolling motion due to the fact that the weight of the arm is further to the right. Note that the legs may both be straightened if bending the leg is not appropriate.

ROLLING FROM THE BACK TO RIGHT SIDE

A patient lies on their back. The right leg is straight, the left one bent. The patient extends both arms straight across the body to the right as far as is comfortable. It is important that both arms are straight. Then the nurse controls the motion of the leg and another controls the motion of the shoulders. The extended arms apply a torque on the shoulders as the patient rolls, making the motion much easier and less painful. The use of gravity to apply a torque reduces the force that nurses must apply. Once again, both legs may be straightened if bending the legs is not possible.

DISCUSSION

The method is not suitable in cases where people have serious arm or shoulder problems. However in many spinal operations, leg operations, or any other case where a back problem exists, it will be of great value. Care should be taken to ensure there is sufficient room for the extended arm, and that the patient does not risk shoulder or arm injury through the placement of the arm.

The patient must be able to extend their arms to a useful position where gravity will be able to assist in the rolling motion, and hold this position comfortably for several seconds. If the patient is not able to do this with either or both arms, they should simply fold one or both their arms across their chest as in traditional log rolls.

The method greatly reduces the chance that the patient's spine will be twisted during the process, as it makes rolling

the heavy chest a much easier process. The level of torque that an extended arm can apply is surprisingly high due to the length of the arm in relation to the chest diameter.

CONCLUSIONS

The method of arm-extension rolling is far superior in patients which are able to extend and hold their arms safely for several seconds because the body is more suited to handling torques applied through the arms. This is a minor restriction most cases as patients with spinal or other problems are still usually able to move their arms relatively freely.

Future research will focus upon refinement of the technique, precise identification of the conditions under which it may be used in hospital, home, and physiotherapy clinic situations, and upon its use in emergency medicine.

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