Pressure for beds—does it put our orthopaedic patients at risk?

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Accepted 15 January 2004

**Summary**

Introduction: High occupancy rates of NHS beds has meant that increasing numbers of trauma patients find themselves on non-orthopaedic wards. Nursing staff on these wards may not have the specialist training to nurse such patients and may not recognise complications should they arise. The failure to recognise compartment syndrome was highlighted in a Clinical Governance meeting, leading to an assessment of nursing awareness of this condition. Methods: Fifty orthopaedic trained nurses and a matched cohort of 50 non-orthopaedic trained nurses were asked a series of questions relating to compartment syndrome. Results: The majority of non-orthopaedic nurses failed to recognise the signs of early compartment syndrome. Conclusion: Compartment syndrome is a limb-threatening condition which requires prompt recognition. Patients at risk should be nursed in an appropriate environment.

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**Introduction**

Year on year increases in emergency medical admissions has led to trauma patients being nursed on non-specialist orthopaedic wards. Nursing staff on non-orthopaedic wards either have not received orthopaedic training or maintained their skills; they may not therefore be appropriately skilled to deal with complications specific to musculoskeletal trauma. Although there are many complications that affect the trauma patient, few are likely to be limb threatening. This study aimed to examine nurses’ appreciation of compartment syndrome. Early diagnosis is important as it is eminently treatable if detected early, but has grave consequences if neglected.

**Methods**

A questionnaire was given to 50 nurses on non-orthopaedic wards including acute medical, surgical and sub-surgical specialities. Understanding of compartment syndrome, and more importantly, the early warning signs and symptoms was assessed through a series of six questions (Fig. 1). A matched cohort of 50 orthopaedic trained nurses was asked the same questions. The questions were also designed to identify which warning signs the nurses felt were most important in alerting the orthopaedic team. There were no exclusion criteria or conflicts of interest.

**Results**

Only two of the non-orthopaedic trained nurses could give an adequate definition of the meaning of the term compartment syndrome. Thirty-two
recognised that they should consult with a surgeon early, but were unable to accurately describe the symptoms for which the surgeon should be alerted. Many were reliant on subjective sensations as experienced by the patient rather than key clinical signs.

Forty four of the orthopaedic trained nurses were able to give an accurate description of the term compartment syndrome. Although usually caused by internal injury such as bleeding, post traumatic swelling, tissue trauma and surgery, a similar syndrome can be produced or exacerbated by overly tight dressings or plaster casts. It represents a limb threatening diagnosis.

Compartment syndrome may be suspected clinically, and can be confirmed by measuring the differential pressure (ΔP), which is the difference between the diastolic blood pressure and the tissue pressure. Decompression should be performed if ΔP falls to less than 30 mmHg. It is vital to perform such a decompression early so that muscle ischaemia and necrosis is prevented.

This study demonstrates that non-orthopaedic nurses are unfamiliar with and indeed have insufficient knowledge of compartment syndrome to safely manage trauma patients with significant limb injuries. Whilst most nurses on non-orthopaedic wards were unfamiliar with compartment syndrome, those who were relied on very late findings such as the absence of a pulse before reporting the condition. A missed diagnosis of compartment syndrome is potentially catastrophic for the patient as it represents a limb threatening diagnosis.

It is likely that pressure on NHS beds will continue for the foreseeable future and for this reason orthopaedic patients are likely to be nursed on non-specialist wards. The authors therefore advocate that trauma patients who are at risk of developing compartment syndrome should be treated on dedicated trauma wards and not be placed on general wards where they may not receive the specialist nursing care they require. Failing this, it is essential that non orthopaedic nursing staff receive targeted training in the recognition and management of compartment syndrome.

The following questionnaire is anonymous.

Please indicate if you are orthopaedic [ ] or non-orthopaedic [ ] trained.

What do you understand by the term compartment syndrome?
Tick one or more:
Infection in one part of the body [ ]
Accumulation of a drug in one part of the body [ ]
Increased pressure in an arm/leg compartment [ ]
A psychological disturbance [ ]

What are the symptoms and signs of compartment syndrome?
Circle one or more
Shortness of breath Y N DON'T KNOW
Numbness/tingling Y N DON'T KNOW
Renal failure Y N DON'T KNOW
Depression Y N DON'T KNOW
Anxiety Y N DON'T KNOW
No pulse Y N DON'T KNOW
Pale limb Y N DON'T KNOW
Liver failure Y N DON'T KNOW
Pain on passive stretch Y N DON'T KNOW
Chest pain Y N DON'T KNOW
Fever Y N DON'T KNOW
Disproportionate pain for the injury Y N DON'T KNOW
Cool arm / leg Y N DON'T KNOW

Which do you rate as most important? __________________________
Which should alert you to call a doctor? __________________________
Who is likely to get a compartment syndrome? __________________________
What is the treatment for compartment syndrome? __________________________

Figure 1 Questionnaire.

Compartment syndrome is caused by raised tissue pressure causing ischaemia within a closed muscle compartment. Although usually caused by internal injury such as bleeding, post traumatic swelling, tissue trauma and surgery, a similar syndrome can be produced or exacerbated by overly tight dressings or plaster casts. It represents a limb threatening diagnosis.

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