

We have found several advantages with this technique. First, the closed catheter system can reduce blood exposure during the procedure. Second, this method improves the success rate of catheterisation with real-time pressure monitoring and ultrasonic visualisation. Third, continuous flush fluid from the pressure monitoring system enhances needle tip echogenicity. Finally, the heparin cap at the end of this closed intravascular catheter system can be used to collect arterial blood samples or to inject heparin to reduce thrombotic risks. In conclusion, we report a novel arterial catheterisation technique with a closed intravascular catheter system, real-time pressure monitoring, and ultrasound-guided dynamic needle tip positioning to reduce blood exposure and improve success.

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Declarations of interest

The authors declare that they have no conflicts of interest.

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Anaesthesia workspace layout and intervertebral disc prolapse

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Editor—The association between back injury and some occupations is well recognised. Activities that result in stress upon intervertebral discs are well characterised and include heavy lifting, bending or stooping, twisting and turning, fixed extended postures, and whole-body vibration.¹ All of these result in shearing forces on intervertebral discs and ultimately disc prolapse.

With the exception of whole body vibration, all of the other movements occur frequently throughout during the practise of anaesthesia, and it is surprising that disc prolapse in anaesthetists has not been reported until relatively recently.² The largest report on the problem in anaesthetists is a recent Association of Anaesthetists survey in which 24% of respondents reported symptomatic and radiologically proven cervical disc prolapse.³ Accepting that members with symptoms may have been more likely to respond to the survey, the prevalence seems high in consideration of the incidence in the general population which is reliably 0.5–1% and typically self-limiting in 6–8 weeks.⁴ A recent meta-analysis concluded that cervical disc disease was present in ~17% of hospital specialists described as physically active 'Interventionalists'.⁵ The relationship between disc

problems and occupation was underlined by the fact that hospital specialists whose jobs did not have a physical component exhibited an incidence of disease similar to the general population.

In response to a perceived high prevalence of intervertebral disc prolapse amongst consultants in the Department of Anaesthesia in Sheffield, a recent report analysing the layout of our operating theatres and anaesthetic rooms was carried out. It identified a number of predisposing factors.⁶ The standard of seating was aged, variable in design, and of poor quality. Many of our anaesthesia induction areas were too small to work in comfortably without a lot of twisting and turning movements. The placement of display screen equipment was problematic. Many monitors were placed behind the field of view of the anaesthetist when observing the patient, necessitating frequent twisting and turning movements between patient and screen. Writing surfaces and keyboards were not height and angle adjustable and again may not be aligned with display screens. The layout of equipment was lacking in any standardisation with different layouts even in adjacent areas carrying out the same clinical activities. Many of the components of the

anaesthesia workstation were scattered with no obvious relationship to their function. A sink, gloves dispenser, and paper towel rack might all be on separate walls for example. Of 103 consultants in the department, the prevalence of intervertebral disc prolapse as diagnosed by investigative radiology remains ~15% over several years, and is more common in lower lumbar than in cervical vertebrae.

Guidance issued by the UK Health and Safety Executive on safety in the workplace suggests that activities hazardous to the development of musculoskeletal injury should be reduced as much as possible. This requires careful risk assessment in placement of equipment. Lifting activities should be evaluated by industry-approved moving assessment charts (MACs) to assess the risk of injury from a number of movement activity domains according to posture and distance of any lifted loads from the spine, forces involved, duration of activity, and number of times an activity is carried out.⁷

Management of the airway is a manoeuvre that requires lifting forces well in front of the person intubating. According to MAC tool assessment, this is a hazardous activity for several of the domains considered. In the event of a difficult airway, our concentration to maintain oxygenation of the patient is absolute. It is easy to imagine in these circumstances that posture is compromised. Direct laryngoscopy does not favour well in terms of MAC tool risk assessment with the same problems of lifting some distance in front of the back. Additionally, bending and stooping also occurs to some extent when visualising the larynx. Manikin studies suggest that videolaryngoscopy affords the anaesthetist a better posture than does direct laryngoscopy⁸ and less force is required.⁹ A risk assessment of laryngoscopy purely from the anaesthetist's perspective would appear to favour videolaryngoscopy.

Anaesthetists are not specifically recognised in the guidance in relation to display screen equipment, however our clinical activities, which are increasingly dependent on display screens, fall within the definition of 'heavy display screen users'. Both air traffic controllers and stock exchange traders are defined as 'heavy display screen users', and our use of display screens for continuous monitoring of patients is similar. The placement of display screens should allow for them being both angle and height adjustable and the screen upper surface level with the visual axis of their user.¹⁰ It is also recognised that there is an educational component to safe display screen usage, and users should be checked in their workplace to be sure that their equipment is properly and safely adjusted for them. It is expected that this should be carried out annually in order to monitor and detect musculoskeletal problems at an early stage and make necessary adjustments in equipment or technique.

Recent articles on musculoskeletal problems in hospital doctors recognise the need for further investigation. This is clearly important in arriving at solutions; however, we should not neglect a significant amount of expertise that is already well established from other occupations and for which the UK

Health and Safety Executive has produced a wealth of information and guidance applicable to our specialty. A recent observational analysis of anaesthesia workflow also suggests that poor physical layout of the anaesthesia work station results in unnecessary physical activity.¹¹ Patient safety is our absolute priority, however, our own activities in delivering it should be risk assessed along sound ergonomic principles and arrive at an arrangement which is safe for both staff and their patients.¹¹

Declarations of interest

The author declares that they have no conflict of interest.

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