

anterior displacement of the anterior layer of the thoracolumbar fascia (Fig. 2). This produces reliable dermatomal coverage from T6–7 to L1–2. I am currently conducting a formal clinical comparison between this approach and the transmuscular approach described by Borglum et al. [4].

H. Elsharkawy

Cleveland Clinic,
Cleveland, OH, USA
Email: elsharh@ccf.org

No external funding or competing interests declared. I would like to acknowledge the contribution of Drs. LM Soliman and A. Hadzic to the work presented in this article. All images are taken with permission from Cleveland Clinic art photography department.

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doi:10.1111/anae.13371

Chlorhexidine anaphylaxis: implications for post-resuscitation management

We recently managed a case of chlorhexidine anaphylaxis involving exposure from multiple routes, which has resulted in modification of our 'anaphylaxis management box' to include chlorhexidine-free products for the management of such patients.

A patient with no history of atopy or drug allergy presented for elective general surgery. During the course of general anaesthesia and surgery, the patient came into contact with chlorhexidine during aseptic non-touch cannulation using a single use ChoraPrep Frepp® 1.5 ml Applicator (CareFusion Inc., San Diego, USA), and during surgical skin preparation with chlorhexidine 2% solution. Thirty minutes after induction of anaesthesia, profound hypotension (48/11 mmHg) and tachycardia occurred, which were resistant to ephedrine and metaraminol. The patient's lips and tongue were swollen and there was a widespread erythematous rash. There was no clinical evidence of bronchospasm. Anaphylaxis was recognised and management was delivered according to AAGBI guidelines [1]. A chlorhexidine-coated ARROWg⁺ard Blue® (Teleflex, Amersham, Kent, UK) was inserted after ChloraPrep

Frepp skin preparation, during which further severe hypotension occurred. After cardiovascular stabilisation with inotropes, surgery was completed and the patient was transferred to intensive care unit, but catheterised using chlorhexidine-containing Instillagel® (Farco-Pharma GmbH, Köln, Germany) as a lubricant. The patient's trachea was successfully extubated six hours later, and the patient was discharged the following day.

Blood samples for mast cell tryptase were sent one hour and 24 h after the event. The serum tryptase level at one hour was 45 µg.l⁻¹, falling to 12 µg.l⁻¹ by the following day (normal range 2–14 µg.l⁻¹). The patient was referred to the local allergy clinic using the AAGBI allergy referral form [2], where skin prick testing revealed that the anaphylactic reaction was attributable to chlorhexidine, and all other drugs were excluded.

In this case, despite early recognition of anaphylaxis, the patient was repeatedly exposed to chlorhexidine from multiple sources. Chlorhexidine is the third most common agent linked to allergic reaction associated with general anaesthesia [3].

The AAGBI guidelines for the management of suspected anaphylactic reaction recommends avoiding chlorhexidine and other potential agents (latex, colloids, neuromuscular blockers) when managing patients presenting for emergency surgery who have a convincing history of cardio-respiratory collapse during a previous anaesthetic [1].

Following this incident, our hospital now stocks chlorhexidine-free

central venous catheters [4], single-use isopropyl alcohol 70% wipes for peripheral cannulation, alcoholic povidone-iodine solution for surgical skin preparation and sterile water based lubricant for catheterisation in our theatre ‘anaphylaxis management box’, and we recommend that other units do the same, in the interests of patient safety.

P. Chen

W. Huda

N. Levy

*West Suffolk Hospital NHS Trust,
Bury St Edmunds, UK*

Email: ping.chen2000@yahoo.co.uk

No external funding and no competing interests declared. Written consent for publication was provided by the patient involved.

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doi:10.1111/anae.13372

A painful (mis)connection

Patient-controlled analgesia (PCA) pumps are used in a variety of loca-

tions and managed by different members of staff; therefore, they need to be intuitive to use. We present a situation where we believe that the non-intuitive design of a PCA pump led to suboptimal analgesia.

A thoracic epidural catheter was placed in a patient with multiple rib fractures, to control pain and improve ventilatory function. The epidural catheter was connected to a patient-controlled epidural analgesia pump (Sapphire, Q Core, Netanya, Israel), and was set to give a continuous infusion and patient-controlled bolus doses.

When the patient was reviewed later on the ward, we found that their pain relief was poor. The pump was programmed correctly, and the patient had pressed the demand button many times. However, the pump had not recorded any delivery of local anaesthetic. Examining the pump, we discovered that the patient demand button was plugged into a wrong connection port, resulting in ineffectual button presses. The underside of the pump has three identical ports (Fig. 3). While the patient demand button lead can be inserted into any of the three ports, it will only trigger

a bolus when plugged into port 1, ports 2 and 3 being used for charging and maintenance.

To minimise such errors, we believe the patient button connector and port should have a unique shape and/or size to physically prevent wrong connections, or be clearly labelled. We have informed the Medical Devices Agency of this problem, and would like to invite the manufacturers to comment on whether they could redesign their pump to incorporate these changes.

P. Stennings-Smith

P. Tilakaratna

*Broomfield Hospital,
Chelmsford, UK*

Email: pippass@doctors.org.uk

No external funding and no conflicts of interest declared.

Manufacturer’s reply

On behalf of Q Core Medical, I would like to thank Drs. Stennings-Smith and Tilakaratna for their invitation to reply about this problem.

I can confirm that the current and most updated software version for Sapphire infusion pumps includes on-screen user instructions

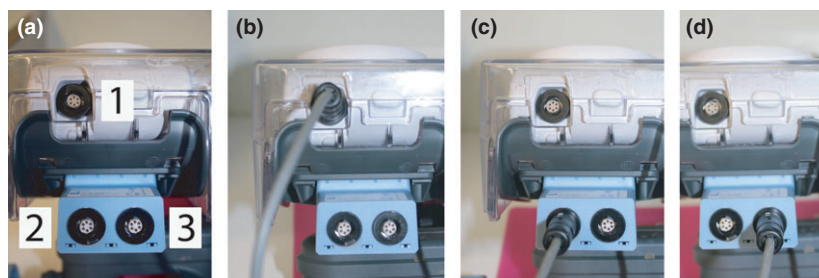


Figure 3 Three identical ports on underside of pump (1,2,3). Button delivers doses only when connected to port 1. Connection to ports 2 and 3 are physically possible, but will not deliver analgesia to patient.