

FIGURE A and B Vygon epidural infusion set with female Luer Lock connector.

References

- 1 Mahajan R. Avoiding the accidental iv injection of local anesthetics (Letter). *Can J Anesth* 2003; 50: 1077–8.
- 2 Favier JC, Da Conceicao M, Fassassi M, Allanic L, Steiner T, Pitti R. Successful resuscitation of serious bupivacaine intoxication in a patient with pre-existing heart failure. *Can J Anesth* 2003; 50: 62–6.

REPLY:

We would like to thank the authors for their interest in our correspondence and for making a couple of points to avoid the accidental iv administration of local anesthetics. We do concur with the authors that “to err is human” and applaud the novel innovation of the Vygon epidural infusion set incorporating an easy Luer adaptor with syringes with a female Luer Lock.

However, we don’t agree with the authors that colour is a too subtle characteristic to be relied upon. Prepackaged plastic syringes with distinct colour of the plunger with both horizontal and vertical flanges are available with Portex™ and B/Braun™ epidural sets.

Colour coding of the syringe labels is recommended by various trials and surveys as a visual alarm to avoid syringe swaps.^{1–3} Although one can overlook or ignore the colour of small labels when in haste,⁴ we firmly believe that there is far less chance of doing so with uniformly coloured plungers, especially when used routinely. However, a formal evaluation assessing the impact of syringes with distinct coloured plungers for epidural use is still awaited.

Prepackaged epidural sets are available without the loss of resistance plastic syringes. Glass syringes are routinely used for this purpose in our institution. If maintained scrupulously, these can be excellent.⁵ Further, the weight of glass syringes is as discernible to the educated hand as is the colour to the eye.⁵

In conclusion, we would reiterate that the feel or pressure of syringe plungers or the colour of the plungers and weight of glass syringes will continue to be reliable safe guards against accidental iv injection of drugs intended for neuraxial administration. However, one can speculate that safety will increase further with the adoption of dedicated connection systems.

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References

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- 2 Radhakrishna S. Syringe labels in anesthetic induction rooms. *Anaesthesia* 1999; 54: 963–8.
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- 4 Fasting S, Givold SE. Adverse drug errors in anaesthesia, and the impact of coloured syringe labels. *Can J Anesth* 2000; 47: 1060–7.
- 5 Armitage EN. Lumbar and thoracic epidural block. In: Wildsmith JA, Armitage EN, Mcclure JH (Eds). *Principles and Practice of Regional Anaesthesia*, 3rd ed. New York: Churchill Livingstone; 2003: 139–68.

REPLY:

We can only agree with LaRosa et al. The solution proposed to avoid the accidental iv injection is effective ...for epidural catheters and lines. Unfortunately, this solution does not exist (in France) for dedicated nerve block needles (neurostimulation). This is why we use dedicated syringes (30 mL syringes in our institution) and specific labelling with grey colour labels (SODIS laboratories, Mulhouse, France).¹

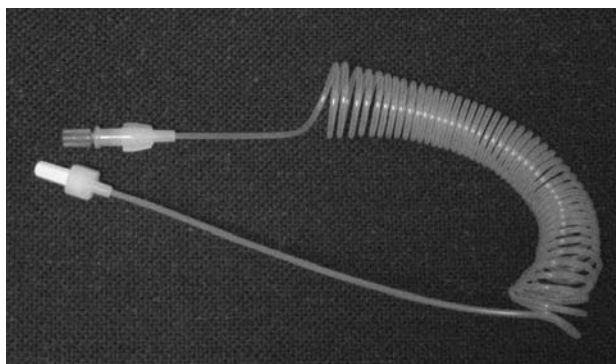


FIGURE Coiled line used for plexus block and epidural infusions.

Thirty millilitre syringes are used for single-shot injections and for the initial injection when a continuous infusion is used (for continuous plexus nerve block analgesia). Unfortunately, the labelled syringe used for continuous infusion is not a dedicated one (30 mL is too small: too frequent changes are needed).

We use dedicated coiled lines as well (Figure, Vygon laboratories, Ecouen, France). These lines are used on plexus nerve block lines and epidural lines in order to avoid the accidental iv infusion of local anesthetics.

In any event, even with these precautions, we agree that: "the quite remarkable capacity for a human to circumvent almost any safeguards against medical error" will persist.

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Reference

- 1 Favier JC. Avoiding the accidental iv injection of local anaesthetics (author reply). *Can J Anesth* 2003; 50: 1077–8.

Are non-depolarizing neuromuscular blocking agents innocuous for the neonates?

To the Editor:

I read with interest the article¹ written by Dr. Littleford and was glad to see she did not make the statement commonly found in most textbooks that the administration of a neuromuscular relaxant does not affect

Apgar or neurobehavioural scores. Partial residual curarization of the neonate can occur when clinical doses of a non-depolarizing neuromuscular blocking agent is used during a Cesarean section despite umbilical vein concentrations lower than the known neonatal EC₅₀ for that specific agent.² In one randomized double-blind study, at 15 min of life, the proportion of neonates with an abnormal neurobehavioural adaptive capacity score was higher in the group whose mothers received an ED₉₀ dose of atracurium (14/25) than in the group whose mothers received an ED₉₅ dose of d-tubocurarine (6/21; $P < 0.05$).² The difference was seen in the active tone category (mode score 7 vs 9; $P = 0.02$) and was statistically significant for active contraction of the neck extensors (mode score 1 vs 2; $P = 0.01$).²

Since the umbilical vein to maternal vein (UV/MV) ratio of non-depolarizing neuromuscular blocking agents varies from 7 to 26% and fetal concentrations will increase with higher injected doses and with longer injection-to-delivery interval for drugs with a high molecular weight, when total avoidance of these drugs before clamping of the umbilical cord is not feasible, using the lowest possible dose of an agent with a low UV/MV ratio and short duration of action appears to be the safest choice.³

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References

- 1 Littleford J. Effects on the fetus and newborn of maternal analgesia and anesthesia: a review. *Can J Anesth* 2004; 51: 586–609.
- 2 Perreault C, Guay J, Gaudreault P, Cyrenne L, Varin F. Residual curarization in the neonate after caesarean section. *Can J Anaesth* 1991; 38: 587–91.
- 3 Guay J, Grenier Y, Varin F. Clinical pharmacokinetics of neuromuscular relaxants in pregnancy. *Clin Pharmacokinet* 1998; 34: 483–96.

REPLY

The cautionary note articulated in Dr. Guay's letter to the Editor¹ has relevance clinically, although one of the assessment tools used to reach the conclusion has been shown to lack validity and reliability.² The Neurologic and Adaptive Capacity Score (NACS) should no longer be used to assess the effect of intrapartum maternal medication on the newborn.

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