The danger with finger tourniquets: Product or Process?
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Whilst we agree with the overall message in the NPSA report [1](including BMJ summary [2]) highlighting the risks associated with digitaltourniquets and the need for regulation, we wish to reiterate the views ofprevious responders and expand with our own concerns relating to thepublication.

We believe there should be a greater focus on the process rather than non-evidence-based products. The process of checking digital tourniquets is fundamentally more important than the type of tourniquet used. Usingbold text in the NPSA briefing sheet has placed an overemphasis on productover process. Imposing a new and unfamiliar product into a surgical procedure without established safety mechanisms has the potential to causegreater harm than no change at all.

We are aware of one near-miss incident in Devon following theintroduction of new unfamiliar CE marked digital tourniquets, asrecommended by NPSA guidance this year. A patient was discharged with afinger tourniquet in situ but was fortunately called back by the surgeon involved after doubts arose a few hours post-procedure. This compares withonly one incident (anecdotally) in the last fifteen years from the same region. If this can occur in a controlled environment, we are concerned about the increased possibility in busy emergency departments or community practices.

We agree with the concerns of Choudhury and Malhas [3] relating tothe geographical locations where digital tourniquets are commonly used.More importantly, we feel there is a greater danger if unfamiliar CEmarked digital tourniquets are used in the community, general practice, podiatry clinics and emergency departments without access to or the ability to carry out two-person checklists such as a modified WHO surgicalchecklist, swab checks and "time-outs". The latest rapid response from theNPSA [4] shows that thought has been given to this issue but disappointingly gives no indication of any suggested procedural changesfor busy, understaffed departments.

There are CE marked digital tourniquets that are clearly not fit for intended purpose (Figure 1 – Tourni-cot). The tourniquets can be skin/pastel coloured and

although designed for safety some have a paper label which can be easily torn off especially when wet. In addition, there is little instructional documentation available on packaging to enable accurate sizing; this may be exerting unacceptably high pressures on digital nerves deep to the tourniquet.

Surgeons are trained to innovate where necessary and continue to do so in many areas of practice with various unlicensed products, featuring widely in many technical note publications worldwide providing ever expanding and improving evidence with which to base modern practice -again, the NPSA has briefly mentioned a few techniques but whilst clearly recognising that there is a lack of evidence they have chosen to promoteonly "intended for use" CE marked tourniquets. Would the authors complain if life saving chest decompression for tension pneumothorax was carriedout (as is standard) using a non-licensed intravenous cannula?

With respect to the use of gloves there is published evidence demonstrating that the pressures are acceptable [5]. Additionally, there are a range of sizes available and assessment of required sizes is much easier than with many CE marked tourniquets. Irrespective of tourniquet type, we have considered safety issues and recommend the use of bright colours and attachment of an artery clip.

In addition to the above, we are disappointed with the one-sided nature of the NPSA report, briefing sheet and poster resource they have provided. The intention to promote safe use is clearly evident however this is overshadowed by an over-emphasised message that the main point ofthe alert is to prevent the use of gloves. In the briefing sheet the authors quote 15 serious incidents between 2005 and 2009; however, the mainreport states that a search was actually carried out from with RLS (Reporting and Learning System) data between 2003 and 2009. This simple omission significantly alters the incidence, adding bias to the argument.The literature review provided in the NPSA report is also biased towards evidence for harm and fails to expand on a number of studies showing evidence of pressure studies including the study by Naim et al [6] cited by Barai et al [7] in their rapid response. The authors might beinterested to read one of a series of BMJ correspondences in 1973 which refers to the use of clear commercially available tourniquets as the focus of litigation [8] - will events repeat themselves with poor CE marked tourniquets?

In summary, we believe that rapid change to surgical practice and equipment has the potential to cause significant harm if applied without due thought to the process. Emphasis on reduction of litigation by makingthe main message "Surgical gloves are not to be used as tourniquets" [1]has taken the focus off the real issue which is the need for due consideration of the process involved. We would argue that a safer alert would have been provided if the main message

was "Do you have an adequate system in place to ensure finger tourniquets are always removed?" We would propose that better guidelines would be: 1. Always use bright coloured materials and 2. Apply a clip from the set, even if a CE marked tourniquet is used. These guidelines ensure safety when used with sensible changes tothe process. The current guidelines have lead to a false sense of securityin theatres where they think they are now complying simply because they nolonger use gloves.

References

1. Rapid Response Report NPSA/2009/RRR007: Reducing risks oftourniquets left on after finger and toe surgery. National Patient SafetyAgency. December 2009.

2. Lamont T, Watts F, Stanley J, Scarpello J, Panesar S. Reducingrisks of tourniquets left on after finger and toe surgery: summary of asafety report from the National Patient Safety Agency BMJ 2010;340:c1981,doi: 10.1136/bmj.c1981 (Published 21 April 2010)

3. Choudhury M, Malhas A. Where (geographically) is the tourniquetbeing applied?? BMJ (Published 13 May 2010)

4. Lamont TJ, Watts F, Panesar S. Safer practice with digitaltourniquets. BMJ (Published 22 October 2010)

5. Hixson FP, Shafiroff BB, Werner FW, Palmer AK. Digitaltourniquets:a pressure study with clinical relevance. J Hand Surg [Am]1986;11(6):865-8.

6. Naim S, Srinivasan MS. Digital tourniquets: a comparative analysisof pressures and pain perception. Acta Orthop Belg. 2008 Apr;74(2):195-9

7. Barai K, Jain R, Srinivasan M. Does evidence confirm CE markeddigital tourniquets are safer? BMJ (Published 3 May 2010)

8. Hoare E. Simple Finger Tourniquet. Br Med J. 1973 August 4;3(5874): 293.