Letter to the Editor:
Superglue in First Aid Boxes

Dear Editors,

In this age of overwhelmed hospital services; a simple home/community intervention can prevent unnecessary and avoidable admittance to the emergency department. An unintended invention, cyanoacrylate (CA) or 'super glue' was patented in 1949 (Ardis, 1949) and deviated from its original use as clear resin for gun sights to an adhesive in wound closure in 1959 (Coover et al., 1959). One of its chemical variations 2-octyl CA was approved by the FDA for medical use in 1998. Other variations include *n*-butyl-2-CA, methyl 2-CA and ethyl 2-CA or household superglue.

Super glue has been used by travelers to mend their wounds when isolated from definitive medical care and can be easily stored in a first aid box (Davis & Derlet, 2013). It reduces the need for supplemental materials such as suture kits. The application of superglue to a wound (Ethicon, 2017) is important to note. It should be applied to wounds where the edges can be easily approximated. Superglue should not be used in patients with a history of allergy to CA, on mucosal surfaces or in wounds with evidence of active infection. However, there is a case report of its successful use on a tongue laceration in a pediatric patient (Kazzi & Silverberg, 2013). Before applying superglue, the wound has to be decontaminated; this can be done by irrigating with sterile water and/or a disinfectant which are present in first aid boxes. If there is bleeding, a sterile gauze from the first aid box with direct compression can be used to achieve haemostasis, prior to application. The super glue should be applied using gloves as there should be no spillage on the applier.

They have been shown to reduce the time for healing cuts, achieve equivalent cosmetic appearance (Quinn et al. 1997) compared to sutures and also have antimicrobial properties (Prince et al., 2018; Romero et al., 2009). In terms of tensile strength, their force is comparable to 5-0 to 6-0 monofilament non-absorbable sutures (Hung et al., 2013).The width of application of CA is crucial to its overall stability as an adhesive. However, adding extra layers through repeated application or to smooth the surface does not increase its adhesive strength (Hung et al., 2013).

Adverse side effects to CA's have been observed; polymerization (hardening) is an exothermic reaction consequently there are issues of them being histotoxic to the dermis (Vinters et al., 1985). Further, this process releases cyanoacetate and formaldehyde, which can act as irritants to the eyes and respiratory tract. As with most topical applicants it may cause contact dermatitis. As long as the film created is intact it will act as a barrier to microbial penetration. This film will naturally slough off in 5-10 days.

With regards to training individuals to administer CA, a product information booklet may be added to the first box. It is not dissimilar from applying superglue for household repairs. However, if the applicator is mindful of not filling deeper structures such as nerve, muscle or bone, there should be no difficulty in applying superglue. A number of clinicians have reported on the use of superglue for acute care settings and likely many more successful repairs outside a hospital setting go unreported (Davis & Derlet, 2013).

After incorporating cost driving variables such as application time, health care worker time, equipment utilization, costs of follow-up visits (to cut sutures), likelihood and costs of wound dehiscence and infection, CA's are a cost effective alternative to sutures (Zempsky et al.,2005). It is also cost reducing and is preferred by patients (Osmond et al., 1995).

Thus, we propose that superglue should find its way in every home/workplace first aid box. It is easily available, affordable, can be comfortably and quickly applied, controls bleeding, is needle free, does not use local anesthetic, functions as a waterproof occlusive dressing and improves wound closure (Soni et al., 2013).

Raghav Bhargava[1*], MBBS

James Henry Arthur Hassall[2], MBBCh

[1]School of Psychology, Cardiff University Brain Research Imaging Centre (CUBRIC), UK

[2]Internal Medicine, University Hospital Llandough, Cardiff, UK

[*]Corresponding Author: Bhargava R, School of Psychology, Cardiff University Brain Research Imaging Centre (CUBRIC), UK. Email- raghavbhargava90@gmail.com

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