



## Description

- “ Haemostatic agent (not a drug).
- “ Chitosan: granular derivative of shrimp shells.
- “ Non-allergenic.

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# Indications and examples of use

- “ Life-threatening emergency bleeding.
- “ Topical (external), not surgical.

## Uses

- “ RTA
- “ Stab injuries
- “ Gunshot wounds
- “ Falls
- “ Penetrating trauma / amputation.





# Celox Granules

“The original product.

“Versatile.

“Pack and press.



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## Applicator

- “ Narrow injuries
- “ Deep
- “ Delivers 6 g granules.



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# Impregnated Gauze

Most popular version.



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## Physical action



Direct contact with bleeding site.

Absorb water – concentrates blood and forms gel.



Granules attract RBC's and platelets (by charge), locking them together in plug.



Pressure allows the gel plug to form on bleed site.





## Using Celox gauze

- “Pack directly to bleed.
- “Maintain pressure 3 minutes.
- “If bleeding persists apply pressure for additional 3 minutes.
- “Bandage.





## Removal

### Granules

- “ Scoop out the gel plug,
- “ Remove any loose surface granules.
- “ Irrigate liberally with saline.



### Gauze

- “ Remove the gauze.
- “ Remove any loose surface granules.
- “ Irrigate liberally with saline.







## Safety

- “ Not thrombogenic.
- “ No heat.
- “ Removable.
- “ Residuals metabolized.
- “ Non-allergenic.





# Coagulopathy

- “ Stops heparinised bleeding.
  - . Also warfarin, plavix, aspirin.
- “ Stops hypothermic bleeding.

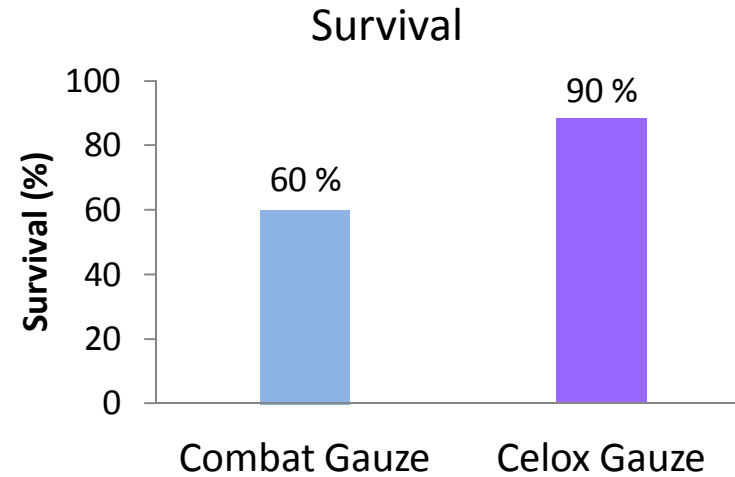
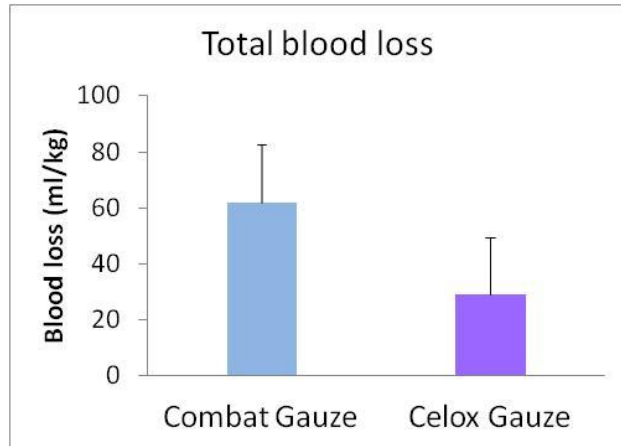




# In vivo performance

Latest US military test.

- “ Highest survival.
- “ Lowest blood loss.



Comparison of novel hemostatic gauzes to Quikclot Combat Gauze in a standardized swine model of uncontrolled hemorrhage. NMRU San Antonio Technical Report #TR-2012-22. Rall JM et al.





# Results

- “ 21 GSW Afghanistan - 100 % <sup>1</sup>.
- “ Gauze cases in civilian and military<sup>2</sup>. No re-bleed.

### Celox (chitosan) for haemostasis in massive traumatic bleeding: experience in Afghanistan

Moreno Pozza<sup>a</sup> and Russell W.J. Millner<sup>b</sup>

The use of Celox, a chitosan-based haemostatic agent, for the control of massive traumatic bleeding in patients arriving at a ROLE 2 (Enhanced Care) Facility in southwestern Afghanistan is described. Twenty-one soldiers with gunshot wounds were treated with successful haemostasis in 18 at the first application and in three after further applications. Celox is an effective haemostatic agent and a useful adjunct for the treatment of massive traumatic bleeding. *European Journal of Emergency Medicine* 00:000-000 © 2010 Wolters Kluwer Health | Lippincott Williams & Wilkins.

*European Journal of Emergency Medicine* 2010, 00:000-000

**Keywords:** bleeding, Celox, chitosans, gunshot wounds, haemostatic agents, trauma

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### Field experience with a chitosan-based haemostatic dressing

1: Pozza M, Millner R, Eur J Emerg Med. 18:31-33 (2011). 2: Tan, Bleeker, MCI Forum 3, September 2011.





## Example cases

- “ **RTA**
- “ **Stab injuries**
- “ **Gunshot wounds**
- “ **Falls**
- “ **Penetrating trauma / amputation.**





## Conclusion

- “ The most effective dressing for immediate haemostasis.
- “ Stops hypothermic bleeding as found in severe traumatic injuries.
- “ No heat, not thrombogenic, residuals resorb.

