



MAG-TQ: TIME SAVED IS LIFE SAVED:

ARTERIAL TOURNIQUET WITH MAGNETIC V-BUCKLE TECHNOLOGY



ENTER

EVERY SECOND COUNTS BUILT FOR RAPID RESPONSE

MAG-TQ		THE NEED		THE CHALLENGE		THE SOLUTION		KEY FEATURES & BENEFITS	PROOF & VALIDATION					ENVIRONMENTAL PERFORMANCE	TRAINING & SUPPORT				CONTACT	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Uncontrolled
haemorrhage is the
Number 1
preventable cause of
trauma death

MAG-TQ is an innovative arterial tourniquet with magnetic v-buckle technology, designed for fast, easy and effective bleeding control when seconds matter.

Built to stop bleeding fast, even in the most challenging and high-pressure conditions: it's durable and easy for one or two handed application, making it simple to use when every second counts.

Rapid application in under 10 seconds* due to the self-locking magnetic v-buckle.

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*Medtrade in-vitro data on file: P2709R Tourniquet Speed of Application

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The Need:

An intuitive device applied swiftly and correctly to control bleeding when every second counts

In a high stress trauma situation, cognitive overload and loss of fine motor skills can mean misapplication, costing lives.

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The Need:

Speed and ease of application is essential, particularly with amputated or partially amputated limbs

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Tourniquets are proven life savers BUT when people struggle physically with the mechanism or don't understand it properly, vital time and function can be lost.

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The Challenge:

Delayed application when trying to loop existing tourniquets around an amputated or partially amputated limb*

Existing models require users to thread the strap through a v-buckle, costing time for medics in high stress situations and exacerbated by loss of fine motor skills in self-application

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Effects of Tourniquet Features on Application Processes Times: Piper Wall, DVM, PhD1; Charisse Buising, PhD2; Alex White3; JaNiese Jensen4; Justin Davis, MD5; Catherine Hackett Renner, PhD6

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The Solution:

Not all tourniquets are created equal: MAG-TQ is effective in the most challenging conditions

MAG-TQ is an innovative arterial tourniquet with magnetic v-buckle technology, designed for fast, easy and effective bleeding control when seconds matter. Rapid application in under 10 seconds* due to the self-locking magnetic v-buckle.

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The Solution:

Built to stop bleeding fast: MAG-TQ provides the time to turn chaos into control

Designed for high-pressure situations: easy to apply with one hand, incredibly durable, and simple to use when every second matters.

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Key Features & Benefits

HIGH-STRENGTH H&L STRAP*

Durable, non-slip H&L Strap designed for quick adjustment and maximum tension retention

ROBUST ALUMINIUM WINDLASS ROD

Precision-engineered, high-grade aluminium windlass rod built for strength and control

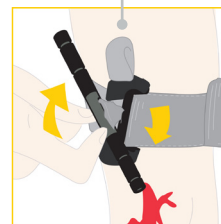


MAGNETIC V-BUCKLE & RELEASE TAB

Innovative magnetic v-buckle system with an integrated release tab

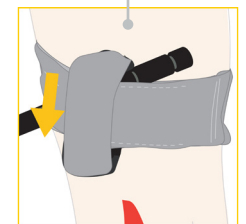
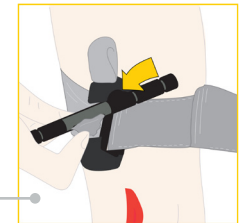
WINDLASS GATE LOCKING SYSTEM

Integrated windlass gate to secure the rod after tightening



TIME TAB

Dedicated write-on 'Time Tab' for recording the exact time of tourniquet application



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* Hook & Loop Strap

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Proof & Validation

Magnetic V-Buckle – Release Tab

P10

High-Strength H&L Strap*	P11
Robust Aluminium Windlass Rod	P12
Windlass Gate Locking System	P13 P14
Time Tab	P15

Rapid, One-Handed Closure with Secure Occlusion Under Load

Innovative magnetic v-buckle with integrated pull-tab release, designed to self-locate and lock without threading.



Magnetic v-buckle integrity maintained under sustained occlusion load (400N for 2 hours)

EVIDENCE FROM TESTING

- Magnetic v-buckle could not be opened under full occlusion force (400N)
- V-Buckle could be opened single-handed when tension was released
- Function verified – 100% of samples passed
- Closure integrity maintained during sustained load testing at >400N for 2 hours

BENEFIT

- Enables rapid, intuitive one-handed application, even with gloves and limited dexterity
- No threading or alignment steps, magnets guide the v-buckle halves together, reducing fine motor demand and cognitive load in high-stress scenes
- Testing confirmed the v-buckle cannot be unintentionally released once therapeutic tension is applied
- Controlled, deliberate release using the pull tab when pressure is removed, supporting safe and fast tourniquet removal in hospital.

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Magnetic v-buckle-maintained closure under occlusion forces of 400N and could be operated single-handedly when not under tension, demonstrating secure locking during haemorrhage control and intuitive release during removal.

* Hook & Loop Strap

Medtrade in-vitro data on file: P2545R Function Testing

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Proof & Validation

Magnetic V-Buckle - Release Tab

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High-Strength H&L Strap*

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Robust Aluminium Windlass Rod

P12

Windlass Gate Locking System

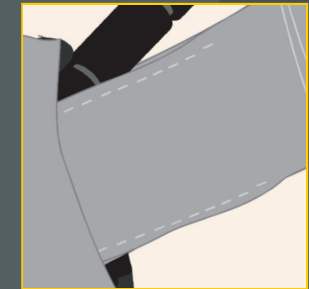
P13 P14

Time Tab

P15

Zero-Stretch Tension Retention for Sustained Haemorrhage Control

Durable, high-strength Hook & Loop Strap engineered for rapid adjustment and maximum tension retention, maintaining structural integrity under full occlusion load.



EVIDENCE FROM TESTING

Elongation testing was performed on production-equivalent tourniquets and the strap subjected to 400N tensile force (representative of arterial occlusion load). The load was maintained continuously for 2 hours with the findings:

- 0% permanent elongation measured in all samples
- No structural damage, deformation, or breakage observed
- Strap dimensions before and after testing were identical

This confirms the strap:

- Does not stretch under therapeutic load
- Does not creep or relax over time
- Maintains applied pressure for the maximum expected duration of use

BENEFIT

Fast tightening and effective re-tensioning: because the strap exhibits zero permanent elongation, tightening force applied via the windlass is not lost to material stretch. This allows:

- Rapid achievement of occlusion
- Predictable re-tightening if additional compression is required
- Stable force transmission throughout prolonged casualty care

Sustained tension without loss of occlusion: the absence of elongation and structural deformation demonstrates that:

- Circumferential pressure is maintained over time
- There is no reduction in applied force due to strap creep
- Occlusion remains stable during transport and extended on-scene care

Consistent performance across limb sizes: by maintaining its original length and mechanical integrity at high load, the strap:

- Supports secure application on a wide range of limb circumferences
- Prevents loosening caused by material stretch on smaller limbs
- Prevents progressive relaxation on larger limbs under sustained compression

* Hook & Loop Strap



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High-Strength H&L Strap supports reliable arterial occlusion from initial placement through transport and handover.

Medtrade in-vitro data on file: P2547R Elongation

MAG-TQ

THE
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PROOF
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PERFORMANCE

TRAINING
& SUPPORT

CONTACT

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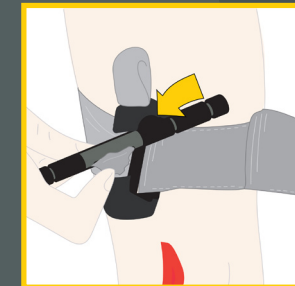
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Proof & Validation

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High-Strength Rotation Without Bending or Structural Failure

Precision-engineered, high-grade aluminium windlass rod designed to generate and withstand full occlusion forces without permanent deformation, cracking, or mechanical failure.



EVIDENCE FROM TESTING

The windlass rod was subjected to worst-case bending and compressive loads that simulate forces during real tourniquet tightening and gate retention.

Central Rod Strength (Occlusion Load Zone)

- Force applied: >400 N at the rod centre
- Average sustained load: ~405 N
- Duration: 30 seconds per test
- Result: No cracking; No permanent bending; No structural deformation; 100% pass rate (6/6 samples)

Conclusion: This replicates the force generated when the internal strap is tightened to full arterial occlusion.

Edge Rod Strength (Gate Retention Zone)

- Force applied: >100 N at the rod edge (safety-factored above calculated in-use loads)
- Result: no cracking, snapping, or permanent bend – all samples structurally intact

Conclusion: This replicates the forces experienced when the rod is captured by the gate and subjected to twisting forces during use.

BENEFIT

Reliable Rotation for Full Arterial Occlusion:

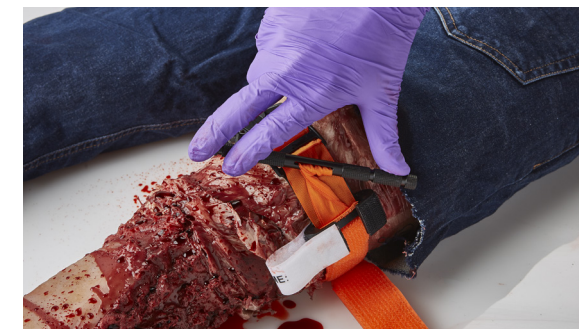
- because the rod withstands >400N at its centre without bending:
- Full windlass rotation can be applied without loss of mechanical efficiency
 - No energy is absorbed by rod flex, so applied torque is converted directly into circumferential compression
 - Occlusion can be achieved quickly and predictably

Resistance to Bending, Cracking, or Structural Failure:

- P2543R demonstrates that the rod:
- Resists permanent deformation at both:
 - The occlusion load zone (centre)
 - The gate retention zone (edge)
 - Shows no cracking or material failure after worst-case loading.

Withstands full occlusion forces without bending, enabling effective torque transmission and reliable arterial occlusion. Also maintains structural integrity under high rotational and compressive loads encountered during tightening and locking.

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* Hook & Loop Strap

Medtrade in-vitro data on file: P2543R – Handle Bend Testing

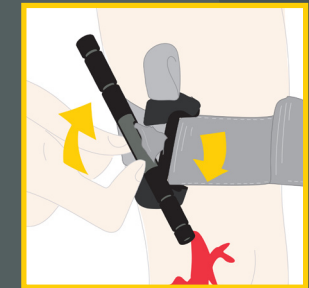
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One-Handed Windlass Locking with Visual and Mechanical Security

Integrated windlass gate that captures and locks the rod after tightening.



EVIDENCE FROM TESTING

Windlass:

- Rotated to occlusion force single-handedly
- Operated with gloves
- Locked into the gate and released single-handedly
- Turned clockwise and anticlockwise to achieve full occlusion

Conclusion: Entire system (windlass, gate, strap, v-buckle, hook-and-loop) maintained >400N for 2 hours without loosening or failure

BENEFIT

- Prevents accidental loosening during patient movement, extrication, or transport
- Visual confirmation of lock rod seated in the gate provides immediate assurance that occlusion is secured
- One-handed locking and release, supports self-application and rapid re-tightening without repositioning hands
- Operational reliability with gloves, ensures consistent performance in cold, wet, or contaminated environments

Windlass and gate assembly demonstrated secure single-handed operation, maintained occlusion force of 400N for 2 hours, and resisted loosening under sustained tensile load.

* Hook & Loop Strap

Medtrade in-vitro data on file: P2545R Function Testing

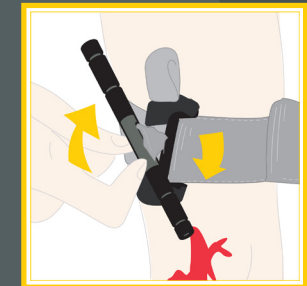
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One-Handed Windlass Locking with Visual and Mechanical Security

High-strength windlass rod designed to resist bending and deformation while being held in the gate under load



EVIDENCE FROM TESTING

Rod (Occlusion Load Zone)

- Withstood >400 N bending/compressive force
- No cracking, permanent bending, or failure.

Rod Edge (Gate Retention Zone)

- Withstood >100 N edge load (safety-factored above calculated in-use forces)
- No permanent deformation or damage.

Testing simulated worst-case force paths

- Central loading from strap tension.
- Edge loading where the rod is captured by the gate during tightening and holding.

BENEFIT

- Rod will not bend, snap, or permanently deform while locked in the gate.
- Gate-rod interface is structurally safe under occlusion and user-applied forces.
- Locking system remains mechanically reliable even under worst-case loading.

Rod Centre and Rod Edge demonstrate robust construction, both withstanding simulated worst-case scenario testing.

* Hook & Loop Strap

Medtrade in-vitro data on file: P2543R Handle Bend Testing

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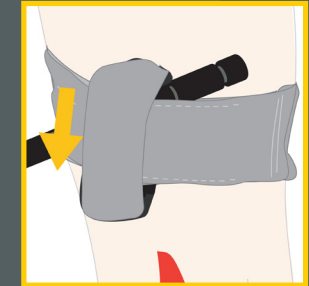
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Time Tab

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Clear, Durable Time Recording for Trauma Handover

Dedicated write-on 'time tab' for recording tourniquet application time.



EVIDENCE FROM TESTING

Time tab and main strap

- Successfully written on with permanent marker
- Remained clearly legible across all samples
- Passed functional and durability inspection

BENEFIT

Supports trauma best practice by enabling precise documentation of tourniquet time-on

- Improves handover communication from pre-hospital to ED, theatre, and ICU teams
- Reduces risk of prolonged ischemia by making time of application immediately visible
- Integrated into the device - no additional tags or labels required

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Time tab and strap demonstrate suitability for permanent marker writing, with legible time recording across all samples, supporting clinical documentation and continuity of care.

* Hook & Loop Strap

Medtrade in-vitro data on file: P2543R Handle Bend Testing

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Training & Support

Introduction

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This section includes written **Instructions for Use** with diagrams and **Training Videos**

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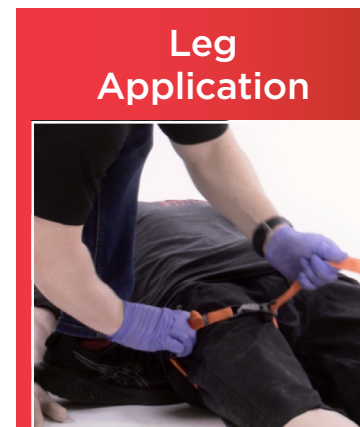
To see a video of the **MAG-TQ** being applied by an instructor, click the relevant image.



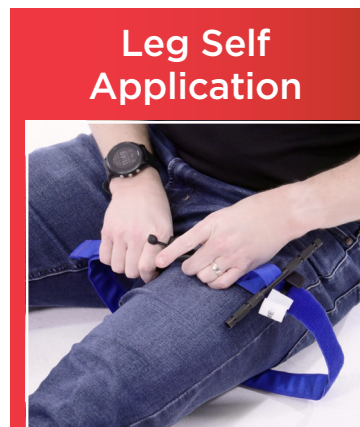
Arm Application



Arm Self Application



Leg Application



Leg Self Application

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For further information on any of our products:

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See our website **celoxmedical.com**

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