

# Press Invitation: Try out Suturing (Medical Stitching) using a Zeus Medical Robot at Sutrue's Automated Suturing Devices Announcement

Submitted by: Sutrue Ltd  
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Sutrue, creators of cutting edge medical technology, have created two new devices which are set to transform the suturing process and potentially save the NHS millions of pounds each year. The devices are a Handheld Suturing Device and Endoscopic/Robotic Suturing Device. They offer medics an alternative to hand stitching and were created by utilising 3D printing.

You are invited to attend Sutrue's press announcement on 30th May 2018 and be among the first people in the world to create automated robotic stitches using a Zeus medical robot and the Sutrue Robotic Suturing Device. The event will also include an inspirational Q&A with a panel of thought leaders involved in the design, engineering, testing and patenting of the device. You will have the opportunity to compare sutures produced by the handheld suturing device with those produced through traditional hand stitching. Additionally, you will have the chance to view the device at the museum's 'Designer Maker User' exhibition.

Sessions run from 11.00 – 13.30 or 14.00 – 16.30 at the Design Museum, 224 – 238 Kensington High Street, London, W8 6AG.

RSVP to [Thea@sutrue.com](mailto:Thea@sutrue.com) by 21st May indicating which session you will be attending. Places allocated on a first come first serve basis.

The technique for producing medical stitches hasn't changed since the times of Ancient Egypt – until now. Medical stitching by hand can be problematic as it relies on the ability, dexterity, training and alertness of the practitioner. Sutrue Ltd has solved this historic problem through the creation of two revolutionary automated stitching devices. They transform the manual process of stitching into a far simpler, quicker and more accurate automated process, thus reducing the margin for human error. There have been over 10,000 patent attempts to produce a device that sutures wounds and Sutrue is the first to successfully achieve it.

**Benefits of the Handheld Suturing Device over traditional suturing include:**

- The potential to save the NHS £10.7 million a year (based on data from 'Health Economics Assessment of an Automated Suturing Device within the NHS' by York Health Economics Consortium)
- Safer, quicker and more accurate than suturing by hand
- Increased needle force and the option to reduce needle size to subsequently reduce tissue trauma/scarring
- Ability to use standard suturing needles from different suppliers
- Reduction of needle stick injuries among healthcare practitioners and therefore fewer cases of high risk infection such as HIV and Hepatitis B
- Procedures can be performed in the field by less skilled users resulting in injuries being treated more quickly

**Benefits of using the Suttrue Robotic/Endoscopic Suturing device in robotic surgery instead of using forceps include:**

- Reduction in number of open operations and increase in keyhole surgery
- Increased speed of suturing. In endoscopic surgery an experienced surgeon can take up to 25 seconds per stitch, whereas our device can produce a stitch in 1/3 of a second
- Increased access to hard-to-reach places using the articulation of the device
- Increased accuracy of suturing due to reduction of human error. This is particularly relevant in relation to cosmetic surgery and internal surgery where movement is limited

To create their unique suturing mechanism, Suttrue produced 38 different prototypes and designed and tested over 1,500 parts, which involved 15,000 hours of design work. This resulted in the creation of a patented automated suturing mechanism that now consistently works across both types of devices – the Handheld and the Endoscopic/Robotic.

Both types of devices can produce a row of sutures, tie a knot and sew around a corner. Their ability to do this means that they have numerous significant benefits within medicine, in addition to the handheld device having a wide range of industrial applications. The creation of these devices has been a feat of engineering that has used modern 3D printing capabilities to impact the future of medical research and development.

#### MEDICAL

##### ROBOTIC/ENDOSCOPIC DEVICE:

For over eight years Suttrue has worked closely with Mr Richard Trimlett (Cardio-thoracic Surgeon and Head of Mechanical Support at the Royal Brompton Hospital) on the creation of both devices. Richard sees the Robotic/Endoscopic Device as being influential to the future of robotic surgery. He believes that the device could help to significantly reduce the number of open operations undertaken in the future as it enables sutures to be carried out endoscopically, thus removing the need to 'open up' a patient. He stated:

"It's true to say that the majority of operations we're doing today are still open and that's not because the patient wants them open, it's because of the limitations of the technology and so there are many improvements to technology that we need to get to the point where we can do everything as a keyhole operation and I see this as one of them".

The potential applications of the device include all forms of robotic surgery, but particularly the following areas:

- Cardiac
- Thoracic
- Cranial
- Gastrointestinal

## HANDHELD DEVICE:

Sutruie has worked with several influential medics during the development process of their suturing devices, including Professor John Pepper OBE, Professor in Cardiothoracic Surgery at the National Heart and Lung Institute who believes the handheld device will benefit inexperienced medical staff when closing wounds. He stated:

“[The Sutruie handheld device] is less likely to cause tissue damage and inexperienced operators often cause tissue damage without realising it, particularly in general surgery for example, whilst doing routine parts of general surgery, like closing the wound and the layers of the wound. It’s important, yet often delegated to the most junior person and tissue damage there can lead to wound breakdown, infection, haematomas and so on.”

Potential applications include:

- Hospitals
- Field hospitals
- Veterinary
- Dentistry
- Extreme environments (e.g. in space)
- Manufacturing
- Textiles industry

## ENGINEERING

The engineering process involved in the creation of the Sutruie devices has been significantly faster than traditional methods due to the use of cutting edge 3D printing technology provided by GE Additive. Alex Berry, MD of Sutruie, stated:

“Rapid prototyping has significantly reduced the cost of the creation of the devices, probably by a factor of 50. It has also shaved years off the time it would have otherwise taken. We’ve taken a ‘create, print, test, tweak, reprint’ approach to solving the problem. We even coined our own term for the working process and called it ‘Multi-typing’, which is the ability to loosely design the same component in three or four different ways, have them printed within a few hours and then test and learn from each prototype. This approach has been instrumental in allowing a small start-up company like ours to maximise our output in terms of creativity and problem solving”.

## 3D PRINTING

Concept Laser – now a part of GE Additive - has been working with Sutruie for almost three years with the printing of the very small and detailed parts that the automated suturing devices require.

“By using the high-resolution capabilities of our Mlab cusing R 3D printer, Sutruie has been able to successfully speed up the engineering process involved in the creation of their medical devices, through a process called Rapid Prototyping,” (said Stephan Zeidler, business development manager for the

medical sector at Concept Laser).

"Once designed by Sutrue, the structurally superior parts were printed by our team before Sutrue assembled them into numerous medical prototypes - sometimes straight from our printer with minimal post processing. This in turn saved considerable time and cost and has resulted in the completion of a series of fully-functioning medical prototypes. Sutrue's success in having achieved this is a fantastic example of what is possible with our DMLM machines and additive manufacturing technology. We are delighted that both devices are now mechanically sound and are ready for testing within medical industry," (Zeidler continued).

## PATENT LAW

Doctor Tom Burt (Chartered UK and European Patent Attorney, Patent Attorney Litigator at Abel & Imray) has been working with Sutrue on the legal side – patenting the mechanism. He commented on the considerable number of patent attempts that have tried and failed to produce a suturing mechanism like Sutrue's. Doctor Burt stated:

"As part of the patenting process we arranged several searches looking for anything like the Sutrue mechanism. From this, it became clear that the mechanism solves a problem that's been worked on for a long time - one of the searches turned up a patent application for a suturing device that was filed in 1908! The searches found various devices that tried to automate suturing, but no one else had managed to devise the key feature that makes the Sutrue device work so well. As a result, we've been able to obtain granted patents for the Sutrue mechanism in several jurisdictions including Europe, the USA, Russia and Australia."

## EDITORS NOTES

- Sutrue is an innovative medical research company that utilises 3D printing and rapid prototyping to enable the design and creation of cutting edge medical technology. They were formed in 2012.
- The Sutrue handheld device was the first of the two suturing devices to be created, with initial ideas drawn up by Alex Berry in 2008.
- The original idea for a suturing device came from Mr Berry when he was watching a program about robotic surgery. He gained an understanding of how sutures are currently achieved with forceps and upon seeing this Mr Berry decided there had to be a better way to do it.
- Development on the robotic / endoscopic device started in 2014 and was proven to successfully work in 2018.
- The mechanism at the heart of the two suturing devices has been patented across (but not limited to) Europe, the USA, Hong Kong and Australia
- The handheld device is currently exhibited at the Design Museum in their 'Designer, Maker, User' exhibition.
- Sutrue has received investment from a range of private and public sources including the NHS.

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