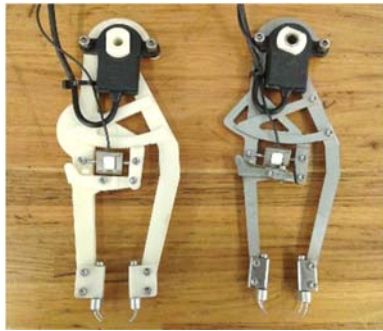


## LapCFORCE, a surgical device to improve laparotomy closure for incisional hernia prevention

**Areas:** Medicine, Mechanical Engineering

**Collaboration Opportunity:** Available to license

**Summary:** A multidisciplinary team involving surgeons and mechanical engineers developed a **prototype of medical device to support surgeon's decisions during the closure of an incision in the abdominal wall**, known as laparotomy. The device acts as a dynamometer and measures the closing force between edges in a laparotomy. With such real-time information, surgeons may decide the most appropriate closure technique and materials to be used for each single patient for reducing the laparotomy's closing force, essential to prevent incisional hernia, considered as one of the most prevalent postoperative complications.



**Need:** Everyday surgeons carry out thousands of abdominal incisions. Currently, the surgical technique and materials used to close the abdominal fascia are selected based on the surgeon's experience and is merely empirical. Patients undergoing a laparotomy have **up to 20% of probability to develop incisional hernia within the next three years after surgery**. One of the main intraoperative factors for the development of an incisional hernia is the tightness of the suture, but there is **no commercial device to measure the tension force required to suture a laparotomy**.

**Market:** WHO established an estimation of the number of major surgical interventions worldwide around 234.2 million. In 2014, the total amount of major surgeries reported by the Catalan Institute of Health Annual Report was 107,248. Only in the United States of America 200,000 incisional hernias – postoperative complications - are treated every year with a cost estimate of 2500 M \$; similar values can be found in Europe. Around 7.5% of the

European health expenditure is for medical technologies. For general and plastic surgery devices, forecasts set up to 6.5% of market share and a 4% of sales growth in 2020, positioning this sector in the top 10 growing areas for medical technologies worldwide.

**Commercial Applications:** surgical device for optimal incisions closure.

### Competitive Advantages:

- ✓ Medical device of reduced dimensions to be used in surgical rooms
- ✓ Precision medicine adapted to every single patient
- ✓ Developed and tested in preclinical models (pigs)
- ✓ Force and distance measurements are registered simultaneously
- ✓ High accuracy determinations: for the force ( $\pm 0.2$  N) and the distance ( $\pm 1$  mm)
- ✓ Several instruments can be coupled to obtain measures at the same time at different zones in the laparotomy

**Funding received:** ISCIII grant for health research (national funding)

**Development status:** prototype successfully tested in pigs under anesthesia

### Intellectual Property:

- Spanish patent pending: P201630202
- PCT file: PCT/ES2017/070096

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