

About EMCI

EMCI is a premier, quintessential medical device developer that creates human health-advancing, market-dominating products. EMCI seeks and develops disruptive technologies in a wide array of medical disciplines. EMCI translates high-level scientific research and medical innovation into market-ready devices.

Working with innovators is what we do. . . every single day. We have the expertise to understand where you are in the process, and we can help to show you the "lay of the land" when it comes to bringing your idea from concept to commercial product.

We produce and manufacture our own medical device innovations. We deal with the FDA and other regulatory bodies every day. Because of our unique experience, we bring a great deal of emphasis on quality to each product we take on. We don't just engineer and manufacture – we improve.

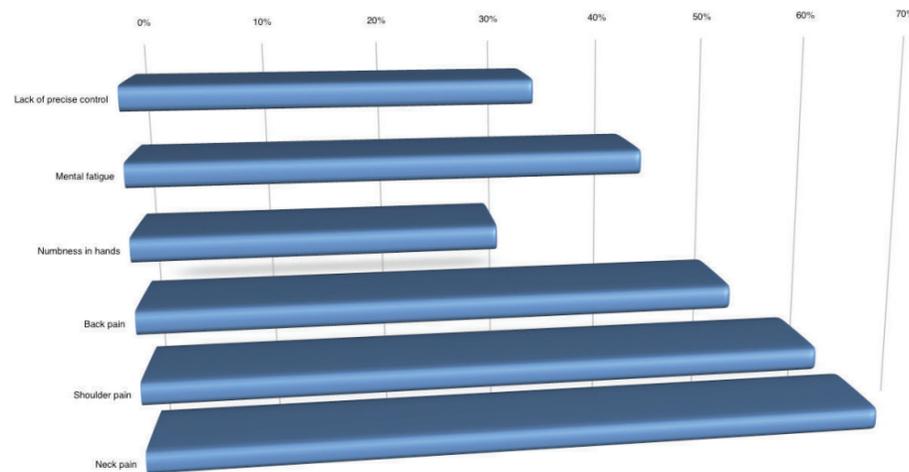
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Surgeon Discomfort with Current Tools

Minimally invasive surgery is done with a small incision to limit the pain of the patient. Current tools, along with the operating room environment and posture of the surgeon cause fatigue, discomfort, and instances of long-term damage to the surgeon's hands, wrists, arms, and shoulders.

An operating environment using a conventional tool is limited in external and internal range of motion. Limited range leads to extended operative time along with surgeon discomfort and fatigue. Extended operation time also leads to additional patient discomfort and health risk. Limiting these factors are major goals of minimally invasive surgery.

In the figure below, surgeons reported the following issues when using conventional tools in minimally invasive procedures:



Bending the Learning Curve

A study that evaluated different control schemes on a replica of the Intuitool found that users rapidly adopted the control means used in the Intuitool with a high degree of confidence. Subjects were significantly better (with a confidence level of 95%) with the Intuitool interface as opposed to other control schemes.

In a different study looking at target location utilizing different laparoscopic tools, surgeons using the Intuitool improved rapidly. Subjects used the tools to touch targets in a simulated abdomen. Even with minimal experience, subjects were able to touch the targets in substantially less time. The rapid improvement of subjects in the test demonstrates the intuitive design of the device is simple to learn.

An Enthusiastic Reception

Finally, in a study of 38 laparoscopic surgeons on the comfort of the Intuitool, when compared with conventional tools, more than 80% commented on the comfort of the tool, and 89% expressed interest in working with the tool to better learn its operation.



Intuitool Articulating Trackball Laparoscopic Tool

by Epic Medical Concepts & Innovations, Inc.

A Harsh Learning Curve

The learning curve of laparoscopic procedures is a significant barrier to its wider adoption. Laparoscopic skills are not intuitive and their innovative nature defies traditional surgeon apprenticeship. Despite advances in surgical training, the learning curve for laparoscopic procedures remains steep.

Surgeons and engineers at the University of Nebraska invented a novel laparoscopic instrument concept with an intuitive, ergonomic control: the Intuitool. In addition to reducing discomfort from awkward postures and pressure points, in several studies, the intuitive interface was rapidly adopted by surgeons. Instruments that are more intuitive and easier to adopt are one means to bend the steep learning curve of laparoscopic surgical procedures.

Epic Medical Concepts & Innovations, Inc. specializes in bringing conceptual medical devices to reality and to the marketplace. After licensing the rights to the Intuitool from the University of Nebraska, EMCI undertook a competitive analysis to determine what requirements were needed to produce a tool that went beyond ergonomics and intuitive control, and exceeded the capabilities of all other tools currently available.

The result is an Intuitool instrument that provides market-leading specifications, an easy-to-learn, ergonomic interface, and a cost-effective solution that will be a disruptive new technology in the laparoscopic space.

The Intuitool

The Intuitool is a laparoscopic grasper developed to operate in multiple positions. It is obvious to grasp and the surgeon intuitively understands how to articulate and close the grasper based on hand position. Because of its unique properties, the Intuitool is a truly ambidextrous solution that will fit and hand from medium to extra large.

When the user presses the trackball and moves it forward, the grasper articulates in an upward direction. Similarly, the grasper articulates left, right, or down when the surgeon moves the trackball left, right or back respectively. The degree of articulation is controlled by the amount of movement made in any given direction by the surgeon, from 1 to 80 degrees. Perhaps most importantly, once pressure is taken off of the trackball, the articulation stays locked in place so that the surgeon can let go of the tool.

The grasper mechanism is a spring-loaded trigger that includes a ratcheting system so that the amount of grasp pressure can be locked in place. A release tab located at the bottom of the trigger allows the ratchet to be disengaged so that the trigger springs the grasper back open.

This combination of locking articulation and locking grasp allows the device to be put into position and then left unattended while the surgeon works with other tools. The Intuitool is the only tool on the market with this degree of control.

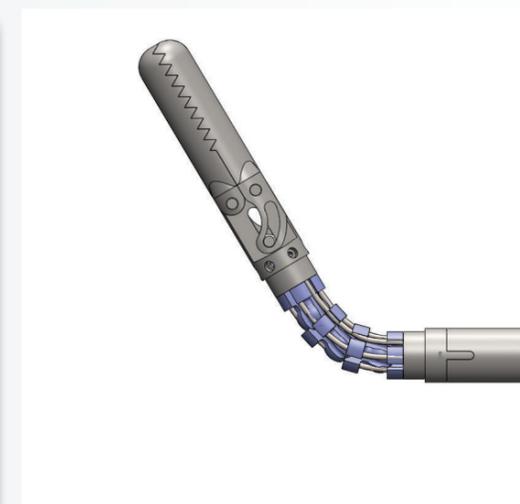
Intuitool also has a reusable handle, which makes it a cost effective solution in a highly competitive field of products. The handle can be immersed, steam sterilized, or irradiated many hundreds of times during its useful life. The shaft/ball assembly are single use and disposable, and can be switched in seconds with the press of a button.

Intuitool Features

- 80 degrees of articulation in any direction around the axis
- Rubberized trackball control over articulation and shaft rotation
- Articulation lock
- Ergonomic handle
- Locking hinged grasper
- Reuseable handle
- Interchangeable shafts with quick release mechanism
- Ambidextrous control
- 5mm shaft diameter for minimal incision size



Trackball and ratcheting, spring-loaded grasper trigger controls.



Grasper articulation linkage.



Disposable shaft / ball assembly removed from reusable handle.

Intuitool Technology

The Intuitool includes an array of patent-pending innovations that allow it to function. The trackball articulation sphere uses a friction brake to hold its articulation and rotational position in place. A simple thumb press on the trackball releases the brake and allows the user to reposition the articulation or rotation with the flick of the thumb. Once the thumb pressure is released from the trackball, the friction brake reengages, holding the new position. This innovation is the foundational technology that allows the industry-leading 80 degrees of articulation around the axis of the shaft. In integral 6-wire system controls the articulation of the grasper, and a Nitinol central shaft controls the open and close motion of the grasper. This is all accomplished inside the confines of a 5mm shaft, making it by far the most feature-rich tool in its class.