

# HANDX HYBRID PLATFORM FOR SIMPLER MINIMAL INVASIVE SURGERIES

Amir Szold<sup>1,2</sup>

<sup>1</sup>Medical Director, Assia Medical Group, Tel Aviv, Israel, <sup>2</sup>CMO, Human Xtensions LTD, Kfar Neter, Israel

Human Xtensions (HX) is developing a hybrid system, HybridX, that combines the HandX, the Company's handheld steerable robotic handheld device with mounted collaborative robotic (cobot) arms for simpler Minimal Invasive Surgeries (MIS). The HybridX system allows a surgeon to control the HandX from afar or work side-by-side with a robotic arm while improving robotic dexterity. The HybridX combines the capacity of robotics with the simplicity of laparoscopy for a variety of surgical fields.

The HandX is a fully articulating 5mm software-driven handheld device with changeable instruments, where the surgeon holds and moves the ergonomic handle to control the instrument and end-effector (such as a needle-holder, hook, etc.). The HybridX connects this device to mounted robotic arms that will be controlled using a remote-control interface. This removes the fulcrum effect seen in basic MIS, making the surgery more instinctive and easier to learn. It also reduces tremors because the surgeons control the wristed end effectors versus articulating laparoscopic instruments. The system provides the ultimate flexibility – the surgeon can easily switch between laparoscopic and robotic surgery without the removal of instruments from the trocar. The HybridX can use any instrument on any arm and the OR staff can change instruments during a procedure.

The system will include a sterile remote-control interface (RCI) to control the HandX and robotic arm with maximum flexibility for the user, allowing him to work inside or outside the sterile field, fully laparoscopically, fully robotically, or in both states simultaneously (one hand each) (fig 1). The intuitive RCI will be capable of toggling control between multiple cobot arms, such as one mounting a laparoscope and two mounting HandX devices, all controlled remotely by one surgeon. The improved ergonomics allow the surgeon to work while standing or sitting with weightless instruments. Furthermore, the system will be modular, consisting of separate carted cobot arms, enabling different hybrid configurations and optimizations to the surgeon's needs and the hospital expenses. These unique features will assist laparoscopic surgeons to easily adapt to the new hybrid surgery technology and take advantage of the benefits of both smart handheld and mounted tools.

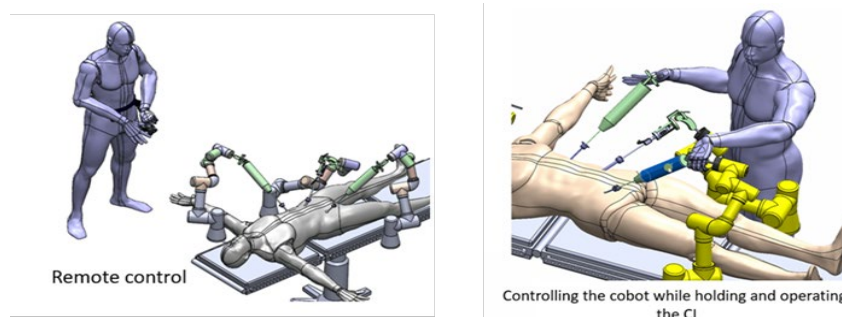


Figure 1 Surgeon can work via remote-control or hybrid surgery