

## ***Surgical Robots -- Markets Reach \$20 Billion By 2021***

LEXINGTON, Massachusetts (April 30, 2015) – WinterGreen Research announces that it has published a new study *Surgical Robots: Market Shares, Strategy, and Forecasts, Worldwide, 2015 to 2021*. The 2015 study has 553 pages, 216 tables and figures. Worldwide surgical robot markets are poised to achieve significant growth as next generation systems provide a way to improve traditional open surgery and decrease the number of ports needed for minimally invasive surgery.

Intuitive Surgical has market leadership position, advanced technology, an impressive installed base and a well trained group of surgeons able to manage the robots. Patients fare better when the surgery is done by surgical robots. The documentation of improvements in care delivery, the ability to ensure better outcomes from surgery promise that surgical robotics is a strong growth market.

Intuitive Surgical will be difficult to dislodge, its dominant position is based on technological excellence that keeps being improved and competitors have a difficult time catching up, much less improving on the Intuitive Surgical technology. Other leading competitors will emerge and the group of several surgical robotic companies will collectively have enough marketing dollars and enough marketing clout to drive replacement of all open surgery. Robotic surgery is positioned to become the standard of care.

Intuitive Surgical has achieved market saturation in colorectal surgery in the US, it will work on increasing its presence in other surgical market sectors. The leading robotic surgical companies are poised to grow through acquisition, purchasing smaller companies that have developed as specialized product and gained FDA approval. As detailed in the market research study there are a lot of those in every medical specialty and more to come.

The surgical robot market is characterized enormous variety and innovation.



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Snake robots are wonderfully interesting surgical robots. Medrobotics offers a highly articulated multi-linked robot. It enables minimally-invasive procedures to replace open surgical procedures. It works for many parts of the anatomy. It works in places in the body that are difficult or previously impossible to reach. The robot-assist platform includes on-board visualization. and contains multiple open device channels to accept a variety of third party surgical and interventional instruments. The robot enables physicians to operate through non-linear circuitous paths, self-supported, and through a single-site access into the body.

The maneuverability of the robot is gained from its numerous mechanical linkages with concentric mechanisms. Each mechanism can be placed into a rigid or a limp state. By employing a patented "follow-the-leader" movement strategy with these alternating states, the robot can be directed into any shape through the relative orientations of its linkages.

A surgical robot recurring revenue model business model is essentially large one time purchase for a system complimented by replaceable or disposable instruments that cumulatively market a much larger and ongoing market. Vendors make money from the one time sale of a system and recurring revenue from sale of devices used in every operation.

Initially, a vendor sells and installs the surgical system into new customer accounts. Once systems are sold into customer accounts, the vendor generates recurring revenue as our customers use the system to perform surgery. To do surgeries, the customers need to buy and consume instruments and accessory products. Vendors also generate recurring revenue from system service.

The ability to deliver such an accurate dose of radiation means that the cancer can be eradicated in patients before the patient is administered a lethal dose of radiation. This represents a cure for cancer once it gets working according to the promise of the systems now in place. .



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The Accuray radiation systems that address the oncology market are perhaps the most exciting technology ever offered to any market. Because the systems are able to control the dose of radiation

Amount of activity in the market, many companies, FDA approvals, way for existing vendors to improve footprint in market

In the field of radiation oncology, the Accuray CyberKnife® Robotic Radiosurgery System is universally recognized as the premier radiosurgery system capable of delivering high doses of radiation with sub-millimeter accuracy anywhere in the body. As validated and proven in numerous peer-reviewed publications, the precision and accuracy of the system combines with continual image guidance and robotic mobility to deliver treatments characterized by high conformality and steep dose gradients.

The newest addition to the CyberKnife product line, the CyberKnife VSI™ System, continues Accuray's tradition of innovation. Building on a foundation of accuracy and precision in radiosurgery, the CyberKnife VSI System extends these benefits to fractionated high precision radiation therapy with Robotic IMRT™ that can be delivered anywhere in the body.

The automated process revolution in surgery and communications is being implemented via robots. Robots automation of systems is providing significant improvement in the accuracy of surgery and the repeatability of process.

According to Susan Eustis, lead author of the study, "Existing open surgery can be replaced in large part by robotic minimally invasive surgery (MIS) during the ofrecast period. Minimally invasive robotic surgery, new robotic radiation treatment, and emerging robotic surgical approaches complement existing surgery techniques. Soon, all surgery will be undertaken with at least come aspects of robotic surgery replacing or complementing open surgery."

During a robot assisted surgical procedure, the patient-side cart is positioned next to the operating table with the electromechanical arms arranged to provide access to the initial ports selected by the surgeon. Metal tubes attached to the arms are inserted through the ports, and the cutting and visualization instruments are introduced through the tubes into the patient's body.



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The surgeon performs the procedure while sitting at a console, manipulating the instrument controls and viewing the operation through a vision system. When a surgeon needs to change an instrument the instrument is withdrawn from the surgical field using the controls at the console. This is done many times during an operation.

The companies that get an early foothold in the market have significant strategic advantage. The robotic surgical technique benefits hospitals by reducing the length of patient stays, thereby enabling better cost management. This factor is driving demand for surgery robot systems. Since robotics provide surgeons with a precise, repeatable and controlled ability to perform procedures in tight spaces, they are increasingly in demand.

The aging US population has supported demand, since the occurrence of health issues that require medical devices is higher in the elderly population. Buoyed by strong demand and sales, industry profit margins have increased considerably during the past five years.

Hospitals are adopting robotic surgical devices to improve their outcomes numbers. Hospitals are measured on outcomes, robots for surgery, when used by a trained physician are improving outcomes significantly.

Hundreds of universities worldwide have research programs in robotics and many are awarding degrees in robotics. These “roboticists” are increasingly being hired by Global 2000 organizations to link mobile robots (mobile computers) into existing IT systems.

Compared with other minimally invasive surgery approaches, robot-assisted surgery gives the surgeon better control over the surgical instruments and a better view of the surgical site. Surgeons no longer have to stand throughout the surgery and do not tire as quickly. Hand tremors are filtered out by the robot’s computer software. The surgical robot can continuously be used by rotating surgery teams.

Surgical robot device markets at \$3.2 billion in 2014 are anticipated to reach \$20 billion by 2021 as next generation devices, systems, and instruments are introduced to manage surgery through small ports in the body instead of large open wounds.



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The complete report provides a comprehensive analysis including procedure numbers, units sold, market value, forecasts, as well as a detailed competitive market shares and analysis of major players' success, challenges, and strategies in each segment and sub-segment. The reports cover markets for: medical specialties and sub-specialties.

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WinterGreen Research supports various market segment programs; provides trusted technical services to the marketing departments. It carries out accurate market share and forecast analysis services for a range of commercial and government customers globally. These are all vital market research support solutions requiring trust and integrity.

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