

# Robotic Surgery: Research and Reviews 2014: editorial foreword

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Leonardo da Vinci has been credited with the design in 1495 of the first known robot, which was capable of human-like motions through the manipulation of multiple coordinated pulleys.<sup>1</sup> The term “robot” stems from the Czech word “robota”, referring to compulsory labor, and was popularized in English vocabulary as early as 1923. Today, the Robotics Institute of America defines “robots” as “reprogrammable, multifunctional manipulators designed to move material, parts, tools, or specialized devices through various programmed functions for the performance of a variety of tasks”.<sup>2</sup>

Robotic technology entered the surgical industry as early as 1985, beginning with applications to improve accuracy and precision in neurosurgery during stereotactic brain biopsies<sup>3</sup> and in the field of orthopedics for joint alignment.<sup>4</sup> Robotic assistance soon emerged as a tool to overcome problematic ergonomics limiting dexterity and the pitfalls of bi-dimensional imaging associated with traditional laparoscopic approaches, with roles quickly expanding to urologic, gastrointestinal, cardiac, maxillofacial, ophthalmologic, and gynecologic subspecialties, among others.<sup>5</sup>

Remote surgery was pioneered in parallel at the Stanford Research Institute with input from plastic surgeon Joseph Rosen and engineer Phil Green,<sup>6</sup> and attracted interest from the United States Army given its potential use within a hostile battlefield environment.<sup>7</sup> The first robotic assistant arm (AESOP® [Automated Endoscopic System for Optimal Positioning]; Computer Motion, Inc, Goleta, CA, USA) was designed to manipulate the laparoscope and received approval from the US Food and Drug Administration in 1994. Zeus® (Computer Motion, Inc) was the first robotic system with a remote console capable of long-distance surgery, including the transcontinental “Operation Lindbergh”, in which a surgeon in Manhattan, New York, performed a laparoscopic cholecystectomy on a patient in Strasbourg, Germany. The da Vinci® surgical system prototype (Intuitive Surgical, Inc, Sunnyvale, CA, USA) with three arms then obtained US Food and Drug Administration approval in July 2000, and largely supplanted all previous systems.

The field of robotic surgery continues to rapidly evolve. Presently, there remains a great need for additional trials to objectively compare clinical outcomes and the cost-effectiveness of robotic compared to traditional laparoscopic and open procedures, including expanding roles in bariatric populations. Novel techniques and refinements in existing methods, such as single-site robotic-assisted surgery, are continually emerging. The full scope of telesurgery and telementoring in global access to health care remains undefined.

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The purpose of this journal is to provide an intellectual forum for such discussions. We look forward to sharing your insights, original research, and systematic reports. Welcome to the inaugural edition of *Robotic Surgery: Research and Reviews* 2014.

## Disclosure

The authors declare no conflicts of interest in this work.

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