Robotic Urological Surgery has transformed the surgical treatment of Urological disease in the United States, but is less well accepted in the rest of the world. This state–of–the–art lecture will trace the development of robotics, and will attempt to look into future potential. The first part is based on robust data, the second is merely an informed opinion. The presentation uses the traditional definition of robotic surgery ie surgery performed using the daVinci System, a surgical manipulator built by a single manufacturer.

Although the surgical robot was designed for cardiac surgery, its initial acceptance was for Urological Surgery, and more specifically for Radical Prostatectomy. While several other surgeons had performed individual cases or small series of cases, the first formal analysis of robotic prostatectomy was done by Menon's team at the Vattikuti Urology Institute (J Urol. 2002 : 198, 945-9). In subsequent publications others and they showed that robotic prostatectomy was safe, associated with less blood loss and resulted in equivalent oncological outcomes when compared with conventional surgery. Technical modifications resulted in improvements in functional results. Video clippings of these modifications...internal iliac node dissection, incremental nerve–sparing, percutaneous bladder drainage... will be presented. While the acceptance of robotic prostatectomy has been slow in traditional academic circles, patients have embraced the technology, and over 70% of radical prostatectomies in the US are performed robotically. The rate of adoption of this technique far exceeds that of electricity, telephones or the internet, but is slower than the adoption rate for laparoscopic cholecystectomy.

The second phase of the adoption of robotics came with the realization that the advantages of robotics, or, more accurately, computer–assistance extended beyond the prostate. Techniques were developed for radical cystectomy, partial nephrectomy and for pediatric urological procedures. In each instances, the robotic experts claimed advantages : in each instance, surgeons not proficient in robotics decried these advantages. Despite the lack of randomized trials, the single procedure that currently shows the most rapid acceptances is robotic renal surgery.

What is the future of robotics? This depends on how robotics is viewed. It is argued that the daVinci system is not a true robot, and there is some merit in this argument. It is more accurately, a surgical manipulator, a sophisticated but vastly expensive tool that marries computer–skills with surgical skills. Viewed that way, robotics brings to surgical disciplines enhanced surgical ability similar to the enhanced diagnostic ability provided by computed tomography or MRI to the diagnostician. In that case, the utility of robotics is limited only by the bounds of surgical imagination. The major factor limiting its acceptance becomes the staggering cost of purchasing and maintaining the equipment, which runs into millions of dollars a year for busy robotic programs. Robotics has survived, or even succeeded in the United States, because these costs are borne by philanthropy and the Hospitals, and not passed on to the patients or their Insurers. In countries where this is not possible, really, most of the world, robotics has struggled. The future of robotic surgery in Urology will largely be determined by cost factors. If these costs can be controlled, robotics will supplant "open" surgery for most complex surgical problems. If not, it may remain a privilege for the fortunate few.