INTUITIVE SURGICAL®

Robotic assisted surgery
HTA bibliography – National and state HTAs 2014 to 2011

Disclaimer: Due to the highly dynamic development of new and improved quality of clinical research studies, we suggest to focus on HTAs done since 2011 as the findings of older HTAs may be obsolete

A) UK NHS / Scottish NHS

- ***NICE Clinical Guideline Program – Prostate Cancer Update, 2014***
  - Intervention: RALP, LRP, OPEN
  - NICE recommendation:
    - Commissioners of urology services should consider providing robotic surgery to treat localised prostate cancer
    - Commissioners should ensure that robotic systems for the surgical treatment of localised prostate cancer are cost effective by basing them in centres that are expected to perform at least 150 robot-assisted laparoscopic radical prostatectomies per year
- ***Health Technology Assessment - NIHR HTA Programme 201, Vol 16, Nr 41***
  - Intervention: RARP versus LRP
  - Reference: Ramsay, C. P., R.; Robertson, C.; Close, A.; Vale, L.; Armstrong, N.; Barocas, D.; Eden, C.; Fraser, C.; Gurung, T.; Jenkinson, D.; Jia, X.; Lam, T.; Mowatt, G.; Neal, D.; Robinson, M.; Royle, J.; Rushton, S.; Sharma, P.; Shirley, M.; Soomro, N. (2012). "Systematic review and economic modelling of the relative clinical benefit and cost-effectiveness of laparoscopic surgery and robotic surgery for removal of the prostate in men with localised prostate cancer." Health Technology Assessment 16(41): 1-313.
  - Key findings (selected)
    - Outcomes were generally better for robotic than for laparoscopic surgery for major adverse events such as blood transfusion and organ injury rates and for rate of failure to remove the cancer (positive margin)
    - Probability outcome favours robotic prostatectomy. The predicted probability of a positive margin was 17.6% following robotic prostatectomy compared with 23.6% for laparoscopic prostatectomy.
    - The ICER in the base-case analysis (200 procedure per robot per year) was GBP 18,329 / QALY. If the base analysis is altered to a

life time horizon, the incremental cost per QALY is GBP 1,436

- Conclusions:
  - This study demonstrated that robotic prostatectomy had lower perioperative morbidity and a reduced risk of a positive surgical margin compared with laparoscopic prostatectomy although there was considerable uncertainty.
  - The modeling showed that robotic excess cost can be reduced if capital costs of equipment are minimized and by maintaining a high case volume for each robotic system of at least 100-150 procedures per year.

- ***Health Care Improvement Scotland - Open, laparoscopic and robot-assisted laparoscopic radical prostatectomy for localised prostate cancer – an update (2013)***
  - Intervention: RALP, ORP, LRP
  - Key findings (selected)
    - RALRP does take longer to perform than open surgery but is associated with less intra-operative blood loss, lower transfusion, shorter length of stay, and better functional outcomes. The evidence on oncology outcomes and complications is inconclusive
    - Studies comparing laparoscopic surgery with robot-assisted laparoscopic surgery report inconsistent results for operative time, length of stay, blood loos, transfusion, and oncology and functional outcomes. The evidence shows no difference in overall complication rates

- ***NICE Interventional Procedure Guidances (IPGs)***
  - Guidance
    - IPG 128 Totally endoscopic robotically assisted coronary artery bypass
    - IPG 193 Laparoscopic prostatectomies
    - IPG 275 Laparoscopic prostatectomy for begnin prostate obstructions
    - IPG 287 Laparoscopic cystectomy
  - Not in merit
    - Laparoscopic and robotic cystectomy
    - Robotic assisted pyeloplasty
    - Robotic assisted laparoscopic hysterectomy
    - Robotic procedures in children including fundoplication
    - Intelligence on Robotic cardiac ablation for cardiac arrhythmias
    - Robot assisted radical cystectomy and extracorporeal urinary diversion
    - Robotic assisted laparoscopic live donor nephrectomy

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B) CANADA

- ***Ontario Health Technology Advisory Committee (OHTAC 2014).***
- Reference:
    - Robotic-assisted minimally invasive prostatectomy: OHTAC recommendation [Internet]. Toronto: Queen's Printer for Ontario; 2014 January. 11 p. Available from: http://www.hqontario.ca/evidence/publications-and-ohtac-recommendations/ohtac-recommendations
        - Primary conclusions (selected)
            - Men (aged 40 to 75) who had RARP for prostate cancer in Ontario had better surgical outcomes than those who had RP by other methods
        - Decision determinants (selected)
            - Based on decision determinant criteria, OHTAC weighed in favour of the safety of RARP in making its recommendation. RARP leads to fewer surgical complications than radical prostatectomy (RP) by other methods
            - Increasing the annual caseload can lower the incremental costs per patient for RARP
            -
- ***Canadian Agency for Drugs and Technologies in Health (CADTH), Ottawa, 2011***
    - Reference: Ho, C., et al. (2011). "Robot-Assisted Surgery Compared with Open Surgery and Laparoscopic Surgery: Clinical Effectiveness and Economic Analyses."
        - Procedures assessed:
            - Prostatectomies, Hysterectomies, Nephrectomies, Cardiac
        - Key message
            - Robotically assisted surgeries do improve a number of short-term patient outcomes
            - There are strategies that can help to decrease costs and maximize cost-effective use.

C) EUROPE

- ***Health Information and Quality Authority, Ireland– HTA of robotic-assisted surgery in selected procedures (HIQA Jan 2012)***

- Reference: O'sullivan, S. (2011). "HIQA Ireland Health technology assessment of robot-assisted surgery in selected surgical procedures."
- The meta-analysis of the HIQA HTA is an update of the CADTH HTA (September 2011). It follows the same methodology and has been also partially advised by CADTH experts.
    - Procedures assessed:
        - Prostatectomies, Hysterectomies, Nephrectomies, Cystectomies, Pyleoplasty, GYN General, Head&Neck, Prolapse surgery, Cardiac
- Advice
    - "The Authority's advice to the HSE is that robot-assisted surgery is superior to conventional open surgery for prostate surgery procedures across a range of outcomes, and is associated with better operative outcomes in conventional open hysterectomy procedures. Compared to conventional laparoscopic surgery generally, robot assistance is likely to be associated with less repetitive strain for surgeons, but the clinical benefits for patients would be marginal"
- Cost Effectiveness
    - Incremental cost-effectiveness ratio: 26,647 EUR / QALY based on an annual steady state caseload of 200 procedures

D) Australia

- ***ASERNIP-S 2012, Health Policy Advisor Committee on Technology – Technology Brief, Robotic assisted Lung Resection (commissioned by Health PACT)***
    - http://www.health.qld.gov.au/healthpact/docs/briefs/WP126.pdf
    - Intervention: Lung Resection – RVATS, VATS, OPEN Thoracotomy
    - Summary of findings
        - RVATS for the surgical treatment of suitable lung lesions appears to be at least as safe as the surgical alternatives, VATS and open thoracotomy. However, effectiveness data are primarily based on limited observational studies. While the da Vinci device is currently available worldwide, assistance in thoracic procedures has been reported in only a few centres, primarily in the USA and Italy. There is a significant learning curve for surgeons and costs are a concern. The observation to date is that RVATS is cost-saving as compared with open thoracotomy (primarily due to reduced hospital stay) but more costly than VATS; however, some of the technical limitations of VATS have been overcome with RVATS.

E) US

- ***Washington State Health Care Authority HTA***
  - ***Gleitsmann, K. (2012). "Washington HCA Robotic Assisted Surgery HTA program." Gleitsmann, K., Bunker, K., Kriz, H., Ryan, K., Vandegriff, S., Liu, R., Thielke, A., & King, V. (2012). ; Robotic assisted surgery. Portland, OR: Center for Evidence-based Policy, Oregon Health and Science University***

National HTAs before 2011:

Belgium KCE 2009

- Camberlin, et al. (2009). "Robot-assisted surgery: health technology assessment Health Services Research (HSR) (Belgium)."
  Camberlin C, Senn A, Leys M, De Laet C. Robot-assisted surgery: health technology assessment Health Services Research (HSR). Brussels: Belgian Health Care Knowledge Centre (KCE); 2009. KCE reports 104C (D/2009/10.273/09)

Australia ASERNIP-S 2009

- ASERNIP-S, Report No. 75, Robotic-Assisted Surgery for Urological, Cardiac and Gynaecological Procedures
  - http://www.surgeons.org/media/299222/RPT_2009-12-09_Robotic_execsummary.pdf