

# THE ROLE OF ROBOTIC SURGERY IN UROLOGY: PAST, PRESENT AND FUTURE

Mani Menon , M.D.

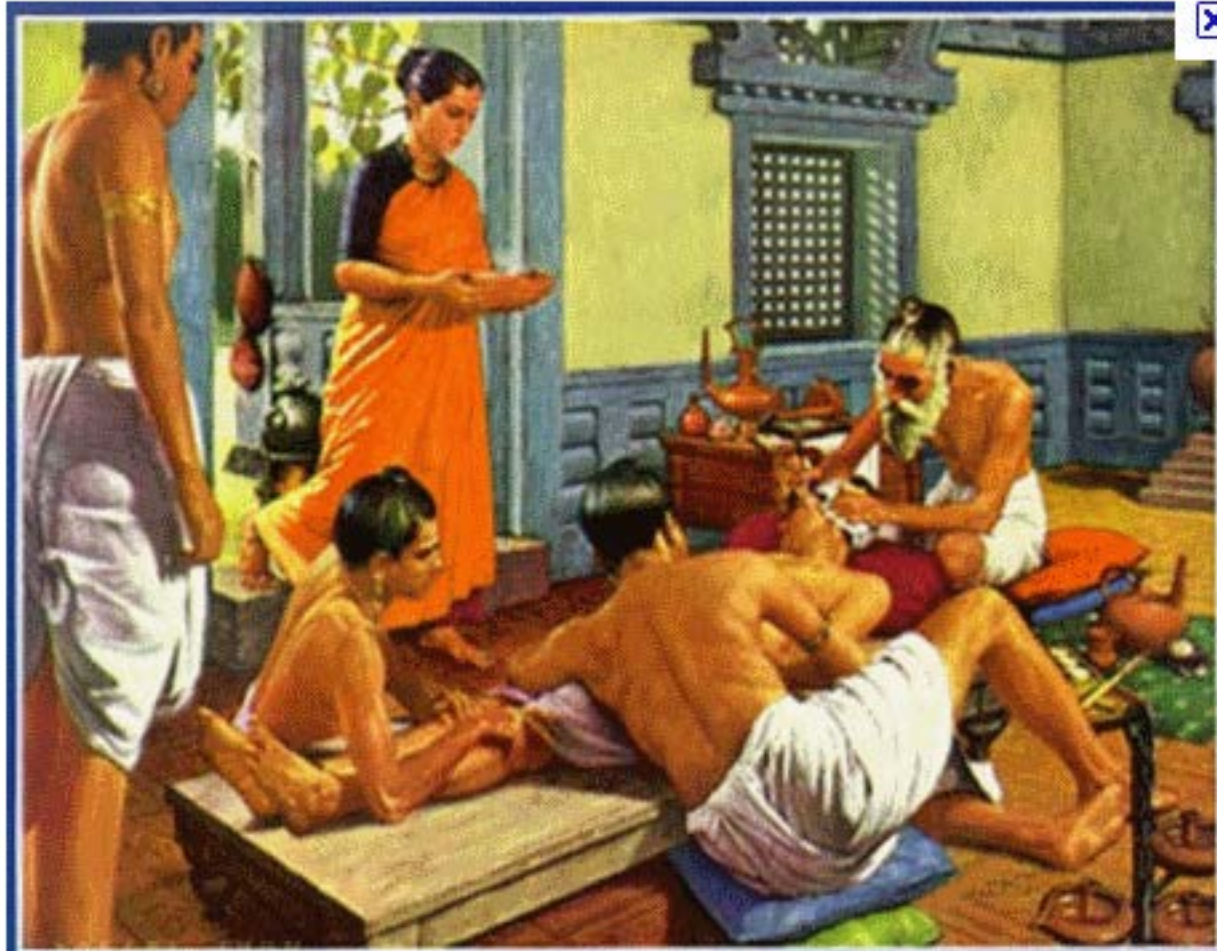
The Raj and Padma Vattikuti Chair in Oncology

Director, Vattikuti Urology Institute

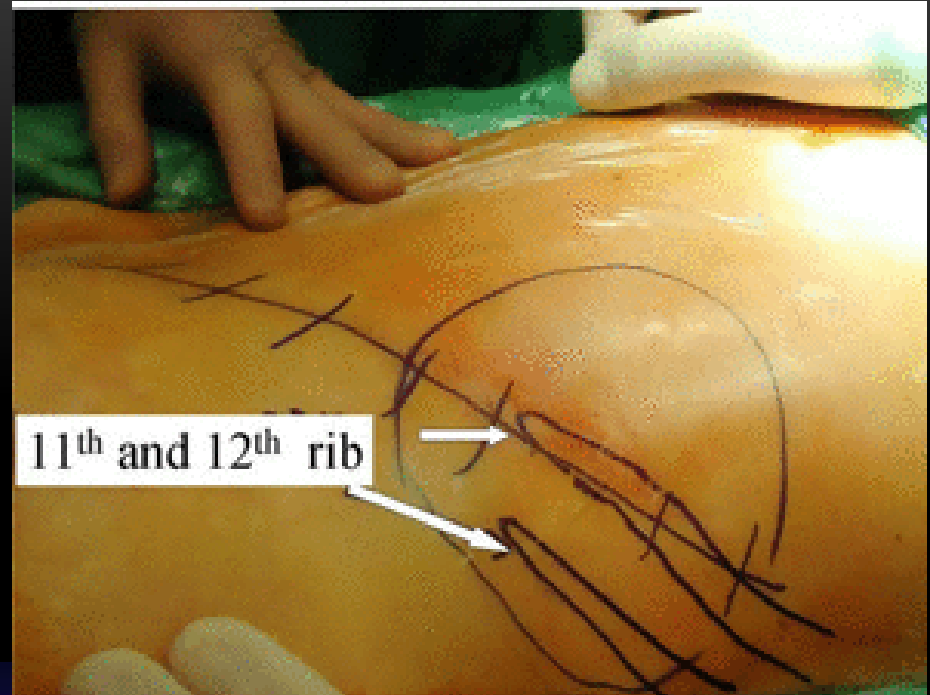
Henry Ford Health System



# How we did surgery traditionally



## Thoracoabdominal Incision



## Open Radical Prostatectomy















1

2

3

5

# Advantages of the Robot:

- Improved vision: 3D view and magnification
  - Minimally invasive
  - Greater surgical dexterity
  - Less intra-operative bleeding
-





**Origami Using  
da Vinci<sup>®</sup> Surgical System**

# WHY WAS I INVOLVED WITH ROBOTIC SURGERY?

## VUI Program Development 'Perfect Storm'

- Emerging technique
  - Laparoscopic prostatectomy
- Promising technology
  - Robotic system
- Funding
  - Raj and Padma Vattikuti
- Inspiration
  - My patients
  - My wife, Shameem Menon



Guy Vallancien

Bertrand Guilloneau





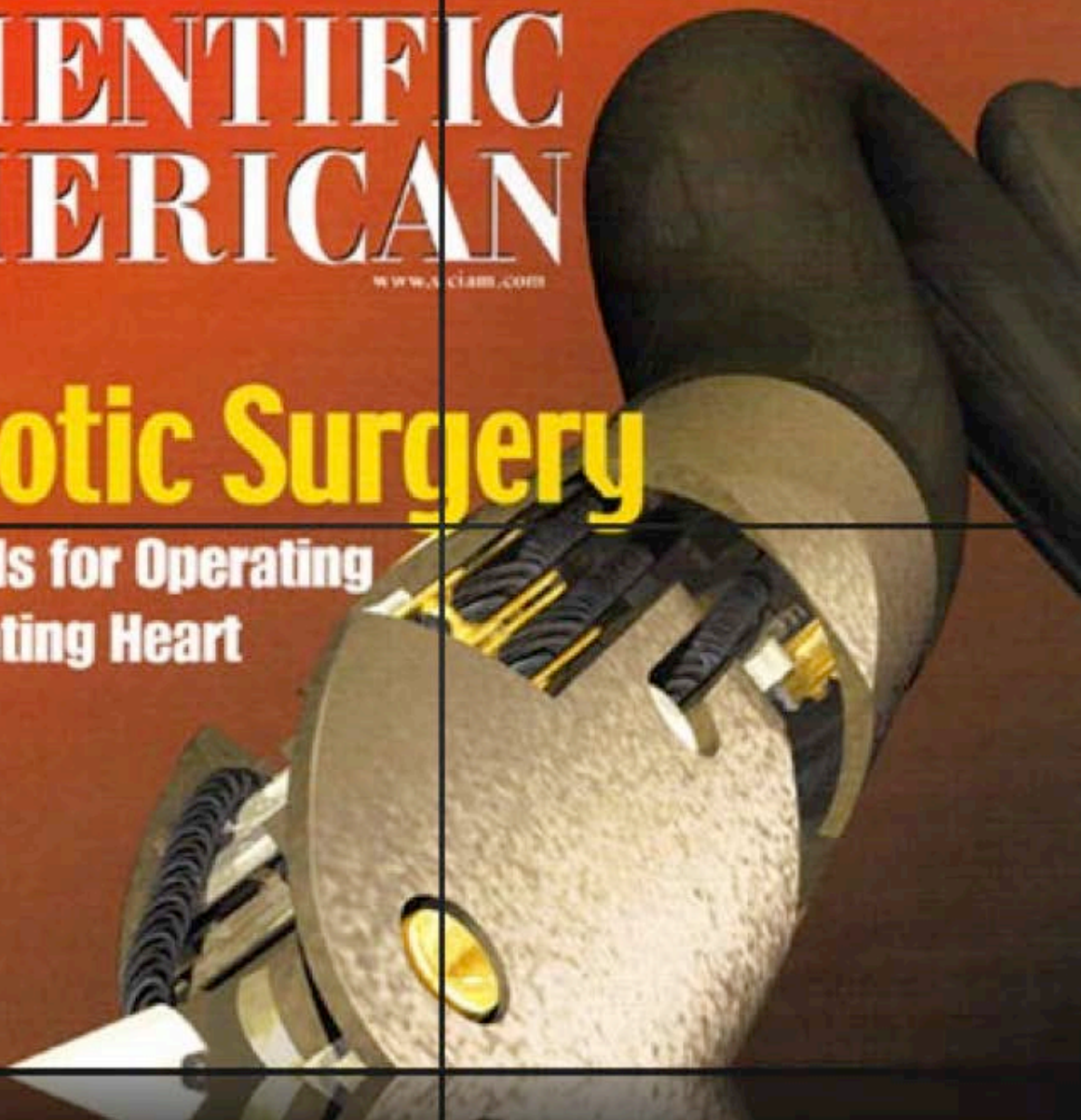
# SCIENTIFIC AMERICAN

OCTOBER 2000

[www.siam.com](http://www.siam.com)

## Robotic Surgery

New Tools for Operating  
on a Beating Heart





Raj and Padma Vattikuti







# LAPAROSCOPIC RADICAL PROSTATECTOMY: INITIAL SHORT-TERM EXPERIENCE

WILLIAM W. SCHUESSLER, PETER G. SCHULAM, RALPH V. CLAYMAN, AND LOUIS R. KAVOUSSI

0022-5347/00/1632-0418/0

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## Original Articles

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### LAPAROSCOPIC RADICAL PROSTATECTOMY: THE MONTSOURIS EXPERIENCE

BERTRAND GUILLONNEAU AND GUY VALLANCIEN

*From the Department of Urology, Institut Mutualiste Montsouris, Paris, France*

0022-5347/02/1683-0945/0

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DOI: 10.1097/01.ju.0000023660.10494.7d

### LAPAROSCOPIC AND ROBOT ASSISTED RADICAL PROSTATECTOMY: ESTABLISHMENT OF A STRUCTURED PROGRAM AND PRELIMINARY ANALYSIS OF OUTCOMES

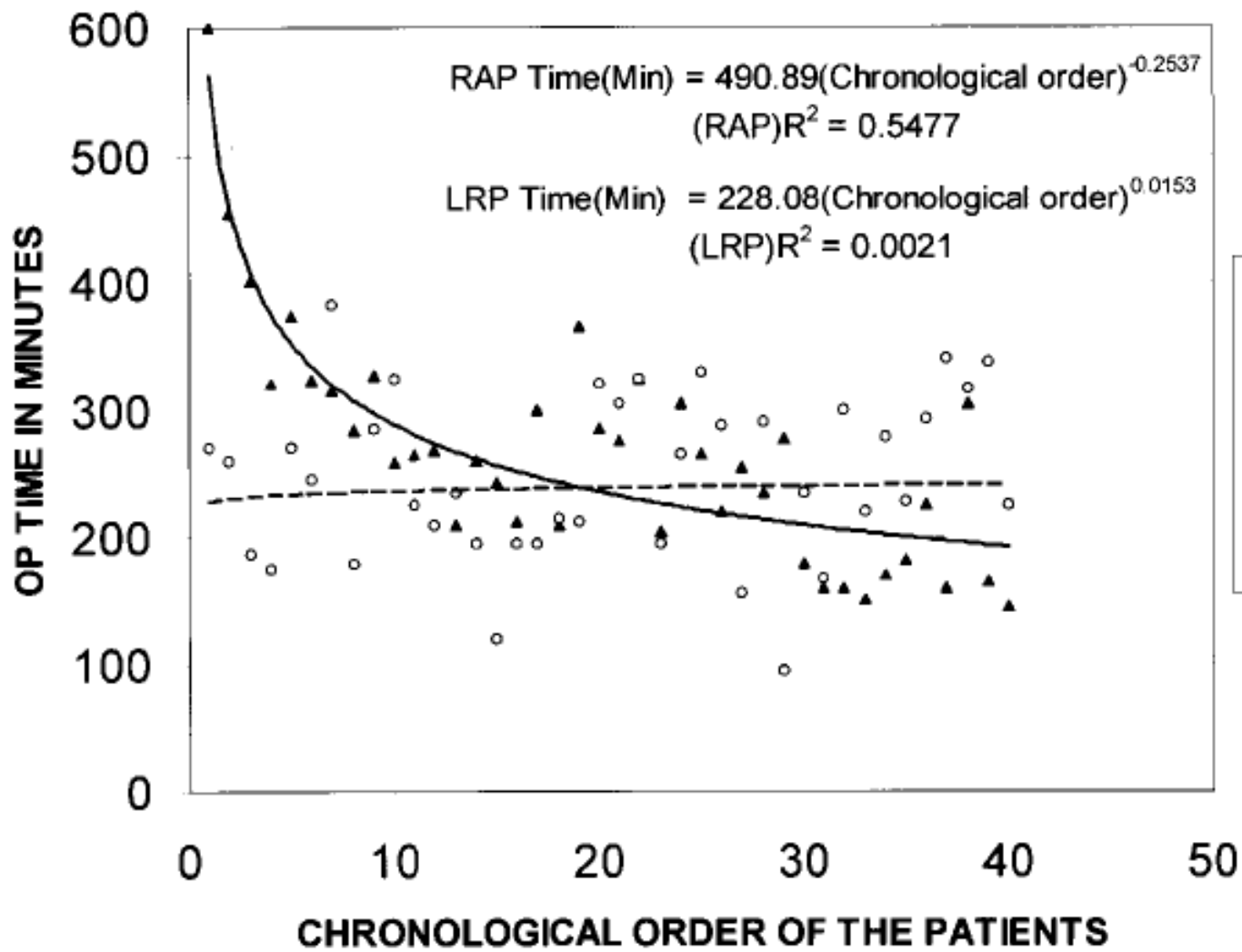
MANI MENON, ALOK SHRIVASTAVA, ASHUTOSH TEWARI, RICHARD SARLE, ASHOK HEMAL, JAMES O. PEABODY AND GUY VALLANCIEN

*From the Vattikuti Urology Institute, Henry Ford Health System, Detroit, Michigan, and the Department of Urology, Institut Mutualiste Montsouris, University Pierre et Marie Curie, Paris, France*

| Characteristic                                                  | LRP (USA) | LRP (Montsouris) | LRP (VUI)  |
|-----------------------------------------------------------------|-----------|------------------|------------|
| Cases                                                           | 9         | 120              | 40         |
| Body mass index (mean); kg/m <sup>2</sup>                       | N/A       | ~25              | 27.7       |
| Operative time (without pelvic lymph node dissection) (mean)    | 9.4 hours | 4 hours          | ~4.3 hours |
| Blood loss                                                      | 580 cc    | 400 cc           | 390 cc     |
| Blood transfusion                                               | N/A       | 10%              | 1 (2.5%)   |
| Length of stay (mean)                                           | 9.3 days  | 6 days           | ~1.5 days  |
| Return of spontaneous erections (in preoperatively potent men)* | 2/4 (50%) | 9/20 (45%)       | 3/12 (25%) |
| Urinary continence*                                             | 6 (66%)   | 44/60 (73%)      | N/A        |
| Complications                                                   | 3 (33%)   | 7 (5.8%)         | 4 (10%)    |
| Conversion to open RP                                           | N/A       | 7 (5.8%)         | 1 (2.5%)   |

\* At least 6 month follow-up

| Characteristic                                               | LRP (VUI)  | ORP (VUI) | VIP (VUI)                                  |
|--------------------------------------------------------------|------------|-----------|--------------------------------------------|
| Cases                                                        | 40         | 30        | 30                                         |
| Body mass index (mean); kg/m <sup>2</sup>                    | 27.7       | 30        | 30                                         |
| Operative time (without pelvic lymph node dissection) (mean) | ~4.3 hours | 2.3 hours | 4.8 hours (including 55-minute setup time) |
| Blood loss                                                   | 390 cc     | 970 cc    | 330 cc                                     |
| Blood transfusion                                            | 1 (2.5%)   | 17%       | 7%                                         |
| Length of stay (mean)                                        | ~1.5 days  | ~2.3 days | 1.5 days                                   |
| Complications                                                | 4 (10%)    | 5 (16.7%) | 6 (20%)                                    |
| Conversion to open RP                                        | 1 (2.5%)   | N/A       | 1 (3.3%)                                   |





| Characteristic                                                  | VIP (First 30)                             | VIP (31- 230) |
|-----------------------------------------------------------------|--------------------------------------------|---------------|
| Body mass index (mean); kg/m <sup>2</sup>                       | 30                                         | 28            |
| Operative time (without pelvic lymph node dissection) (mean)    | 4.8 hours (including 55-minute setup time) | 160 min       |
| Blood loss                                                      | 330 cc                                     | 150 cc        |
| Blood transfusion                                               | 7%                                         | 0%            |
| Length of stay (mean)                                           | 1.5 days                                   | 1.2           |
| Return of spontaneous erections (in preoperatively potent men)* | 5/17 (29.4%)                               | ~80%          |
| Urinary continence*                                             | 8/22 (36.4%)                               | 96%           |
| Complications                                                   | 6 (20%)                                    | 8/200 (6.2%)  |
| Conversion to open RP                                           | 1 (3.3%)                                   | 0 %           |

# EVOLUTION OF VIP



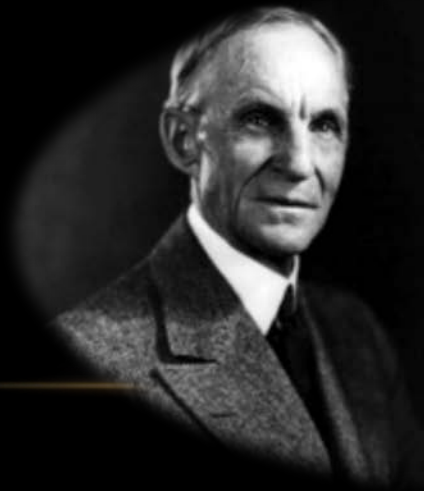
**Nerve Sparing Prostatectomy 1983**



**Laparoscopic Prostatectomy 1998**



**Vattikuti Institute Prostatectomy 2000**



“IF I HAD ASKED PEOPLE  
WHAT THEY WANTED,  
THEY WOULD HAVE SAID:  
**FASTER HORSES...**”

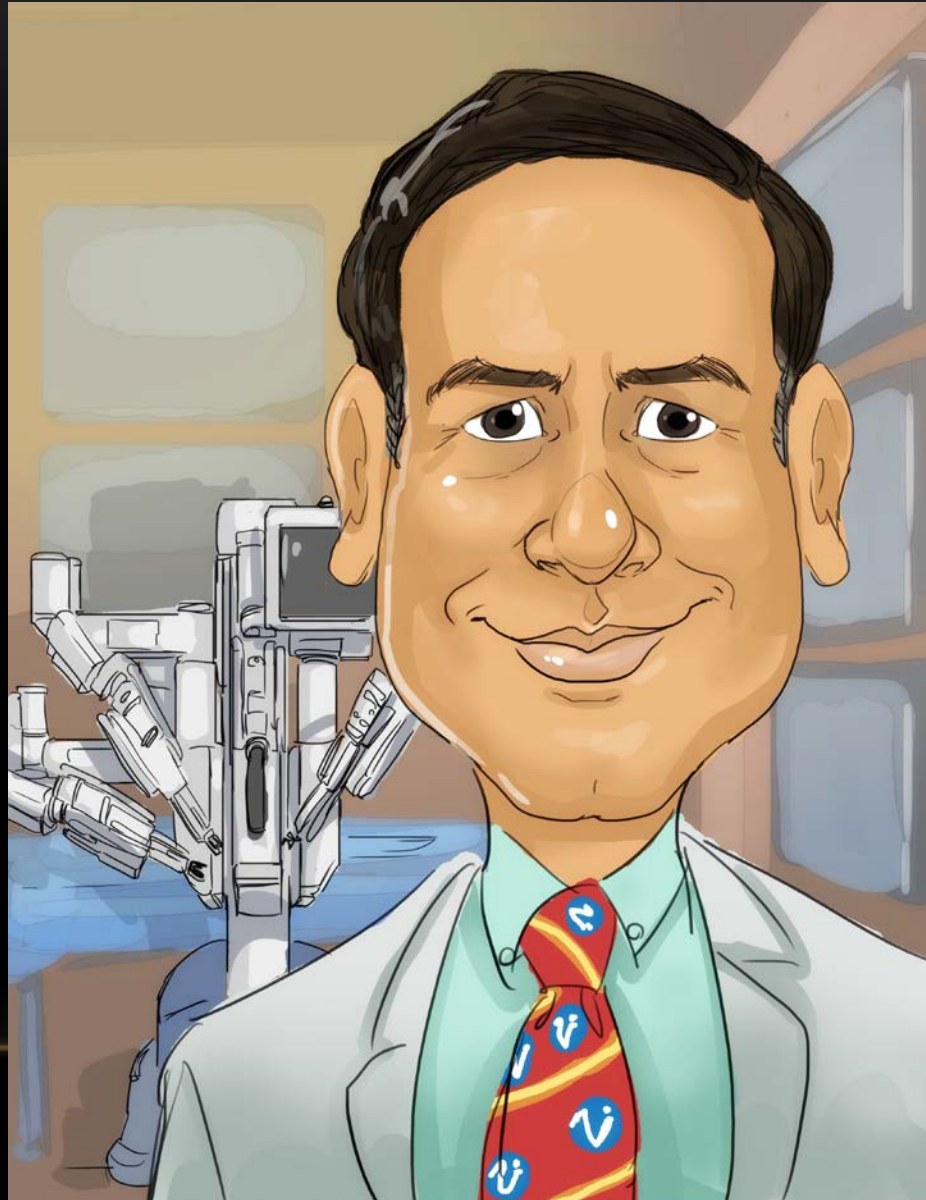
Henry Ford



Vattikuti Urology Institute



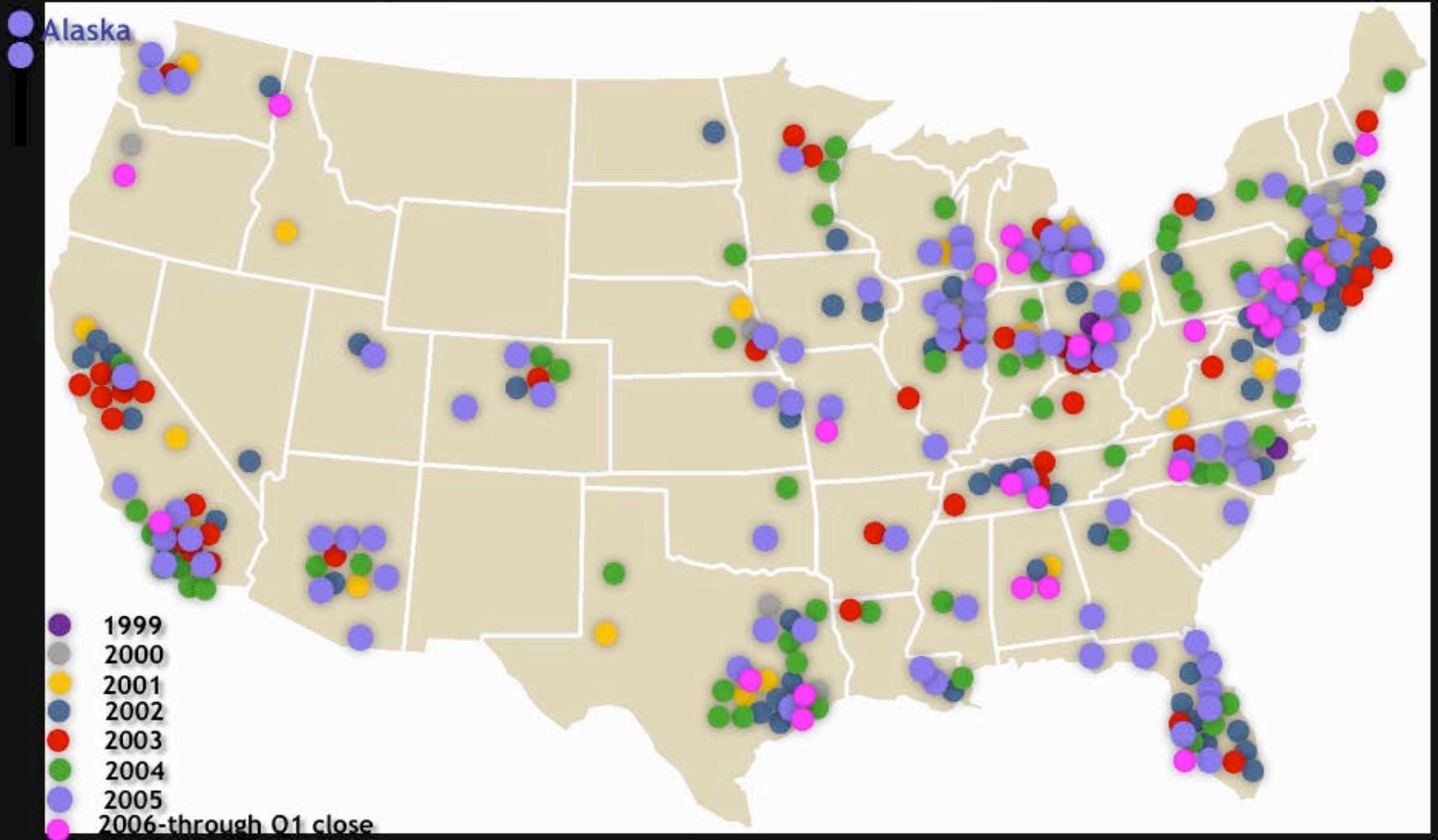
WHAT IS OUR EXPERIENCE?





Vattikuti Urology Institute

# Robotic Systems in the US (> 500,000 cases)



Robotic Prostatectomy : a decade of publications

2001-2015: No. of indexed publications on "robotic prostatectomy" = 2024

Early adopters, between 2001-2005 = 14

No. of centers publishing 5-year follow-up data = 4

No. of centers publishing 10-15 year follow-up data = 1

## Platinum Priority – Prostate Cancer

*Editorial by Michael Marberger on pp. 699–700 of this issue*

# Safety Profile of Robot-Assisted Radical Prostatectomy: A Standardized Report of Complications in 3317 Patients

*Piyush K. Agarwal<sup>a</sup>, Jesse Sammon<sup>a,\*</sup>, Akshay Bhandari<sup>a</sup>, Ali Dabaja<sup>a</sup>, Mireya Diaz<sup>a,b</sup>,  
Stacey Dusik-Fenton<sup>a</sup>, Ramgopal Satyanarayana<sup>a</sup>, Andrea Simone<sup>a</sup>,  
Quoc-Dien Trinh<sup>a</sup>, Brad Baize<sup>a</sup>, Mani Menon<sup>a,c</sup>*

<sup>a</sup> Vattikuti Urology Institute, Henry Ford Hospital, Detroit, MI, USA

<sup>b</sup> Department of Biostatistics and Research Epidemiology, Henry Ford Hospital, Detroit, MI, USA

<sup>c</sup> Case Western Reserve University, Cleveland, OH, USA; New York University, New York, NY, USA; University of Toledo Schools of Medicine, Toledo, OH, USA

- Median hospitalization time = 1 d.
- Overall complication rate = **9.8%** (Medical 2.4%; Surgical 8.0%)
- Minor (Clavien 1–2) 7.2%; Major (Clavien 3–5) 3.8%.
- 299 (**81.3%**) complications **occurred within 30 d.**

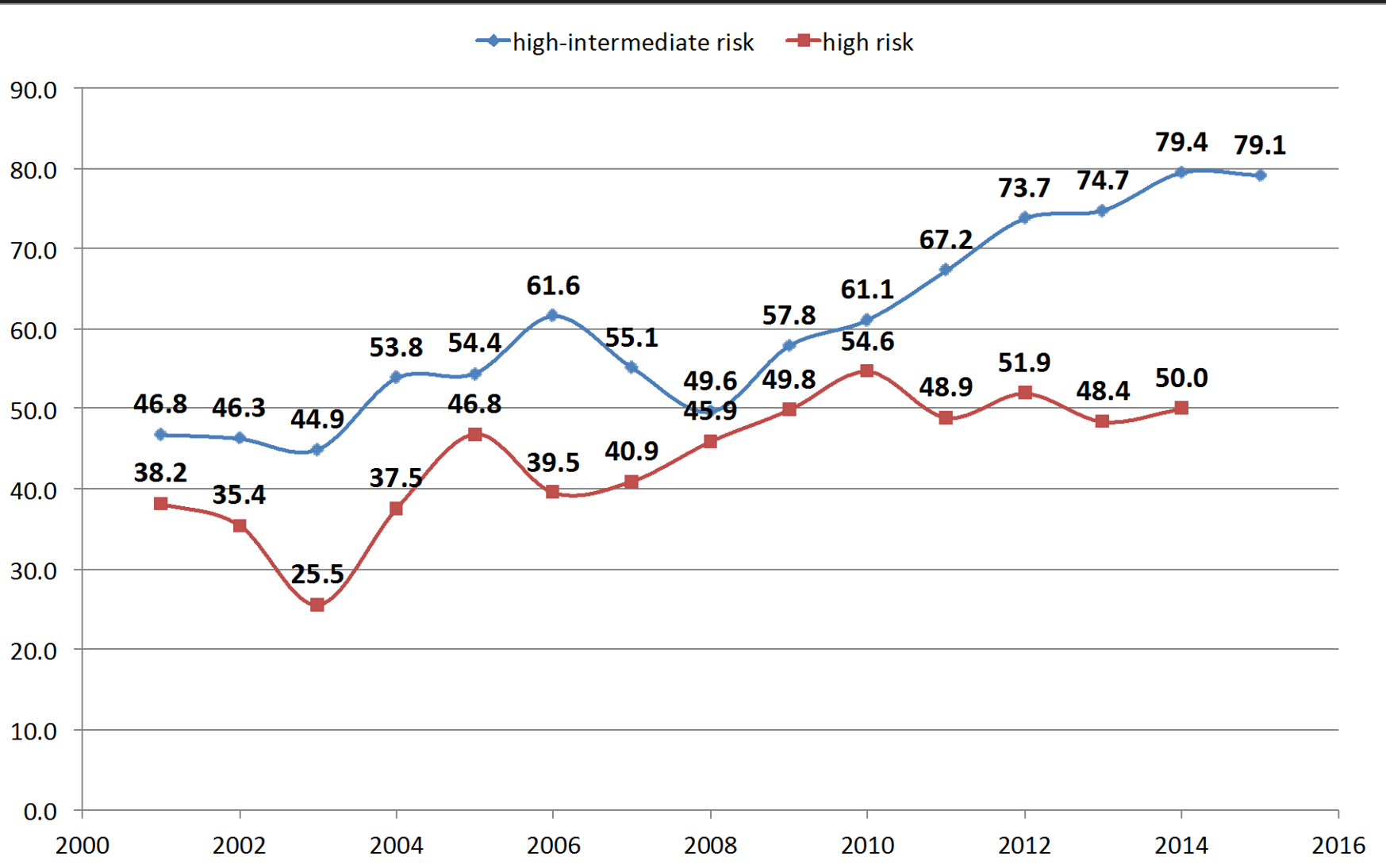


15- year outcomes after robot-assisted  
radical prostatectomy

**Cancer control**



# VUI: Trends in tumor profiles of PCa undergoing RARP



## Prostate Cancer

# Oncologic Outcomes at 10 Years Following Robotic Radical Prostatectomy

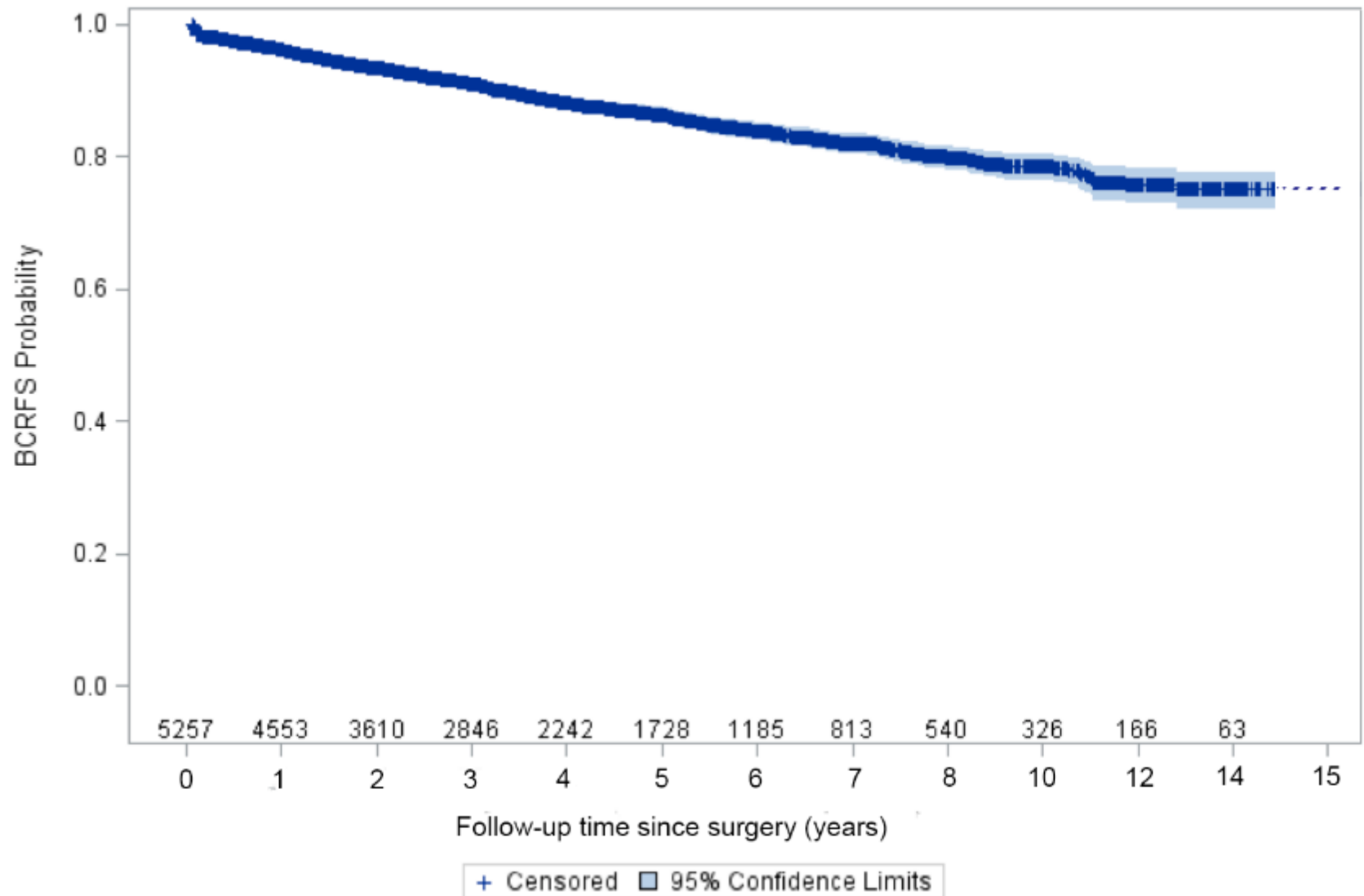
Mireya Diaz<sup>a,b,\*</sup>, James O. Peabody<sup>a</sup>, Victor Kapoor<sup>a</sup>, Jesse Sammon<sup>a</sup>, Craig G. Rogers<sup>a</sup>, Hans Stricker<sup>a</sup>, Zhaoli Lane<sup>c</sup>, Nilesh Gupta<sup>c</sup>, Mahendra Bhandari<sup>a</sup>, Mani Menon<sup>a,d</sup>

<sup>a</sup>Vattikuti Urology Institute, Henry Ford Hospital, Detroit, MI, USA; <sup>b</sup>Public Health Sciences, Henry Ford Hospital, Detroit, MI, USA; <sup>c</sup>Department of Pathology, Henry Ford Hospital, Detroit, MI, USA; <sup>d</sup>Case Western Reserve University, Cleveland, OH, USA; New York University, New York, NY, USA; University of Toledo School of Medicine, Toledo, OH, USA

**Results and limitations:** There were 108 patients with BCR at a median follow-up of 121 mo (interquartile range: 97–132). **Actuarial BCRFS, MFS, and CSS rates at 10 yr were 73.1%, 97.5%, and 98.8%, respectively.** On multivariable analysis, D'Amico risk groups or pathologic Gleason grade, stage, and margins were the strongest predictors of BCR depending on whether preoperative or postoperative variables were considered. The value of the detectable PSAs together with disease severity were independent predictors of receipt of salvage therapy, together with a persistent PSA for metastases.

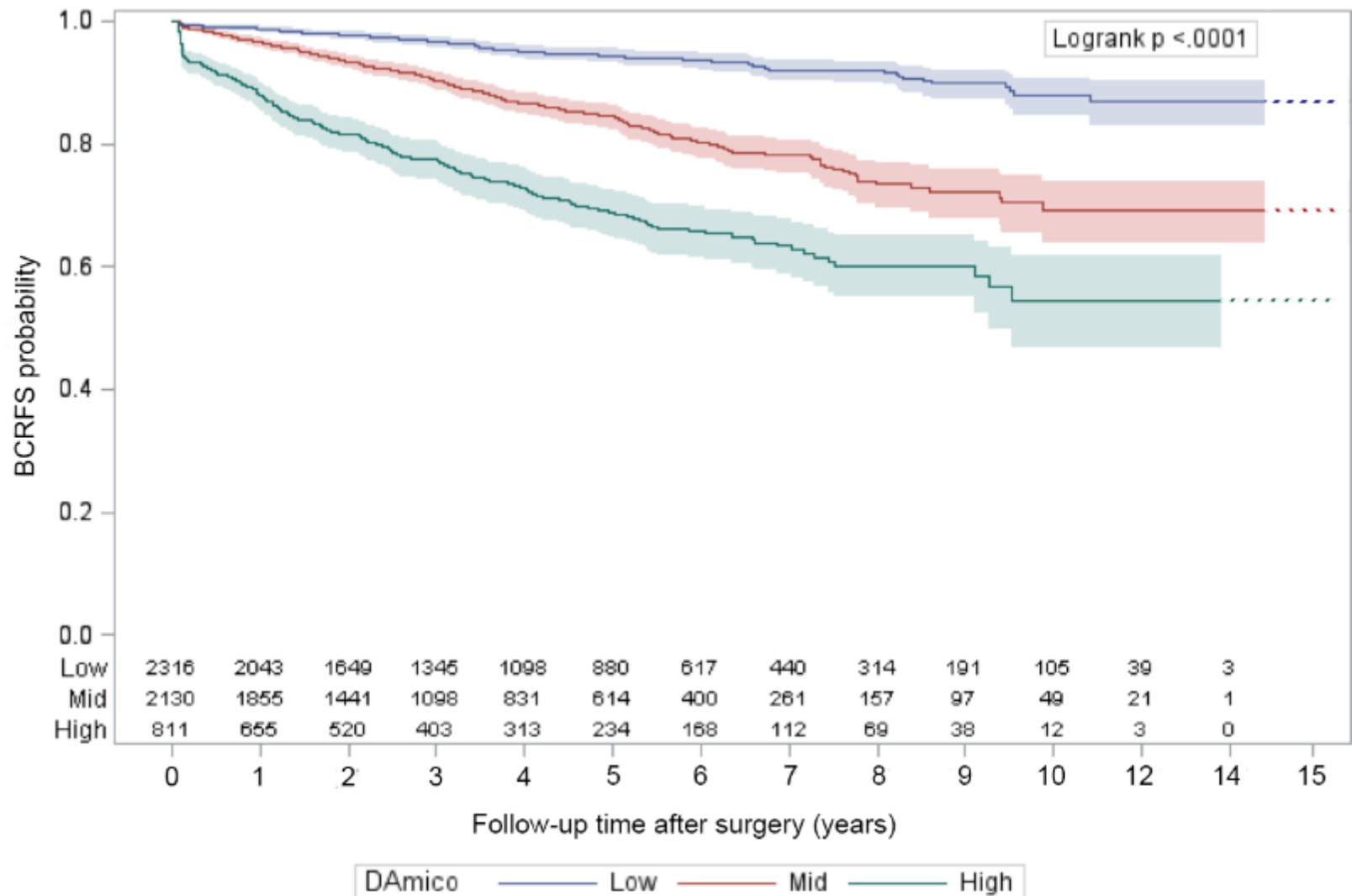
**Conclusions:** In contemporary patients with localized prostate cancer, RARP confers effective 10-yr cancer control. Disease severity and PSA measurements can be used to guide more personalized and cost-effective postoperative surveillance regimens.

# Overall Biochemical recurrence-free survival (BCRFS) for Clinically Localized Diseased after RARP (VUI)



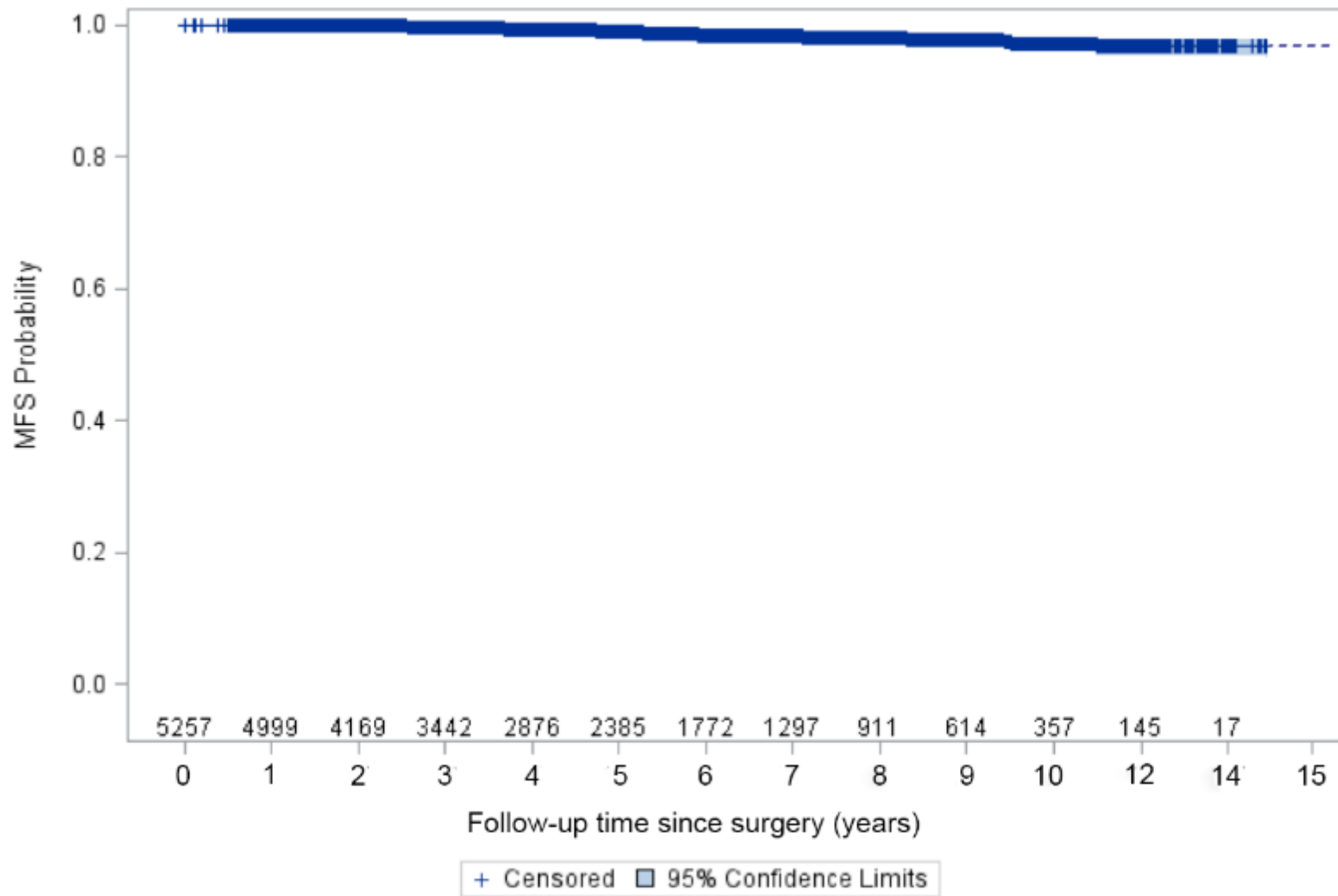
\* Unpublished data, VUI

# Biochemical recurrence-free survival (BCRFS) for Clinically Localized Diseased after RARP, stratified by D Amico risk group (VUI)



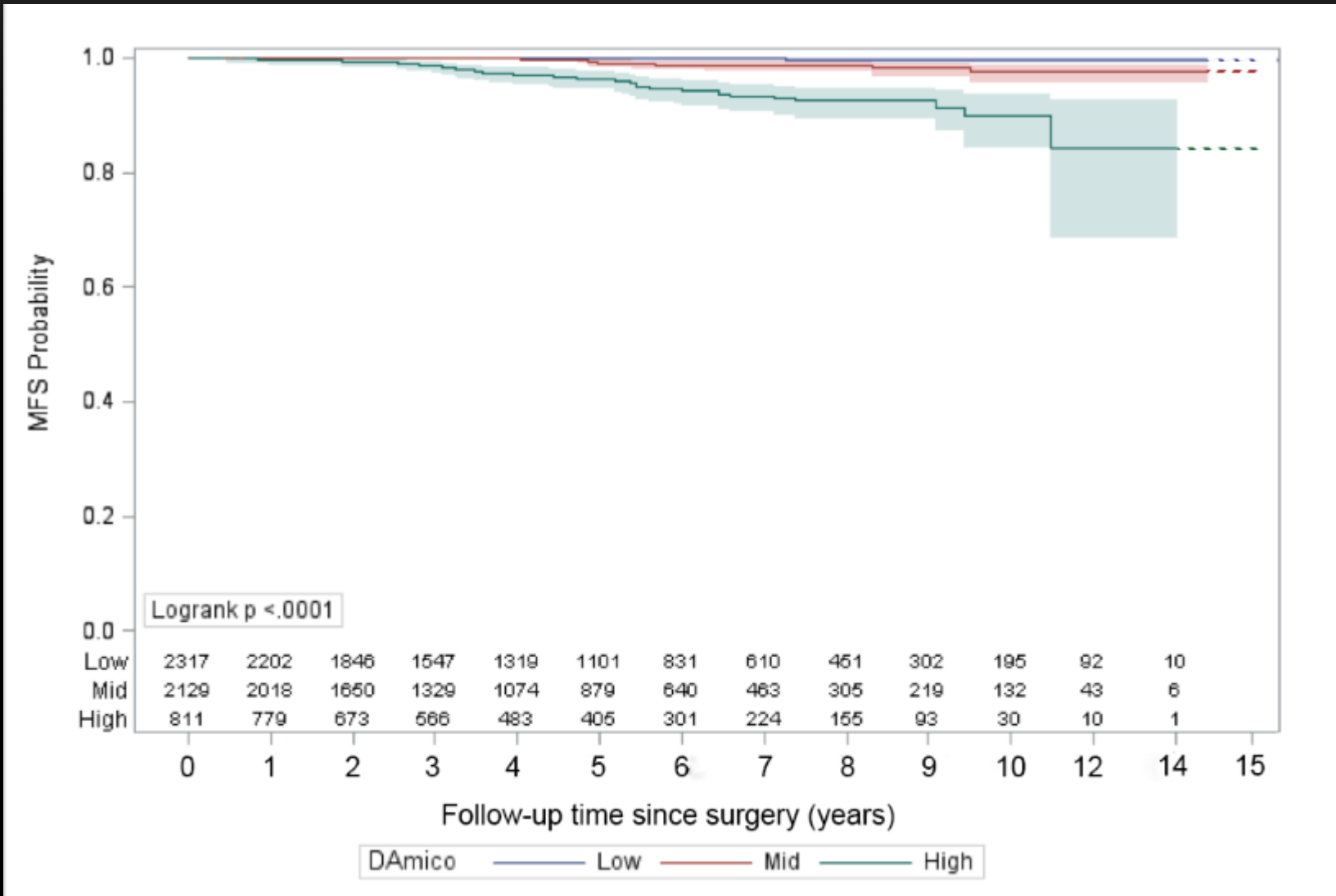
\* Unpublished data, VUI

# Overall Metastases-free survival (MFS) for Clinically Localized Diseased after RARP (VUI)



\* Unpublished data, VUI

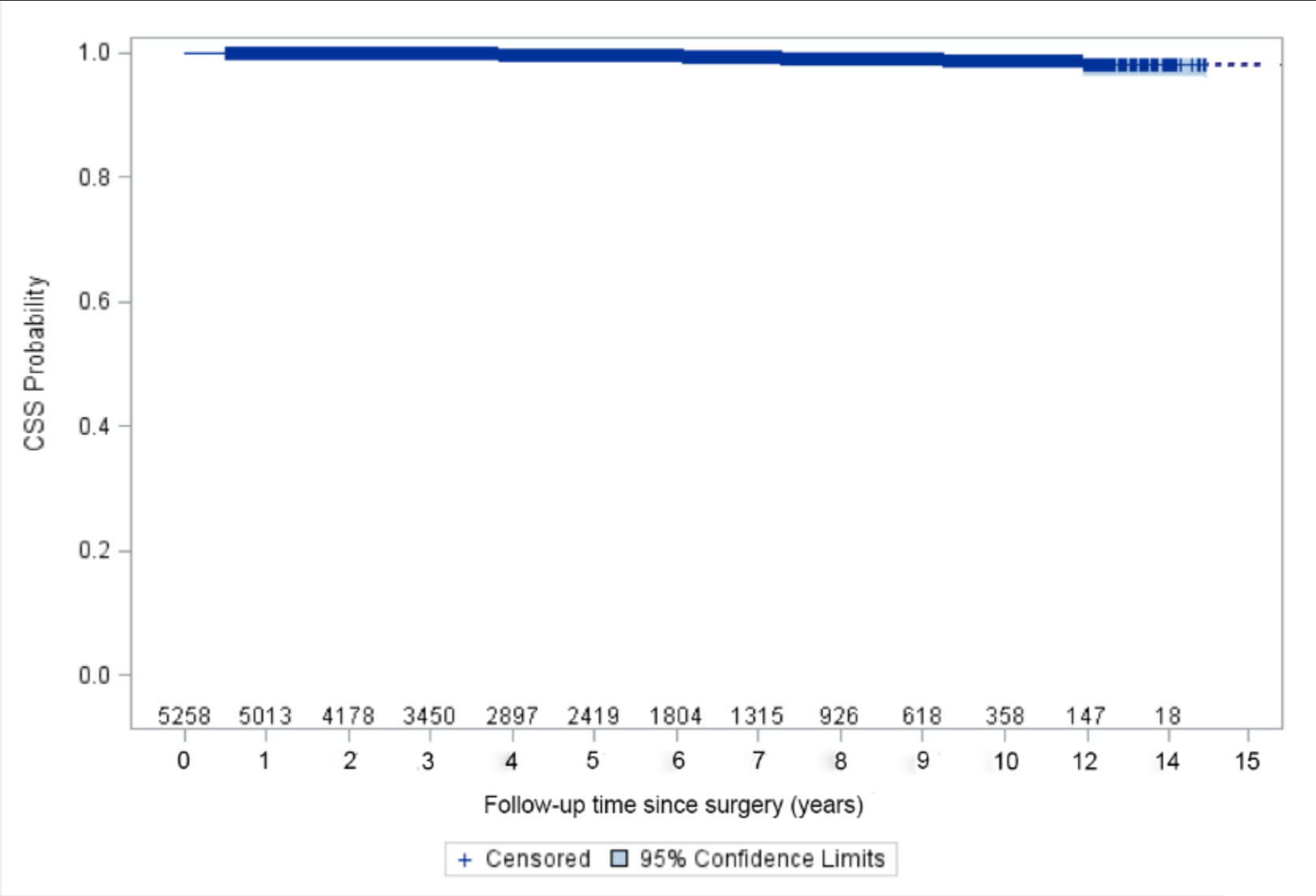
# Metastases-free survival (MFS) for Clinically Localized Diseased after RARP, stratified by D Amico risk group (VUI)



\* Unpublished data, VUI

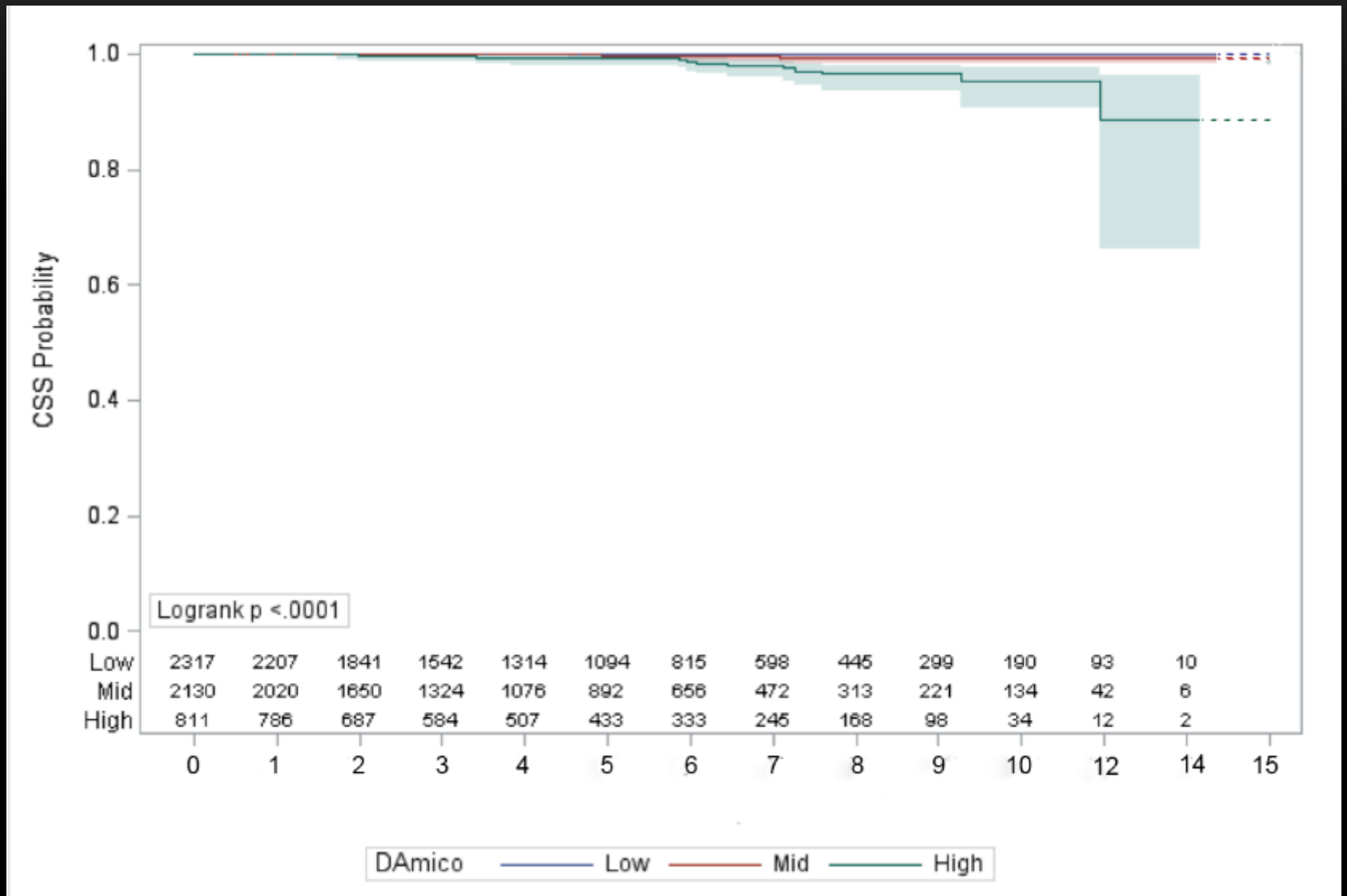


# Overall cancer specific survival (CSS) for Clinically Localized Diseased after RARP (VUI)



\* Unpublished data, VUI

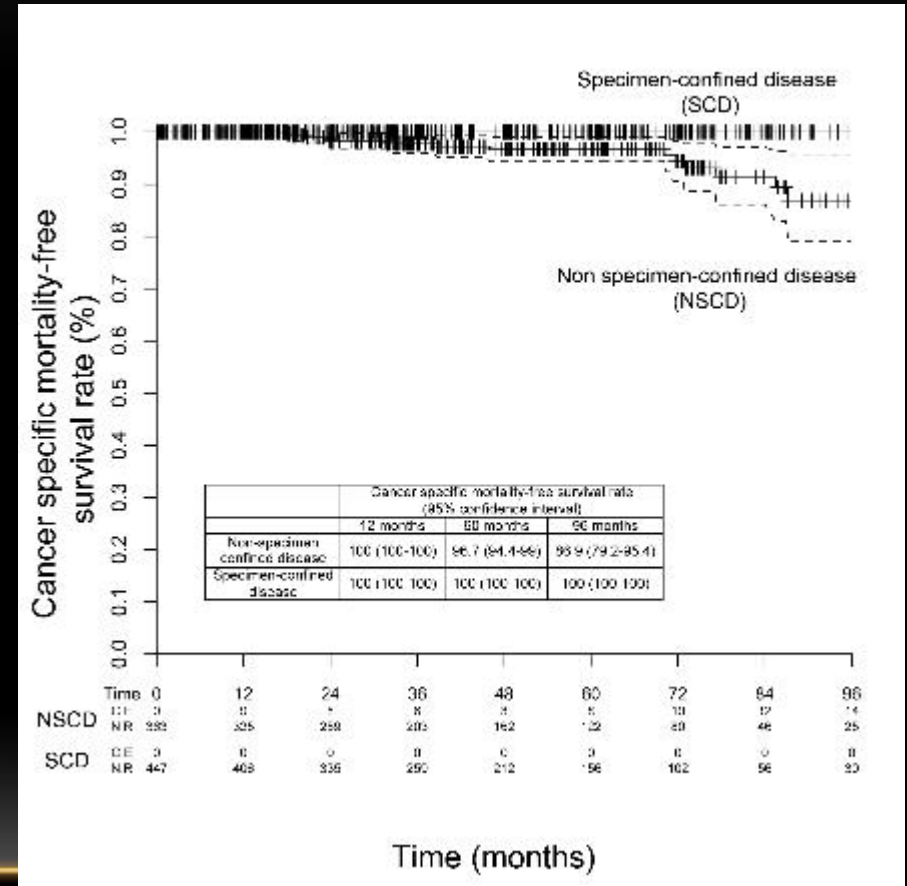
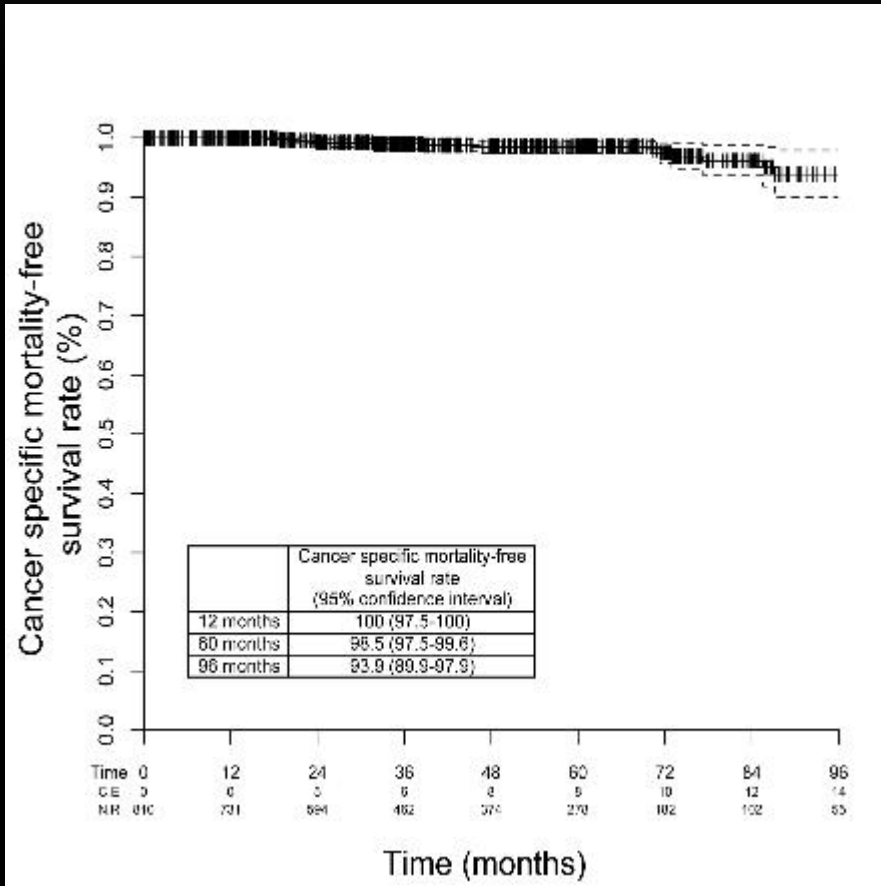
# Cancer specific survival (CSS) for Clinically Localized Diseased after RARP, stratified by D Amico risk group (VUI)



\* Unpublished data, VUI

# THE FUTURE OF PROSTATE CANCER SURGERY

## Cancer-specific survival

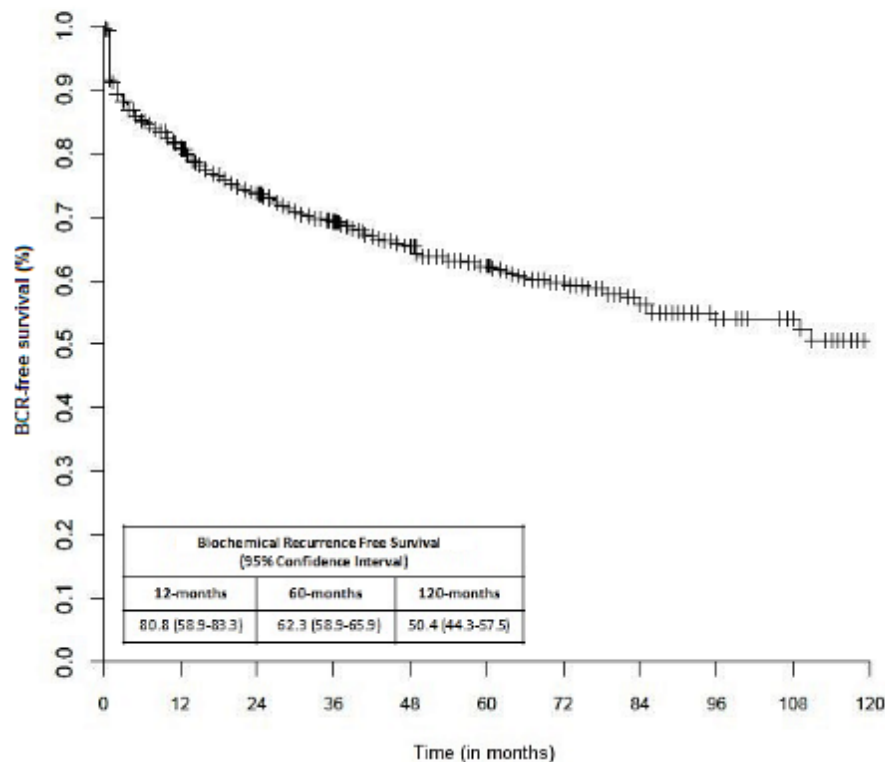


# THE FUTURE OF PROSTATE CANCER SURGERY

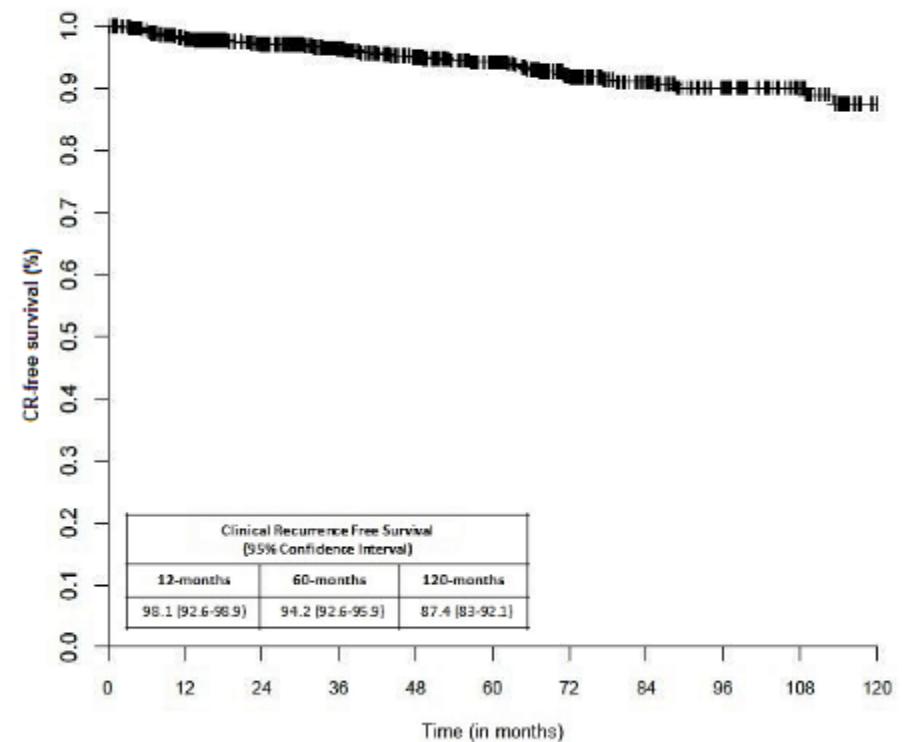
1100 patients with D Amico HIGH RISK PCa undergoing RARP, at three academic centers, between 2002 and 2013

## Biochemical recurrence and clinical recurrence free survival

BCR-free survival: Overall



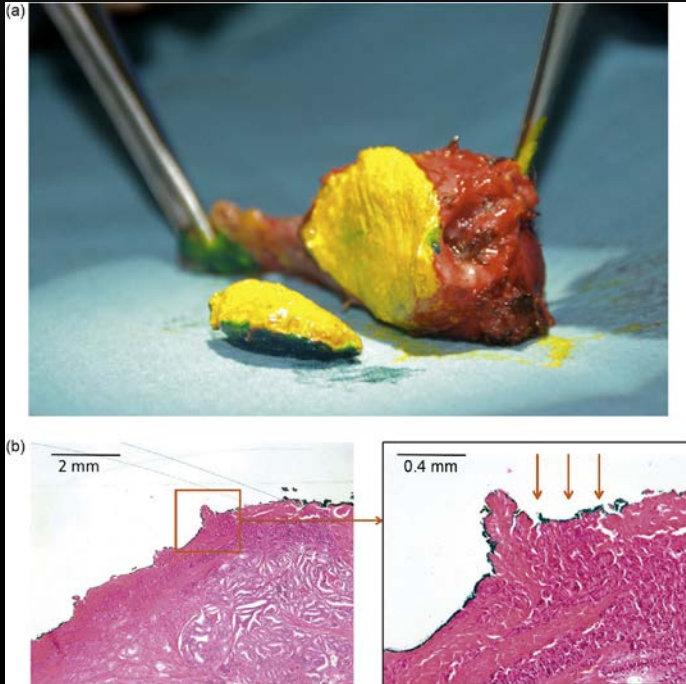
CR-free survival: Overall



NeuroSAFE

Improve  
Cancer  
control

MORE



PSM rate dropped significantly with NeuroSAFE (overall 16% vs 24%)

Absolute risk reduction by 26.6% in PSM rate in patients with pT3a disease.

Schlomm et al. Eur Urol. 2012 Aug;62(2):333-40.  
Beyer et al. Eur Urol. 2014 Jul;66(1):138-44.

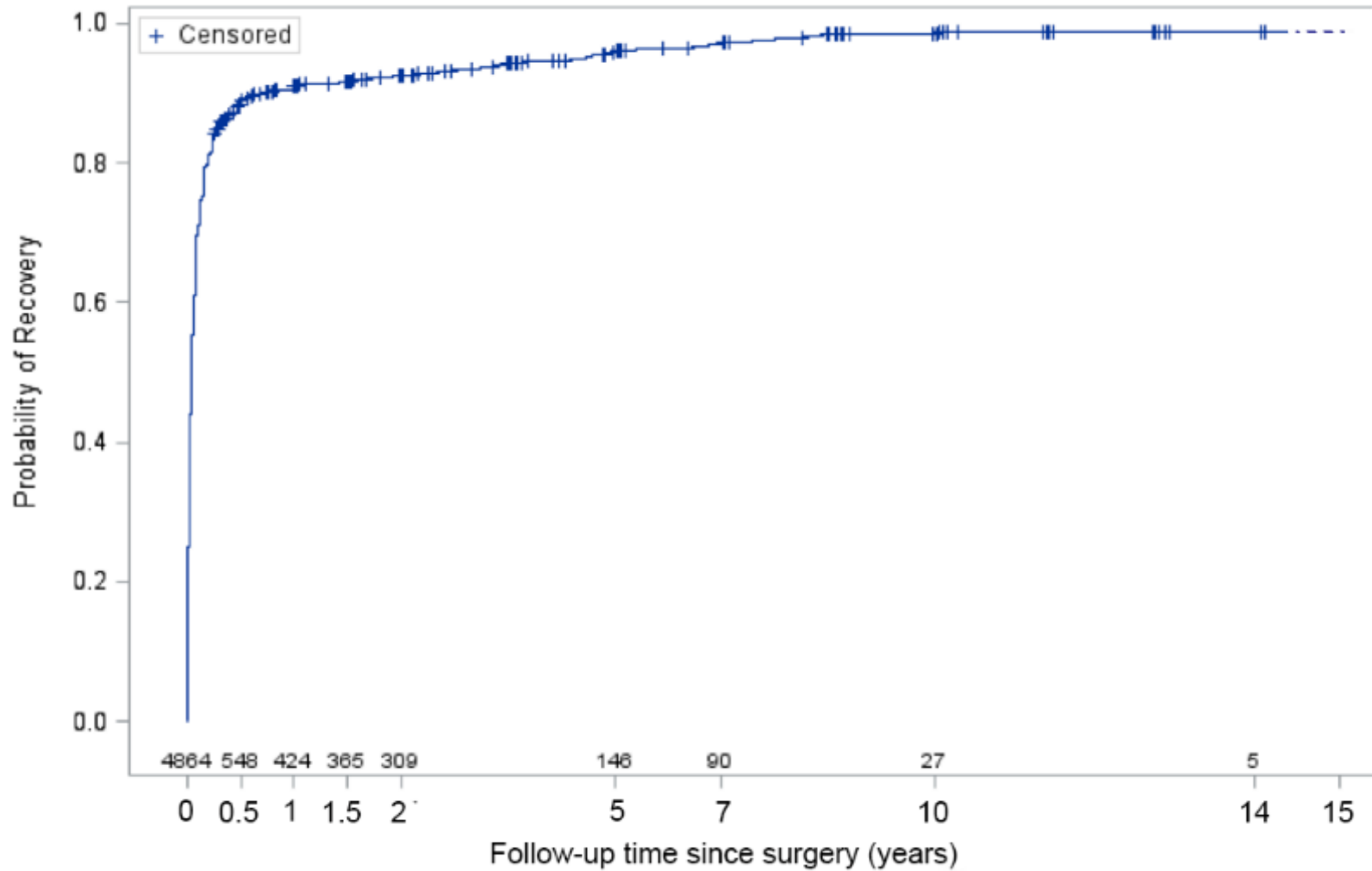
Jeong et al. BJU Int. 2014 Dec;114(6):955-7



VUI: 15- year outcomes after robot-assisted radical prostatectomy

# Continence

# Continence (0-1 pads) after Robot-assisted radical prostatectomy (VUI)



\* Unpublished data, VUI

## Improve Continence

Suprapubic tube

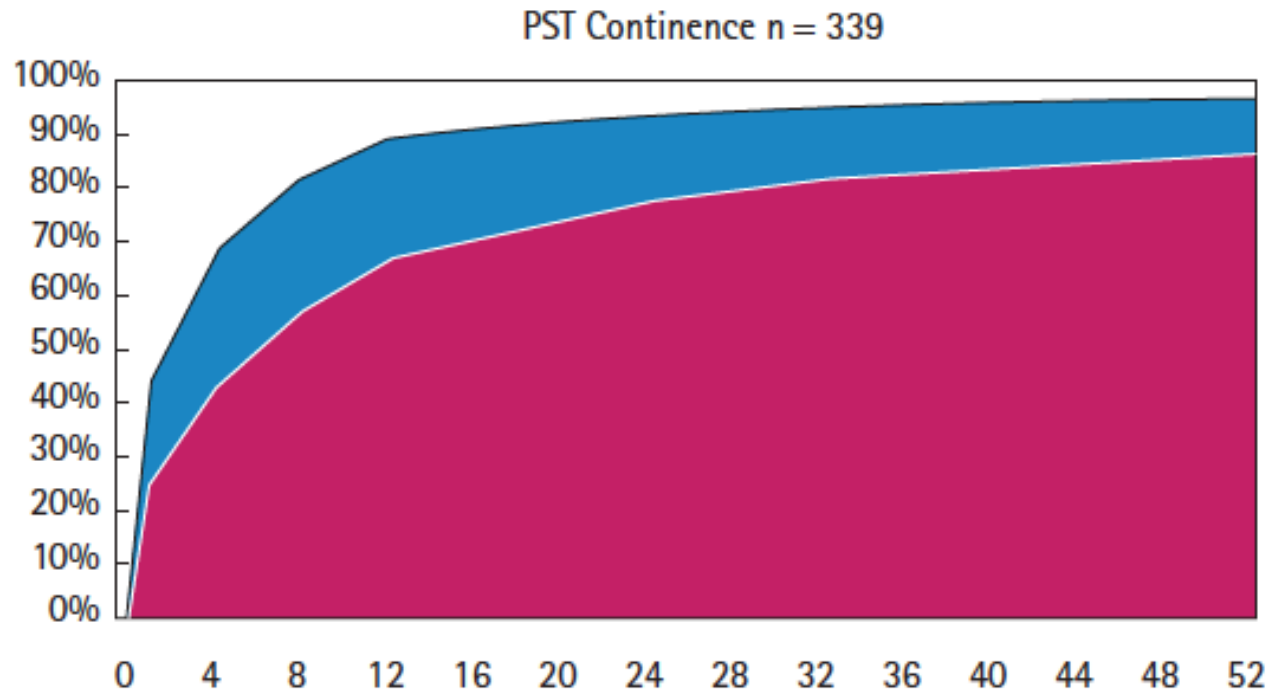
~98 % patients achieved social  
continence by 1 yr follow-up.

Retzius sparing  
prostatectomy

~90% patients achieved social  
continence (0-1 pad); 1 week post  
catheter removal

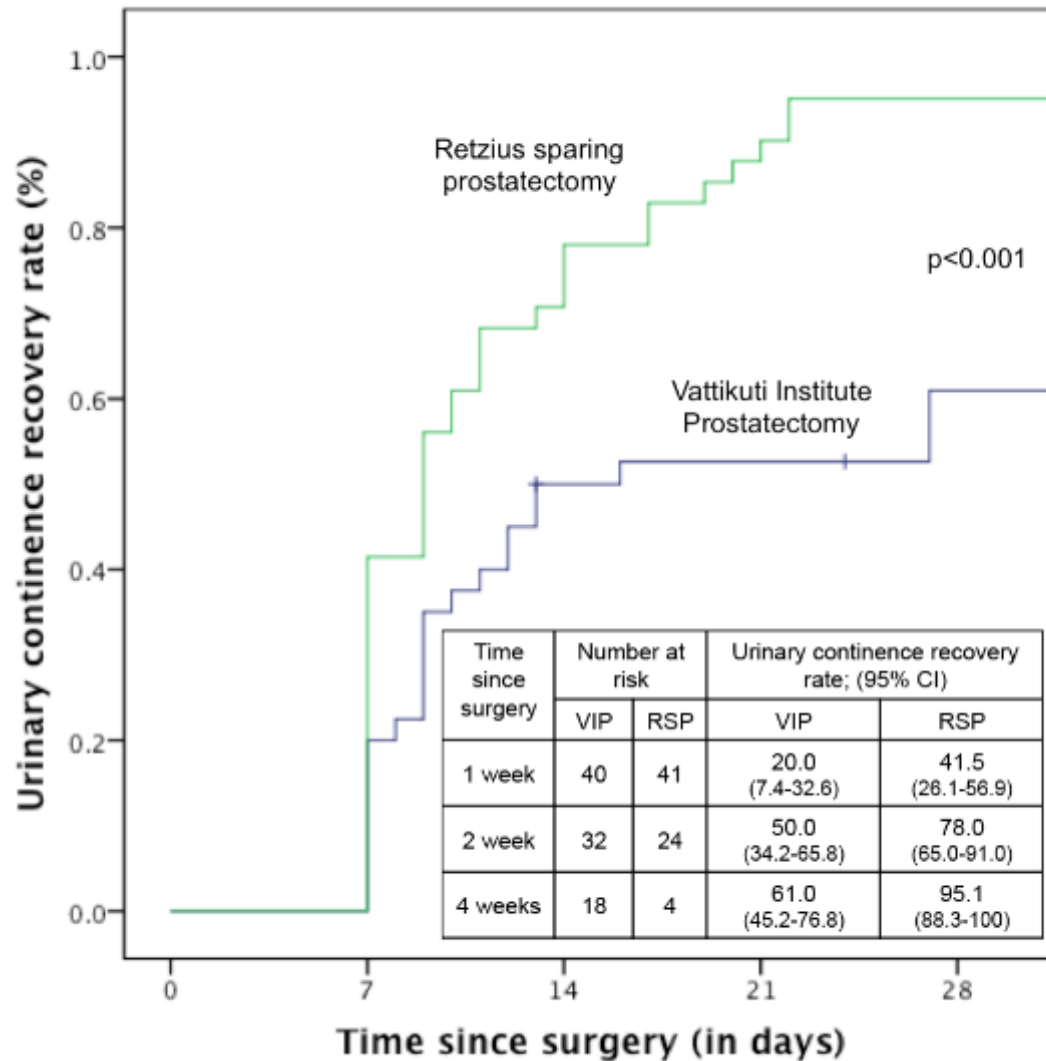
## Recovery of urinary continence with and without PST

FIG. 2. Continence outcomes at 1 year after PST bladder drainage after UVA. The median time to 0-1 pad/day was 2 weeks; median time to total urinary control was 6 weeks.



|                          | 0 | 1    | 4    | 8    | 12   | 24   | 32   | 52   |
|--------------------------|---|------|------|------|------|------|------|------|
| 0-1 pad/day, %           | 0 | 44.2 | 68.7 | 82.6 | 90.0 | 93.8 | 95.6 | 97.3 |
| Total Urinary Control, % | 0 | 25.4 | 43.1 | 57.2 | 67.0 | 77.9 | 82.0 | 86.4 |

# Recovery of social continence (0-1 pad per day); VIP vs. RSP





# RCT: RETZIUS SPARING VS. CONVENTIONAL RARP (IDEAL PHASE 3)

**ClinicalTrials.gov**

A service of the U.S. National Institutes of Health

**Comment Period Extended to 3/23/2015** for Notice of Proposed Rulemaking (NPRM) for FDAAA 801 and NIH Draft Reporting Policy for NIH-Funded Trials

Trial record **1 of 1** for: NCT02352103

[Previous Study](#) | [Return to List](#) | [Next Study](#)

## Impact of Robot-assisted Radical Prostatectomy Technique on Short-term Continence Recovery

**This study is currently recruiting participants.** (see [Contacts and Locations](#))

*Verified January 2015 by Henry Ford Health System*

**Sponsor:**

Henry Ford Health System

**Information provided by (Responsible Party):**

Mani Menon, Henry Ford Health System

**ClinicalTrials.gov Identifier:**

NCT02352103

First received: January 22, 2015

Last updated: January 27, 2015

Last verified: January 2015

[History of Changes](#)

[Full Text View](#)

[Tabular View](#)

[No Study Results Posted](#)

[Disclaimer](#)

[How to Read a Study Record](#)

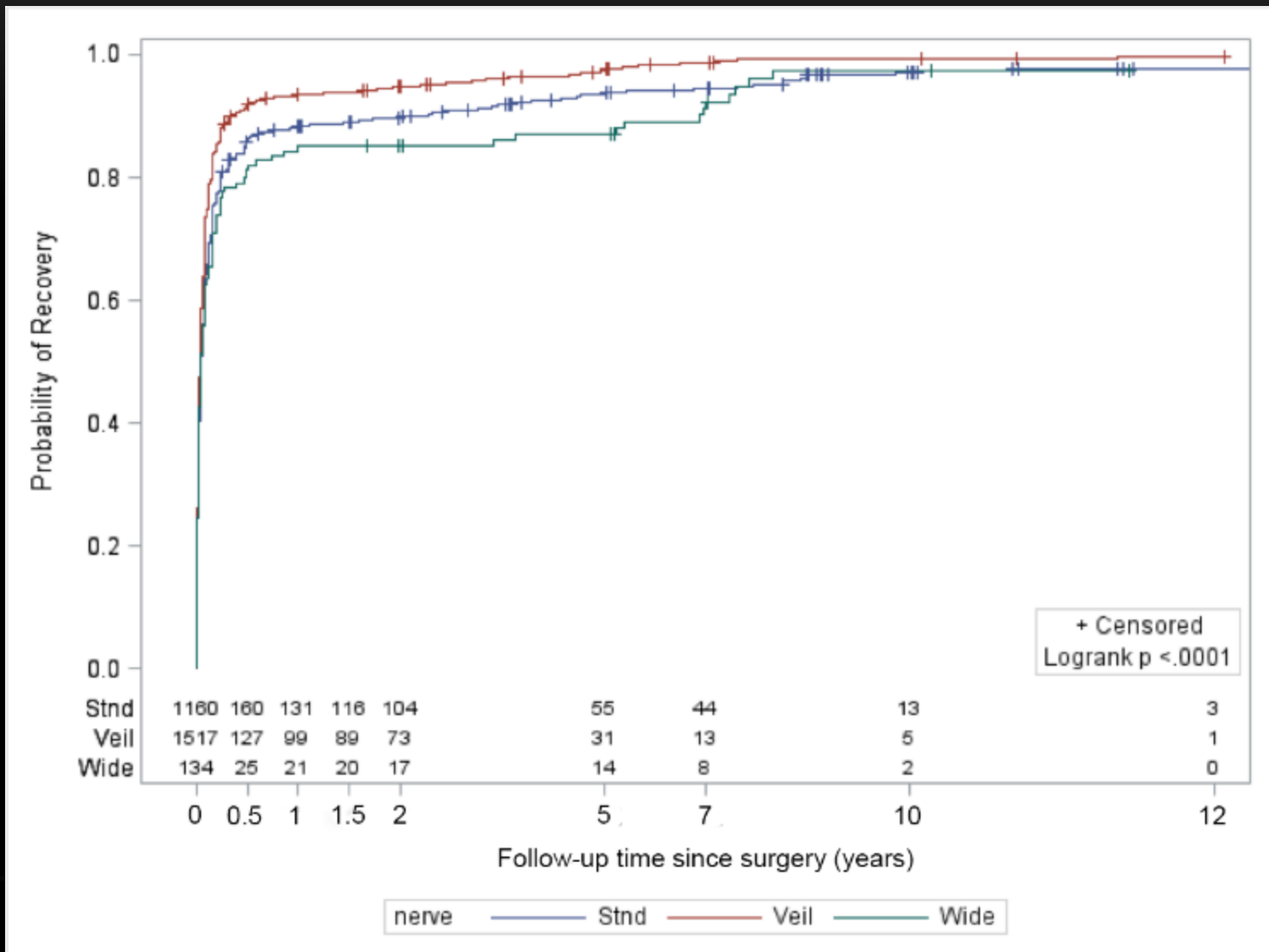
### Purpose

To assess and compare the short-term post-operative continence recovery rate in two cohorts of men undergoing Robot Assisted Radical Prostatectomy (RARP), each randomized to undergo RARP with Vattikuti Institute technique or Retzius sparing technique.

VUI: 15- year outcomes after robot-assisted radical prostatectomy

**Potency**

# Continence (0-1 pads) after Robot-assisted radical prostatectomy , stratified by Nerve Sparing\*



\* Unpublished data, VUI

Improve  
erectile  
function

Intra-operative ICI

Chorionic  
membrane

Faster return to potency (SHIM>19)  
with chorio-allantoic graft (1.34 mo),  
compared to without (3.39 mo;  
 $p=0.007$ )

## Platinum Priority – Prostate Cancer

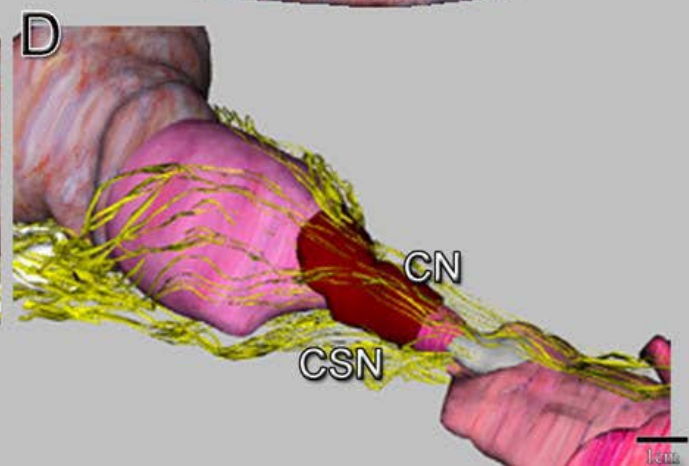
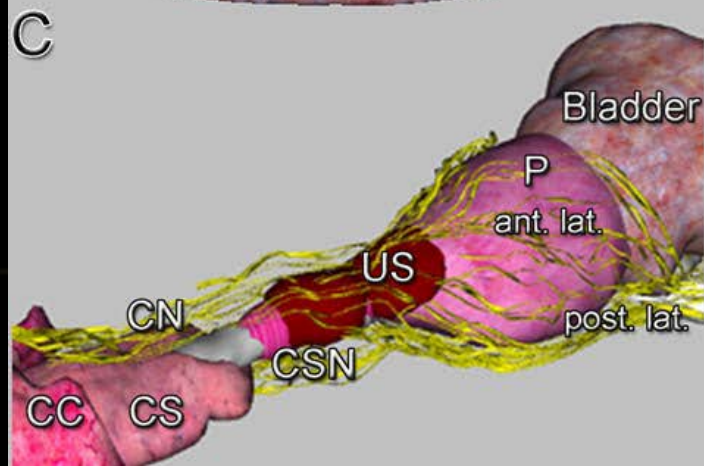
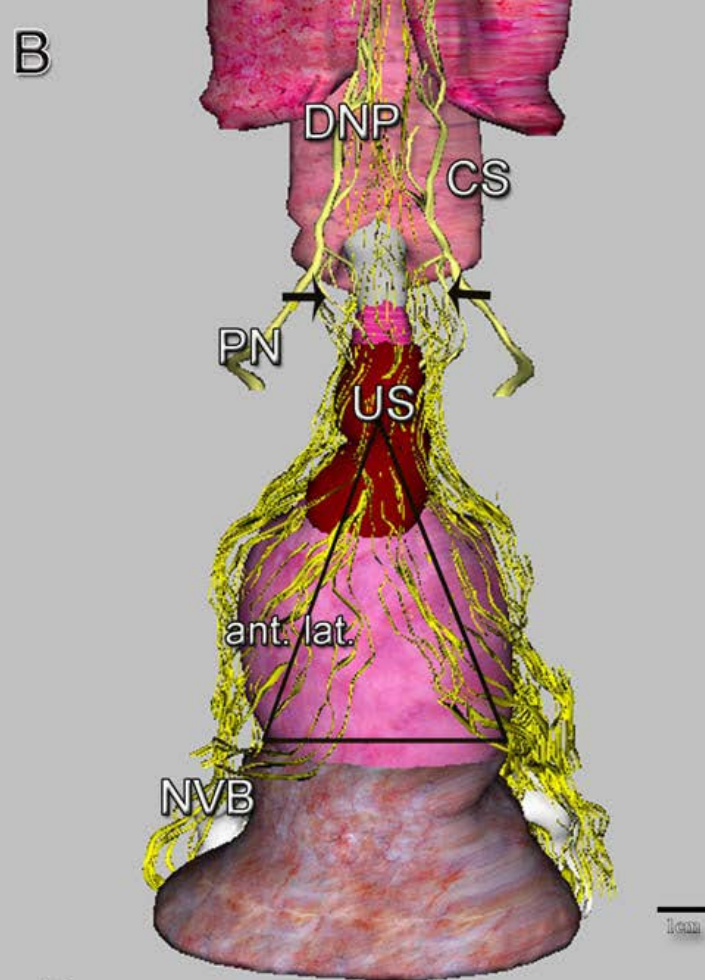
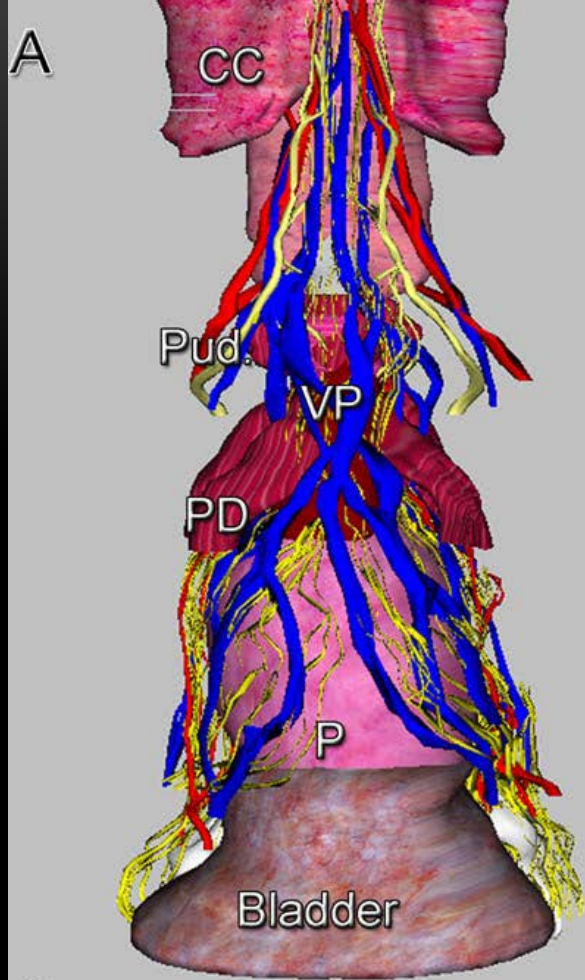
*Editorial by Robert P. Myers on pp. 910–911 of this issue*

# Division of Autonomic Nerves Within the Neurovascular Bundles Distally into Corpora Cavernosa and Corpus Spongiosum Components: Immunohistochemical Confirmation with Three-Dimensional Reconstruction

*Bayan Alsaïd<sup>\*</sup>, Thomas Bessedè, Djibril Diallo, David Moszkowicz, Ibrahim Karam, Gérard Benoit, Stéphane Droupy*

*Laboratory of Experimental Surgery, EA 4122, Faculty of Medicine, Bicêtre-Paris 11 University, Le Kremlin-Bicêtre, France*

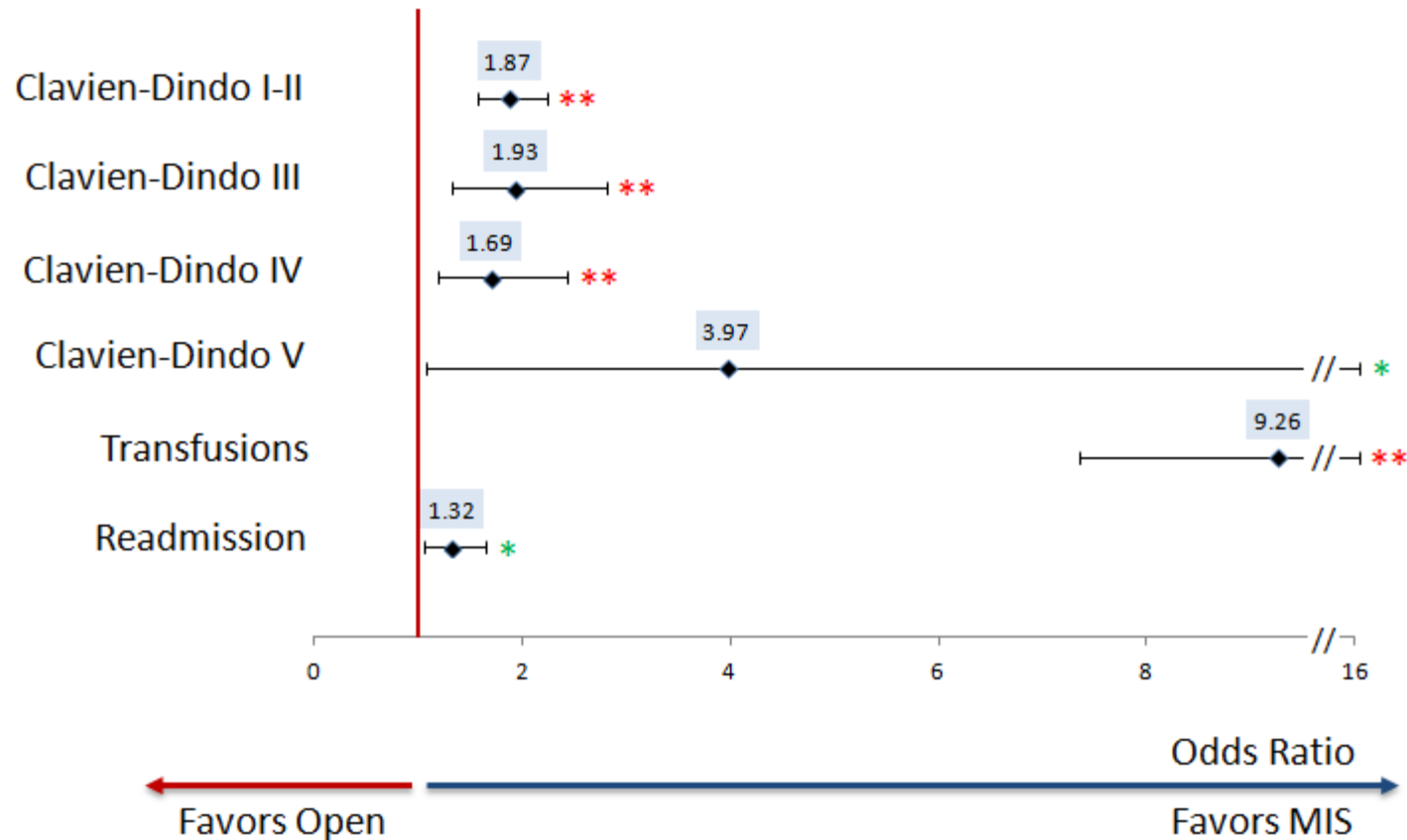
“At the prostate apex and the urethral levels, the NVBs have two divisions: **cavernous nerves (CNs) and corpus spongiosum nerves (CSNs)**. The **CNs** were a continuation of **the anterior and anterolateral fibres** around the apex of the prostate, travelling towards the corpora cavernosa. The **CSNs** were a continuation of the **posterolateral NVBs**, and they eventually reached the corpus spongiosum.”





# Minimally invasive surgery: Superior perioperative outcomes?

## Prostatectomy



Unpublished data. Based on 5,500 propensity matched patients, ACS-NSQIP 2005-13.



Vattikuti Urology Institute

# Predictions (2005)

1. "Robotics will become more popular."
  1. "As the robot is replaced by its sons and daughters, cost will decrease."
  1. "Younger generations will be more comfortable with the robot."
-

# A Decade of Follow-up: Robotic Prostatectomy What have we learnt?

1. Over 95% of patients these days choose robotic prostatectomy.  
Yet, debate about its benefit still continues.
2. No da Vinci offsprings as yet. Cost is still high.
3. Outcomes appear better than with open surgery.
4. Cancer control and continence are excellent. However, ED remains an issue.



Vattikuti Urology Institute



First case of robot assisted radical prostatectomy: **Nov 29, 2000**

Total number of robot-assisted radical prostatectomies: **>8,000**

Surgeons: **6**

Trainees: **32**



# Our people and our home



The VCORE office



Dr Mireya Insua Diaz, head of biostatistics



Quoc-Dien Trinh,  
Brigham and  
Women's hospital




 Volume 25 | Number 1 | February 2013

**EUROPEAN**  
 European Urology  
 Together **UROLOGY**



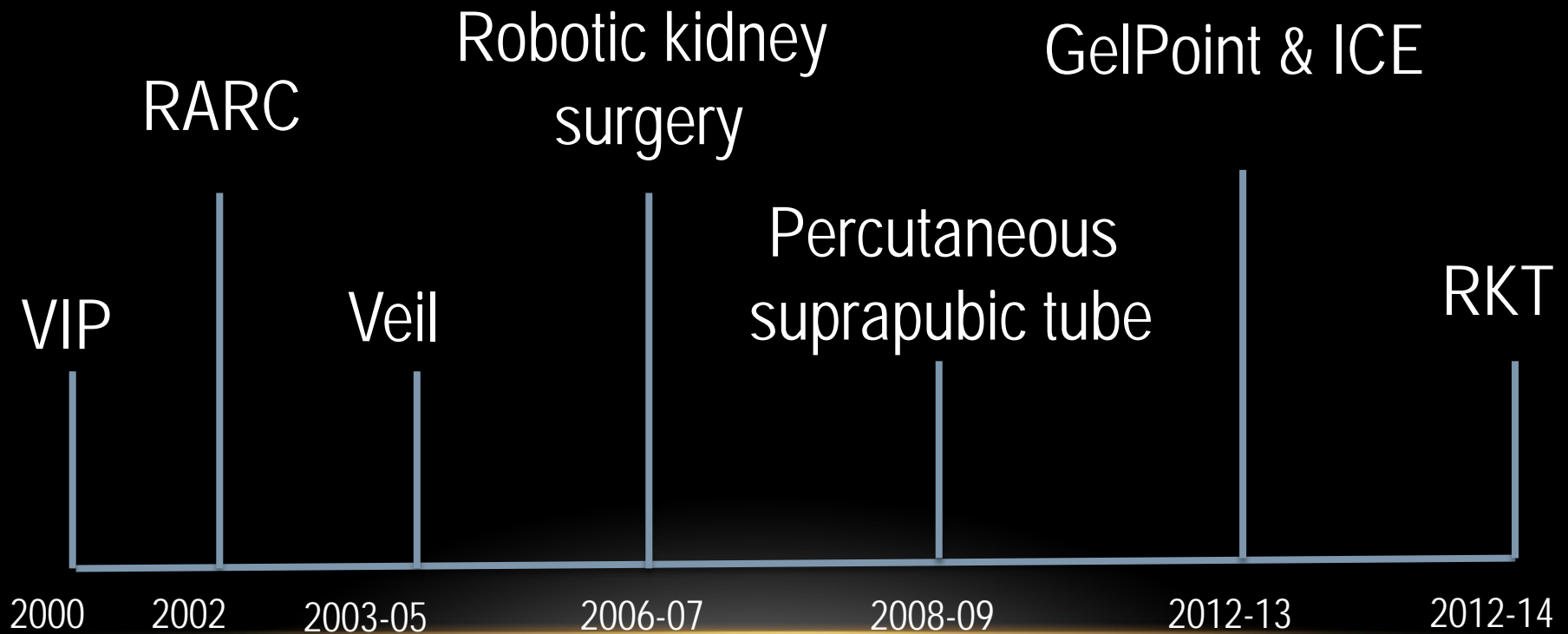
**ISSN 0974-8375**  
 The Official European Urology Journal of the European Association of Urologists (EAU) and the European Society of Urology (ESU).  
 Founded in 1972, the journal is published by Springer and is the leading international journal in the field of urology.


 Impact Factor 12.480

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**2013 Impact Factor 12.480**

*The journey from fall of 2000 to the spring of 2014 has been a process of learning, of informed conjecture, and above all, the will to do the same thing a 1000 times and yet not be afraid to change it...*



# PSA SCREENING FOR PROSTATE CANCER: AUA GUIDELINES

Age <40 : No screening

Age 40-54: No routine screening for men at average risk; individualize decisions for men at higher risk

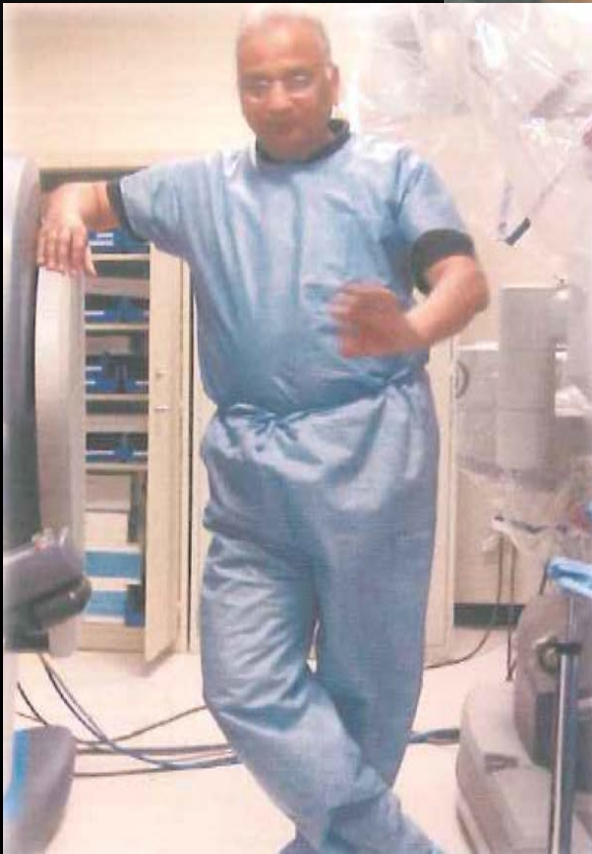
Age 55-69: Screen only after shared decision making

Ages 70+ or those with LE <10-15 years: No routine screening

In those who choose to undergo screening after shared decision making, screen bi-annually to reduce harms of overdiagnosis and overtreatment



# ROBOTICS IN KIDNEY SURGERY



## Laparoscopy

# Da Vinci-Assisted Robotic Partial Nephrectomy: Technique and Results at a Mean of 15 Months of Follow-Up

*Sanjeev Kaul\**, Rajesh Laungani, Richard Sarle, Hans Stricker, James Peabody, Ray Littleton, Mani Menon

Vattikuti Urology Institute, Henry Ford Hospital, Detroit, MI, USA

**Table 2 - Comparison of contemporary series of robotic partial nephrectomy**

| Series          | No. of patients | Mean tumor size, cm | Operative time, min | Warm ischemia time, min | Median hospital stay, d | Mean blood loss, ml | Mean Follow-up, mo | Recurrence |
|-----------------|-----------------|---------------------|---------------------|-------------------------|-------------------------|---------------------|--------------------|------------|
| Gettman et al.  | 13              | 3.5                 | 215                 | 22                      | 4.3                     | 170                 | NR                 | NR         |
| Phillips et al. | 12              | 1.4                 | 265                 | 26                      | 2.7                     | 240                 | NR                 | NR         |
| Present study   | 10              | 2.3                 | 155                 | 21                      | 1.5                     | 92                  | 15                 | 0          |

NR = not reported.



TOPIC PAPER

Ketan K. Badani · Ashok K. Hemal · Michael Fumo  
Sanjeev Kaul · Alok Shrivastava  
Arumuga Kumar Rajendram · Noor Ashani Yusoff  
Murali Sundram · Susan Woo · James O. Peabody  
Sahabudin Raja Mohamed · Mani Menon

## Robotic extended pyelolithotomy for treatment of renal calculi: a feasibility study



Case Series of the Month

# Robotic Partial Nephrectomy with Cold Ischemia and On-clamp Tumor Extraction: Recapitulating the Open Approach

Craig G. Rogers\*, Khurshid R. Ghani, Ramesh K. Kumar, Wooju Jeong, Mani Menon

Vattikuti Urology Institute, Henry Ford Hospital, Detroit, MI, USA

## Article info

### Article history:

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Published online ahead of print on November 19, 2012

### Keywords:

Robotic partial nephrectomy

Ischemia

Kidney cancer

Hypothermia

**EU \* ACME**

www.eu-acme.org/

europeanurology

## Abstract

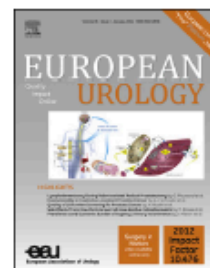
We describe a reproducible technique for achieving cold ischemia with intraoperative tumor assessment during robotic partial nephrectomy (RPN) that recapitulates the open approach: **intracorporeal cooling and extraction (ICE).**

A total of seven patients underwent the ICE modification of RPN by transperitoneal ( $n = 5$ ) and retroperitoneal ( $n = 2$ ) approaches. A Gelpoint access port was used for the camera and assistant ports. Following hilar clamping, ice slush was introduced through the Gelpoint via syringes and applied over the kidney surface. The excised tumor was immediately extracted through the Gelpoint, allowing gross margin assessment by pathology during the renorrhaphy.

RPN was achieved in all cases with successful introduction of ice slush and tumor extraction while on clamp. Median RENAL nephrometry score was 8 (range: 6–10), and there was one solitary kidney. **Mean cold ischemia time was 19.6 min (range: 8–37) and mean estimated blood loss was 296.4 ml (range: 50–1000). Renal parenchymal temperatures  $< 16^\circ\text{C}$  were achieved within 7 min of cold ischemia** and there was no drop in core body temperature  $> 0.5^\circ\text{C}$  during any procedures. Intraoperative assessment of the excised tumor showed adequate gross margins in all cases and **final pathology confirmed negative surgical margins.**

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## Renal Disease

# Robotic Kidney Transplantation with Regional Hypothermia: Evolution of a Novel Procedure Utilizing the IDEAL Guidelines (IDEAL Phase 0 and 1)

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## Surgery in Motion

# Robotic Kidney Transplantation with Regional Hypothermia: A Step-by-step Description of the Vattikuti Urology Institute–Medanta Technique (IDEAL Phase 2a)

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# ROBOTICS IN BLADDER SURGERY



University of Monsoura, Egypt 2003

# Nerve-sparing robot-assisted radical cystoprostatectomy and urinary diversion

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## OBJECTIVE

To develop a technique of nerve-sparing robot-assisted radical cystoprostatectomy (RRCP) for patients with bladder cancer.

## PATIENTS AND METHODS

Robotic assistance should enhance the ability to preserve the neurovascular bundles during laparoscopic radical cystectomy. Thus we undertook RRCP and urinary diversion using a three-step technique. First, using a six-port approach and the da Vinci Surgical System (Intuitive Surgical, Sunnyvale, CA, USA), one surgeon carried out a complete pelvic lymphadenectomy and cystoprostatectomy using a technique developed specifically for robotic surgery. The neurovascular bundles were easily identified and dissected away, the specimen entrapped in a bag and removed

through a 5–6 cm suprapubic incision. Second, a different surgical team exteriorized the bowel through this incision and created a neobladder extracorporeally. Third, the neobladder was internalized, the incision closed and the primary surgeon completed the urethro-neovesical anastomosis with robotic assistance.

## RESULTS

RRCP was carried out in 14 men and three women by the primary surgeon (M.M.). The form of urinary reconstruction was ileal conduit in three, a W-pouch with a serosal-lined tunnel in 10, a double-chimney or a T-pouch with a serosal-lined tunnel in two each. The mean operative duration for robotic radical cystectomy, ileal conduit and orthotopic neobladder were 140, 120 and 168 min, respectively. The mean blood loss

was <150 mL. The number of lymph nodes removed was 4–27, with one patient having N1 disease. The margins of resection were free of tumour in all patients.

## CONCLUSIONS

We developed a technique for nerve-sparing RRCP using the da Vinci system which allows precise and rapid removal of the bladder with minimal blood loss. The bowel segment can be exteriorized and the most complex form of orthotopic bladder can be created through the incision used to deliver the cystectomy specimen. Performing this part of the operation extracorporeally reduced the operative duration.

## KEYWORDS

robot, laparoscopy, bladder carcinoma, radical cystectomy, urinary diversion

## **Robotic radical cystectomy and urinary diversion in the management of bladder cancer.**

Hemal AK<sup>1</sup>, Abol-Enein H, Tewari A, Shrivastava A, Shoma AM, Ghoneim MA, Menon M.

### **+ Author information**

#### **Abstract**

The authors have explored the versatility of the da Vinci robot for pelvic surgery to develop the technique of robotic radical cystectomy in conjunction with the Urology and Nephrology Center in Mansoura, Egypt, a world leader in conventional (open) cystectomy. This approach, which is designed to minimize the time required for surgery, is a sandwich technique in which the cystectomy and the neobladder-urethral anastomosis are performed with robotic assistance and the urinary diversion is performed extracorporeally. This article reviews the published literature and details the authors' current technique of robotic radical cystectomy and urinary diversion.

PMID: 15474598 [PubMed - indexed for MEDLINE]

## **Robot-assisted radical cystectomy and urinary diversion in female patients: technique with preservation of the uterus and vagina.**

Menon M<sup>1</sup>, Hemal AK, Tewari A, Shrivastava A, Shoma AM, Abol-Ein H, Ghoneim MA.

### **+ Author information**

#### **Abstract**

**BACKGROUND:** After performing more than 500 robotic radical prostatectomy and robotic radical cystoprostatectomy in men, we attempted to develop the technique of robot-assisted radical cystectomy in women. This article describes two techniques of robot-assisted radical cystectomy for women, conventional and with preservation of the uterus and vagina. To the best of our knowledge, this is the first case series of robot-assisted radical cystectomy and urinary diversion in women.



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## Bladder Cancer

# Long-term Oncologic Outcomes Following Robot-assisted Radical Cystectomy: Results from the International Robotic Cystectomy Consortium

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**Results and limitations:** Pathologic organ-confined (OC) disease was found in 62% of patients. Soft tissue surgical margins (SMs) were positive in 8%. Median lymph node (LN) yield was 16, and 21% of patients had positive LNs. Median follow-up was 67 mo (interquartile range: 18–84 mo). Five-year RFS, CSS, and OS were 67%, 75%, and 50%, respectively. Non-OC disease and SMs were associated with poorer RFS, CSS, and OS on multivariable analysis. Age predicted poorer CSS and OS. Adjuvant chemotherapy and positive SMs were predictors of RFS (hazard ratio: 3.20 and 2.16;  $p < 0.001$  and  $p < 0.005$ , respectively). Stratified survival curves demonstrated poorer outcomes for positive SM, LN, and non-OC disease. Retrospective interrogation and lack of contemporaneous comparison groups that underwent open radical cystectomy were major limitations.

**Conclusions:** The largest multi-institutional series to date reported long-term survival outcomes after RARC.

# VIDEO CLIP OF INTRA-CORPOREAL DIVERSION