

LA ROBOTICA



II° INCONTRO REGIONALE



tmd team
uro onco multidisciplinare
uro oncologico

13:00 Tavola Rotonda
Innovazione e appropriatezza: come
valutarle e come introdurle
Moderatori: **V. Baldazzi, G. Barbanti, P. Landi**



Prof. Andrea Minervini

Department of Oncologic Minimally-Invasive Urology and Andrology,
Careggi Hospital, University of Florence, Italy





Chirurgia mini invasiva

*Laparoscopy...**Robotic***

Una nuova filosofia

Chirurgia Open



1^a generazione



da Vinci Standard

1999

2^a generazione



da Vinci S-HD

2006

3^a generazione



da Vinci SI

2009

4^a generazione



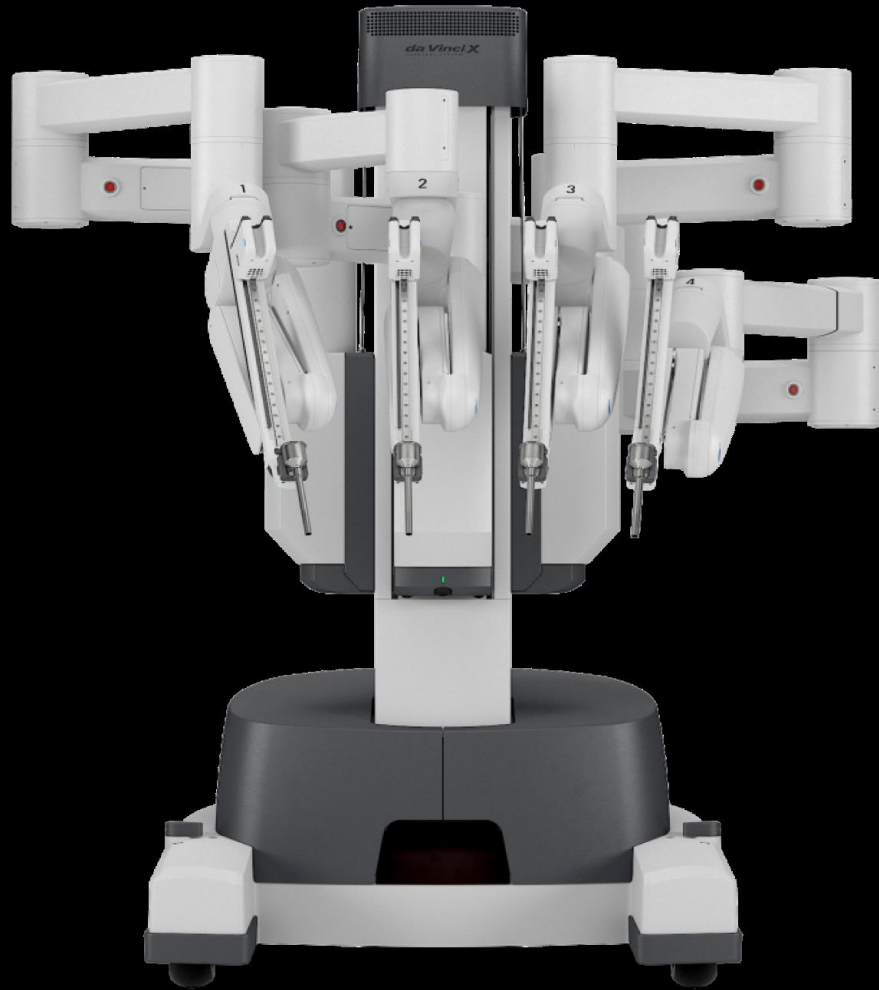
da Vinci XI

2014



da Vinci X

2017



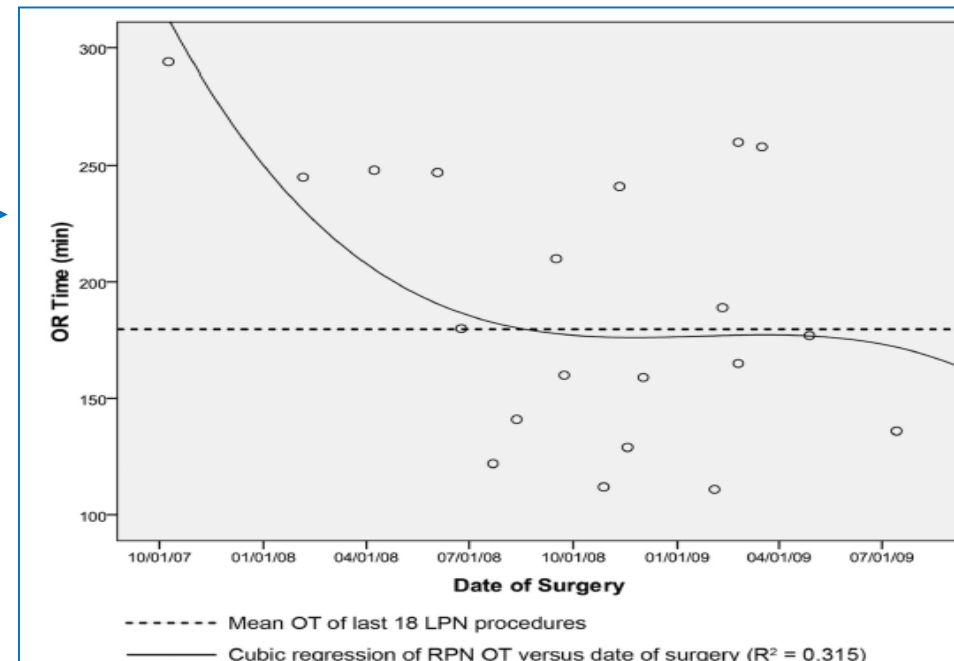
Potenziali vantaggi della laparoscopia robot-assistita vs. laparoscopia tradizionale:



1. *Visione tridimensionale in HD*
2. *Ampia scala di movimenti con gli strumenti endo-wrist*
3. *Bilanciamento dei movimenti della mano chirurgica*
4. *Curva di apprendimento ridotta*



Lavery et al, JSLS 2011



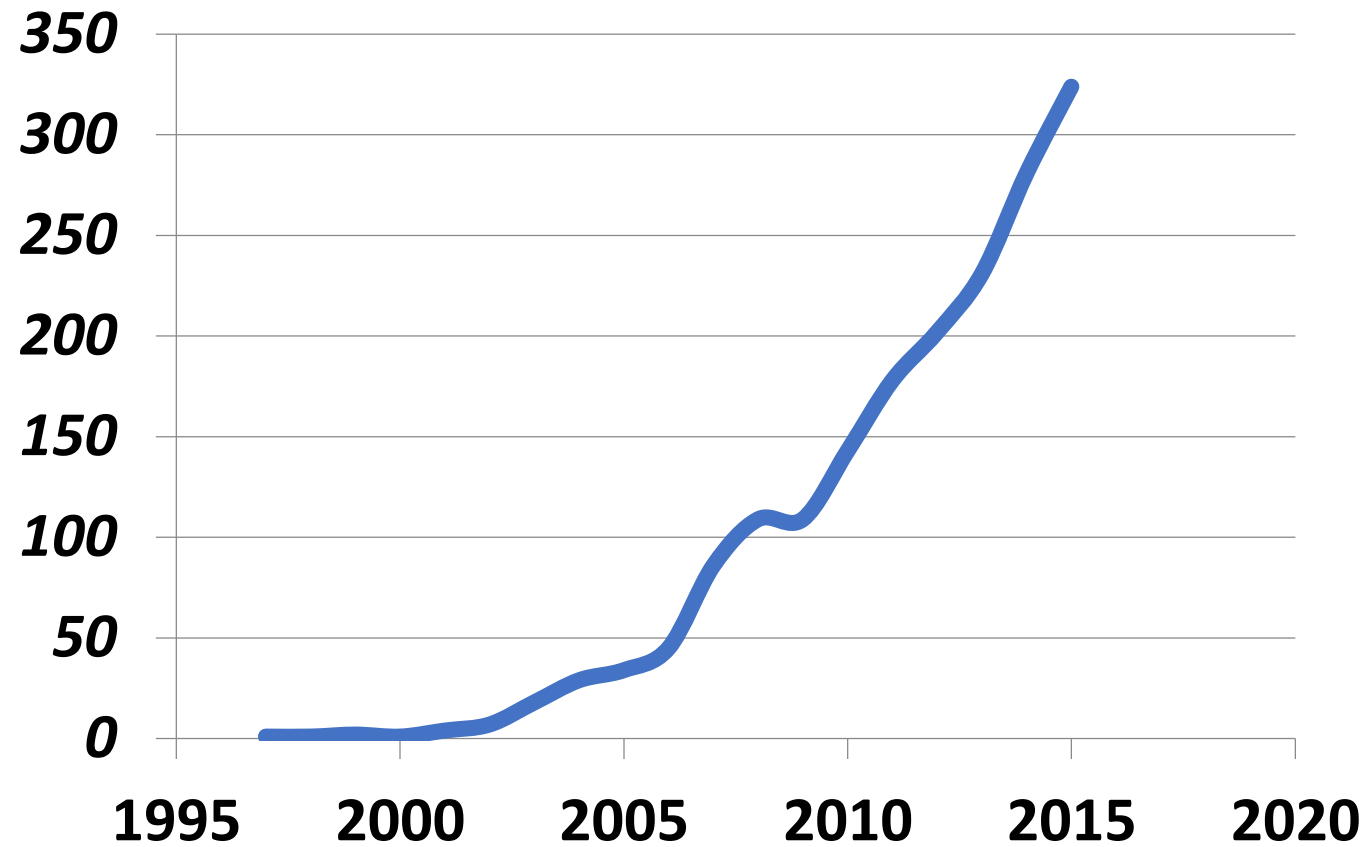
Trend Pubblicazione lavori indicizzati (Robot + Urology)

NCBI Resources How To

PubMed.gov
US National Library of Medicine
National Institutes of Health

PubMed robot urology Search

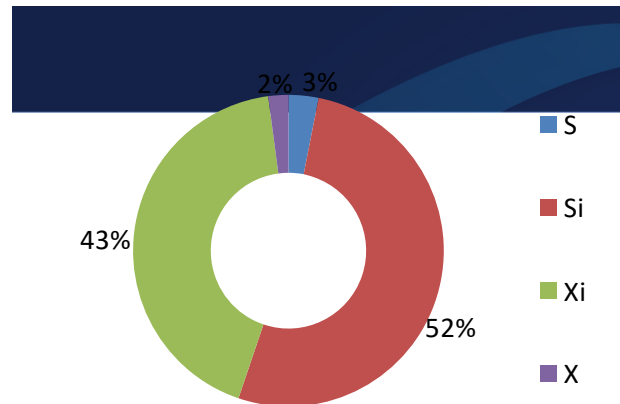
Create RSS Create alert Advanced



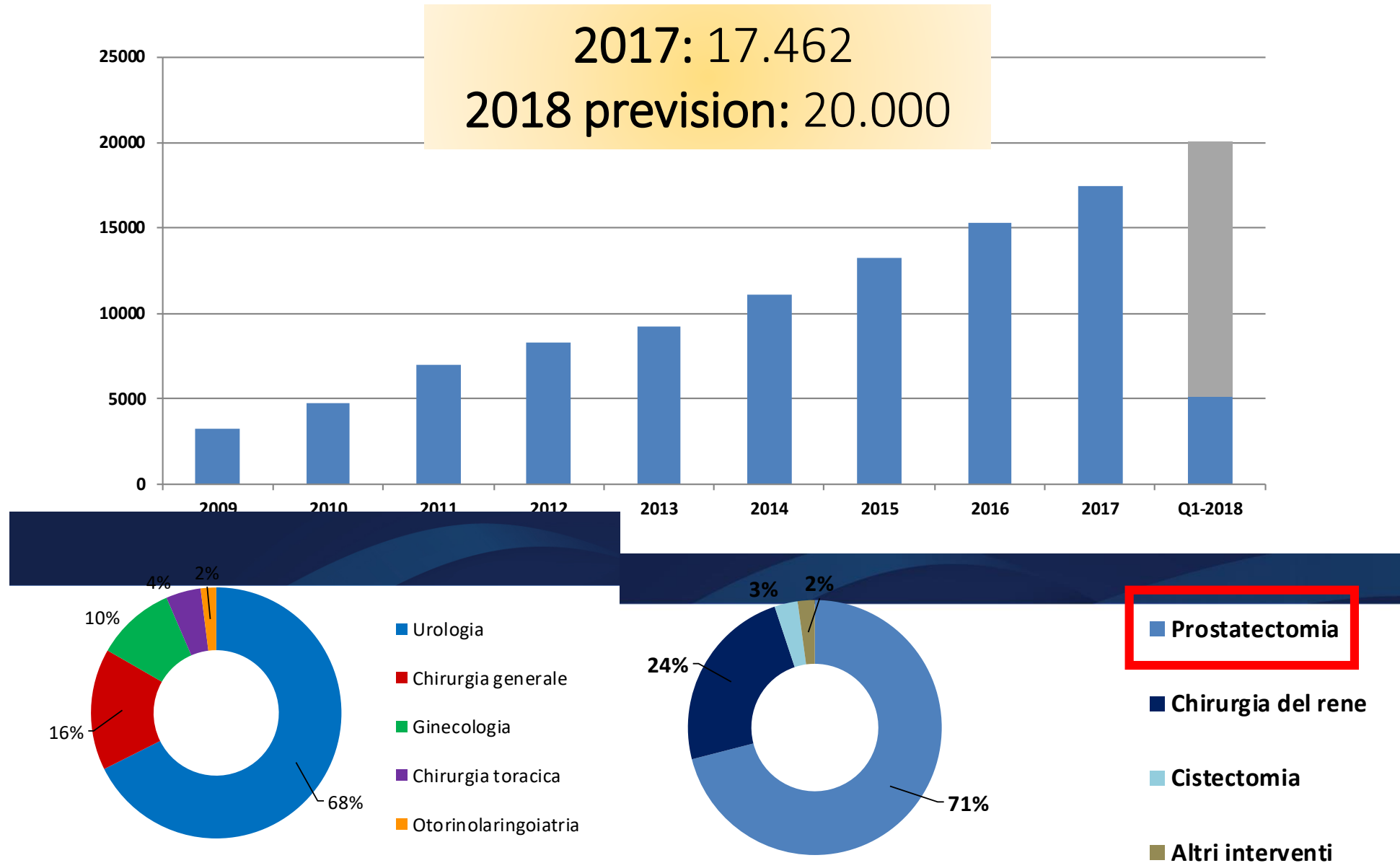
Diffusione del sistema Da Vinci: 4528 Da Vinci platforms (ad Aprile 2018)



Rest of World 237



Numero di procedure robotiche in Italia



La robotica in URO-oncologia

CA CANCER J CLIN 2018;68:7-30

Cancer Statistics, 2018

Rebecca L. Siegel, MPH^{1*}; Kimberly D. Miller, MPH²; Ahmedin Jemal, DVM, PhD ³

Estimated New Cases

Males			Females		
Prostate	164,690	19%	Breast	266,120	30%
Lung & bronchus	121,680	14%	Lung & bronchus	112,350	13%
Colon & rectum	75,610	9%	Colon & rectum	64,640	7%
Urinary bladder	62,380	7%	Uterine corpus	63,230	7%
Melanoma of the skin	55,150	6%	Thyroid	40,900	5%
Kidney & renal pelvis	42,680	5%	Melanoma of the skin	36,120	4%
Non-Hodgkin lymphoma	41,730	5%	Non-Hodgkin lymphoma	32,950	4%
Oral cavity & pharynx	37,160	4%	Pancreas	26,240	3%
Leukemia	35,030	4%	Leukemia	25,270	3%
Liver & intrahepatic bile duct	30,610	4%	Kidney & renal pelvis	22,660	3%
All Sites	856,370	100%	All Sites	878,980	100%

Estimated Deaths

Males			Females		
Lung & bronchus	83,550	26%	Lung & bronchus	70,500	25%
Prostate	29,430	9%	Breast	40,920	14%
Colon & rectum	27,390	8%	Colon & rectum	23,240	8%
Pancreas	23,020	7%	Pancreas	21,310	7%
Liver & intrahepatic bile duct	20,540	6%	Ovary	14,070	5%
Leukemia	14,270	4%	Uterine corpus	11,350	4%
Esophagus	12,850	4%	Leukemia	10,100	4%
Urinary bladder	12,520	4%	Liver & intrahepatic bile duct	9,660	3%
Non-Hodgkin lymphoma	11,510	4%	Non-Hodgkin lymphoma	8,400	3%
Kidney & renal pelvis	10,010	3%	Brain & other nervous system	7,340	3%
All Sites	323,630	100%	All Sites	286,010	100%

3 neoplasie di competenza urologica tra le 10 più frequenti
(*prostata, rene e vescica*)



FIGURE 1. Ten Leading Cancer Types for the Estimated New Cancer Cases and Deaths by Sex, United States, 2018. Estimates are rounded to the nearest 10 and cases exclude basal cell and squamous cell skin cancers and in situ carcinoma except urinary bladder. Ranking is based on modeled projections and may differ from the most recent observed data.

What is a «very high volume» urologic robotic Center?

 **TROVA IL MEGLIO PER LA TUA SALUTE**
Sai dove curarti? Cerca la struttura sanitaria ideale per te!



es. Esami, Visite, Ospedali, Patologie... es. Lombardia, Milano... **Cerca**

Dove e Come Mi Curo, con oltre 600.000 informazioni, è il più grande motore di ricerca della salute in Italia, gratuito e completo, con valutazioni istituzionali.

[Scopri come funziona](#)

TUMORE MALIGNO ALLA PROSTATA

Le migliori strutture in Italia per volume annuale di interventi (Fonte: Ministero della Salute - PNE 2017)

- IEO - Istituto Europeo di Oncologia**
Milano (MI) >
- Azienda Ospedaliero Universitaria Careggi**
Firenze (FI) >
- Policlinico Sant'Orsola - Malpighi**
Bologna (BO) >
- Ospedale San Luigi Gonzaga**
Orbassano (TO) >
- Ente Ecclesiastico Ospedale Generale Regionale Miulli**
Acquaviva delle Fonti (BA) >

TUMORE MALIGNO AL RENE

Le migliori strutture in Italia per volume annuale di interventi (Fonte: Ministero della Salute - PNE 2017)

- Azienda Ospedaliero Universitaria Careggi**
Firenze (FI) >
- Policlinico Sant'Orsola - Malpighi**
Bologna (BO) >
- Azienda Ospedaliero Universitaria Pisana - stabilimento di Cisanello**
Pisa (PI) >
- Istituto Nazionale Tumori Regina Elena**
Roma (RM) >
- IEO - Istituto Europeo di Oncologia**
Milano (MI) >

[Mostra tutte le migliori strutture](#)

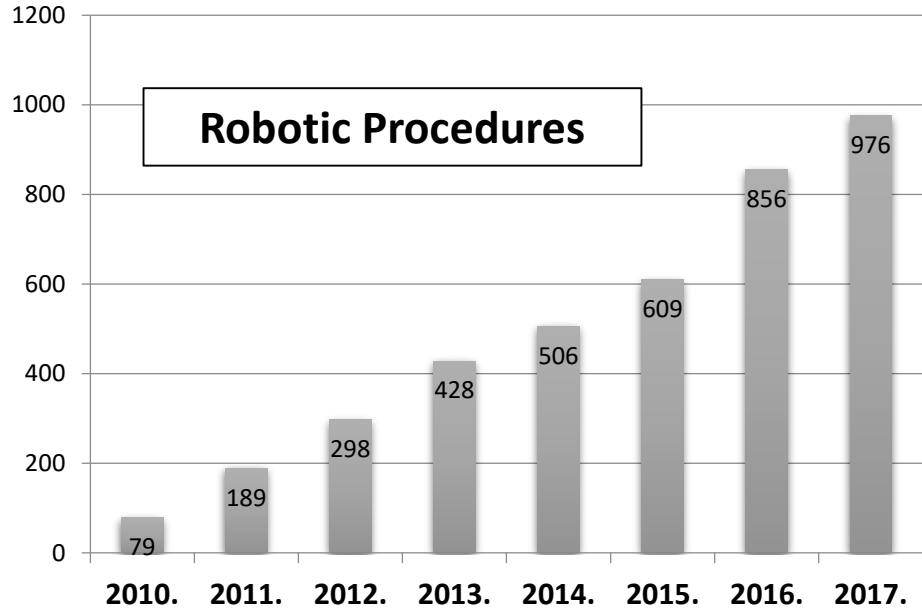
TUMORE MALIGNO ALLA VESCICA

Le migliori strutture in Italia per volume annuale di interventi (Fonte: Ministero della Salute - PNE 2017)

- Azienda Ospedaliero Universitaria Careggi**
Firenze (FI) >
- Istituto Nazionale Tumori Regina Elena**
Roma (RM) >
- Policlinico Sant'Orsola - Malpighi**
Bologna (BO) >
- Ospedale San Raffaele - Gruppo San Donato**
Milano (MI) >
- Azienda Ospedaliero Universitaria Pisana - stabilimento di Cisanello**
Pisa (PI) >

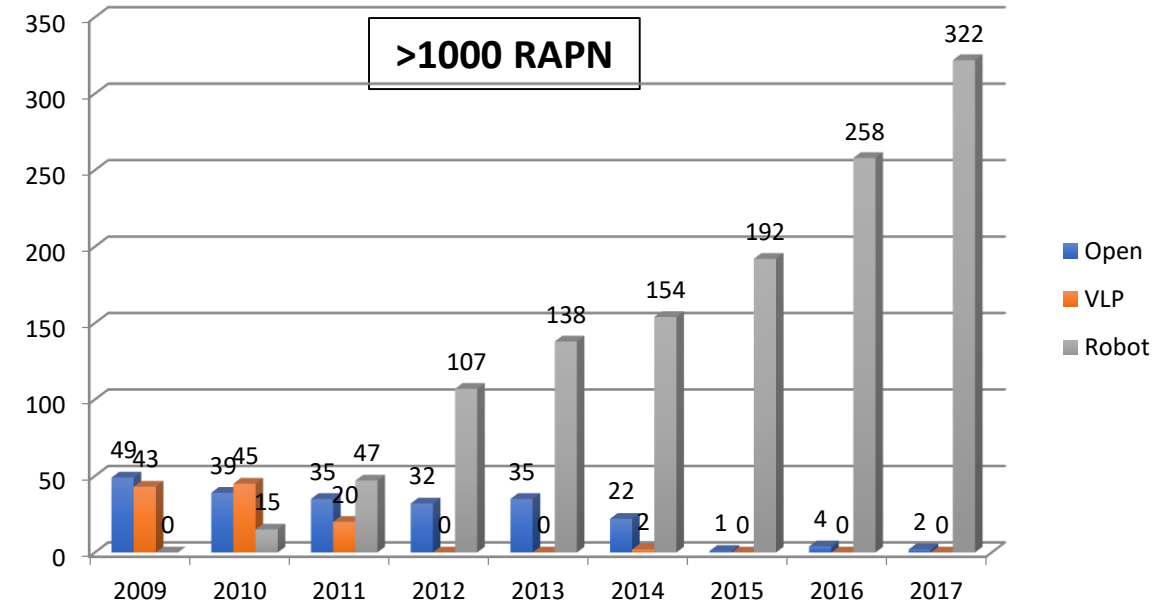
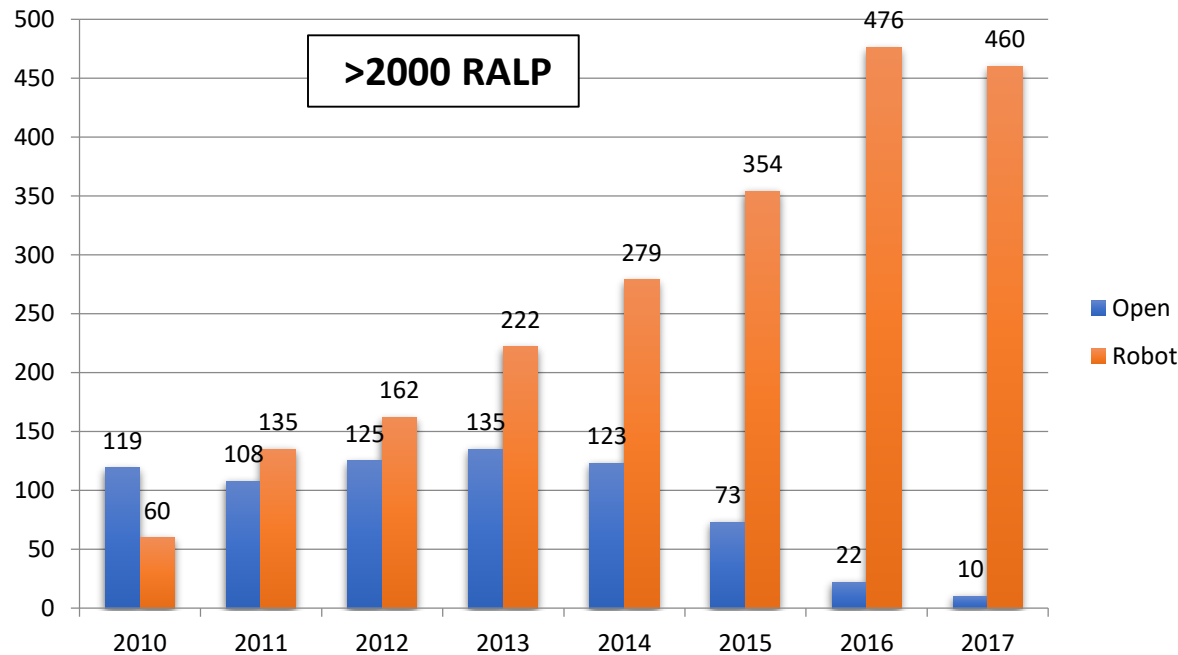
[Mostra tutte le migliori strutture](#)

Centro urologico alto volume



2010-2018:

>4000 Robotic Procedures

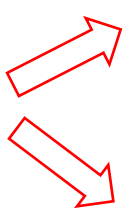


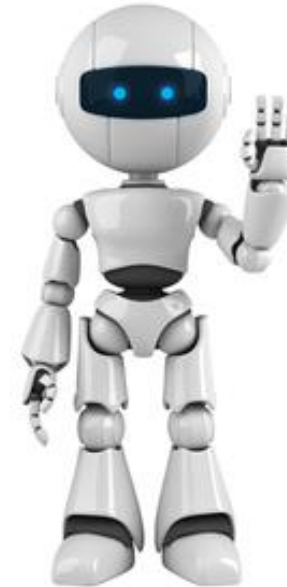


Guidelines

EAU Guidelines on Robotic and Single-site Surgery in Urology

Axel S. Merseburger^{a,*}, Thomas R.W. Herrmann^a, Shahrokh F. Shariat^b, Iason Kyriazis^c,
Udo Nagele^d, Olivier Traxer^e, Evangelos N. Liatsikos^c

- ***PROSTATECTOMIA RADICALE ROBOTICA***
- ***NEFRECTOMIA ROBOTICA***  **PARZIALE**
RADICALE
- ***CISTECTOMIA RADICALE ROBOTICA***





Guidelines

EAU Guidelines on Robotic and Single-site Surgery in Urology

Axel S. Merseburger^{a,*}, Thomas R.W. Herrmann^a, Shahrokh F. Shariat^b, Iason Kyriazis^c,
Udo Nagele^d, Olivier Traxer^e, Evangelos N. Liatsikos^c

- **PROSTATECTOMIA RADICALE ROBOTICA**
- **NEFRECTOMIA PARZIALE ROBOTICA**
- **NEFRECTOMIA RADICALE ROBOTICA**
- **CISTECTOMIA RADICALE ROBOTICA**



PENTAFECTA: approccio onnicomprensivo per la determinazione del risultato post prostatectomia

LOW RATE OF COMPLICATIONS

NEGATIVE SURGICAL MARGINS

NO BIOCHEMICAL RECURRENCE

ROBOT ASSISTED RADICAL PROSTATECTOMY



Patel et al., Eur urol 2011

CONTINENCE

POTENCY

Questionari validati

Questionario IIEF 5

L'International Index of Erectile Function - 5 (IIEF-5) è stato creato allo scopo di fornire un questionario sensibile e specifico per valutare la funzione erettiva. Nel rispondere si deve tener conto della attività sessuale relativa agli ultimi sei mesi

A) Negli ultimi sei mesi come è stata la sua capacità di raggiungere e mantenere l'erezione?

- 0- praticamente inesistente
- 1- molto bassa
- 2- bassa
- 3- moderata
- 4- alta
- 5- molto alta

B) Negli ultimi sei mesi dopo la stimolazione sessuale quanto spesso hai raggiunto un'erezione sufficiente alla penetrazione?

- 0- non ho avuto alcuna attività sessuale
- 1- quasi mai o mai
- 2- poche volte (molto meno della metà delle volte)
- 3- qualche volta (circa la metà delle volte)
- 4- la maggior parte delle volte (più della metà delle volte)
- 5- quasi sempre o sempre

C) Negli ultimi sei mesi durante il rapporto sessuale quanto spesso è riuscito a mantenere l'erezione dopo la penetrazione?

- 0- non ho tentato di avere rapporti sessuali
- 1- quasi mai o mai
- 2- poche volte (molto meno della metà delle volte)
- 3- qualche volta (circa la metà delle volte)
- 4- la maggior parte delle volte (più della metà delle volte)
- 5- quasi sempre o sempre

D) Negli ultimi sei mesi durante il rapporto sessuale quanto è stato difficile mantenere l'erezione fino alla fine del rapporto?

- 0- non ho tentato di avere rapporti sessuali
- 1- estremamente difficile
- 2- molto difficile
- 3- difficile
- 4- abbastanza difficile
- 5- facile

E) Negli ultimi sei mesi quando ha avuto un rapporto sessuale quanto spesso ha provato piacere?

- 0- non ho tentato di avere rapporti sessuali
- 1- quasi mai o mai
- 2- poche volte (molto meno della metà delle volte)
- 3- qualche volta (circa la metà delle volte)
- 4- la maggior parte delle volte (più della metà delle volte)
- 5- quasi sempre o sempre

Sommando i punteggi ottenuti (indicati a fianco della risposta scelta), si ottiene il risultato finale.

Da 22 a 25 l'attività sessuale è da considerarsi normale.

Da 17 a 21 siamo in presenza di disfunzione erettiva lieve.

Da 12 a 16 si manifesta una disfunzione erettile lieve-moderata.

Da 8 a 11 si tratta di una disfunzione erettile moderata.

Da 5 a 7 siamo in presenza di una grave disfunzione erettile.

ICIQ-SF

Questionario di autovalutazione
per la incontinenza urinaria

(Valore normale : PUNTEGGIO < 11)

Cognome e nome:

Data di nascita:

Sesso: M

F

SOMMA PUNTEGGI (1+2+3) _____

	Mai	1/sett	2-3/sett	1 al di	+ volte/die	continuamente
1) Con quale frequenza le capita di perdere urina ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PUNTEGGIO	0	1	2	3	4	5
2) Secondo la sua personale opinione quanta urina perde comunemente ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
PUNTEGGIO	0-1	2-3	4-5	6-7	8-9	10
3) Nel complesso le perdite quanto influiscono negativamente nella sua vita ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PUNTEGGIO	1	3	5	7	9	10

In quali circostanze perde urina ?

- Prima di riuscire ad arrivare in bagno
- Quando tossisco o starnutisco
- Durante il sonno
- Durante la attività fisica
- Una volta rivestito/a dopo avere urinato
- Senza ragioni particolari
- Sempre

Prostatectomia radicale robot-assisted - RALP

EUROPEAN UROLOGY 64 (2013) 277–291

available at www.sciencedirect.com
journal homepage: www.europeanurology.com



Guidelines on Robotic- and Single-site Surgery in Urology

Guidelines

EAU Guidelines on Robotic and Single-site Surgery in Urology

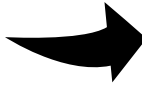
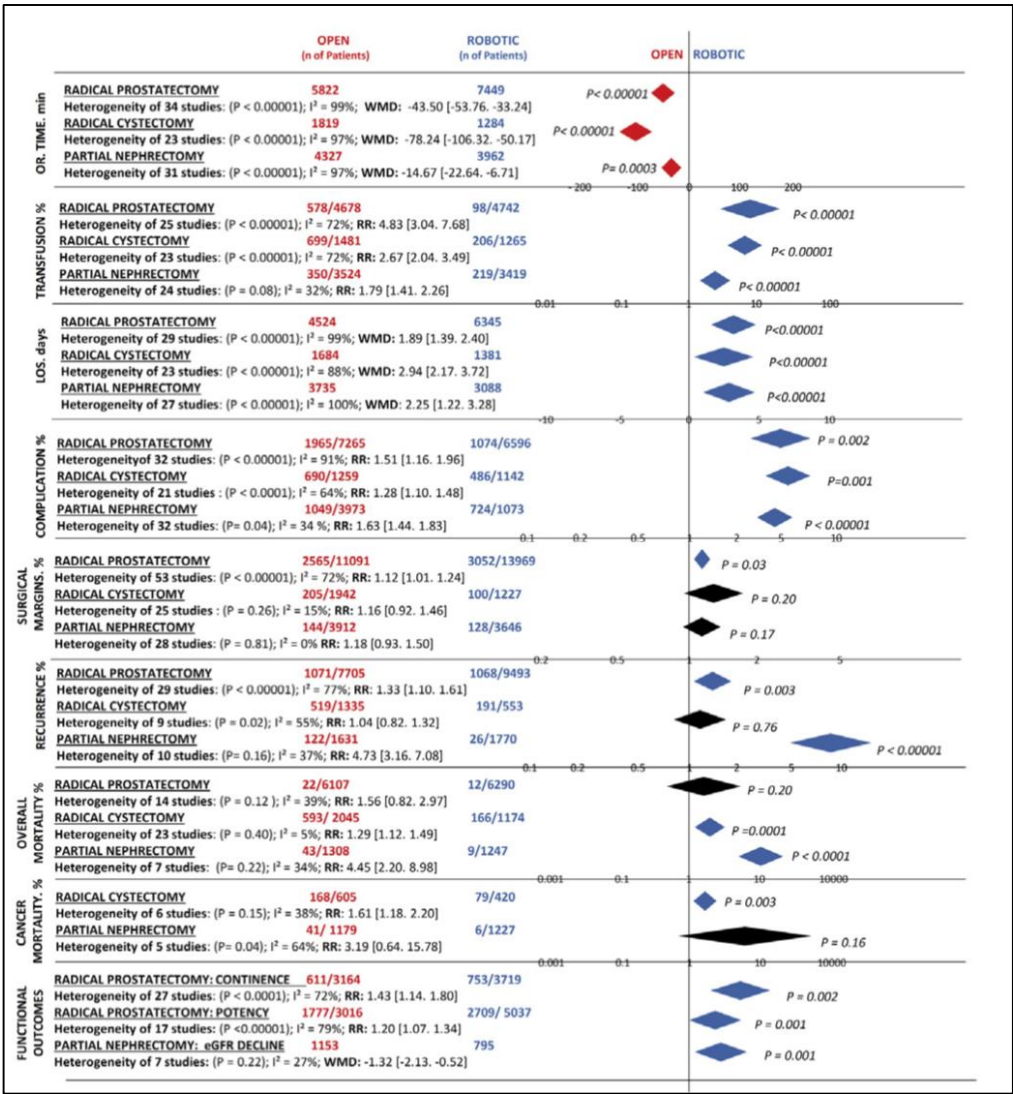
Axel S. Merseburger^{a,*}, Thomas R.W. Herrmann^a, Shahrokh F. Shariat^b, Iason Kyriazis^c,
Udo Nagele^d, Olivier Traxer^e, Evangelos N. Liatsikos^c



Recommendation	GR
Robotic surgery does not improve oncological outcomes in comparison to ORP and LRP; surgical expertise is the crucial factor. Use of the robot is not recommended to improve surgical outcomes.	A
Recommendations	GR
To achieve better early continence results, the use of robotic technique is recommended.*	C
Recommendations	GR
To achieve better early potency results, the use of laparoscopy or robotic techniques are recommended.*	C
To achieve better early potency results, a cautery-free (i.e. athermal) technique during neurovascular bundle dissection is recommended.	A

Neoplasie urologiche e chirurgia robotica – *SINTESI DELLE EVIDENZE (2018)*

Robotic surgery for urologic malignancies



L'approccio chirurgico al tumore di prostata, rene e vescica è sempre più robot-assisted



Prostatectomia radicale: La letteratura scientifica indica che l'approccio robotico garantisce Trasfusione rate, LOS, Complications rate, surgical margin rate, recurrence rate and functional outcomes *superiori* a quelli della open

Gill I, Cacciamani G. The changing face of urologic oncologic surgery from 2000-2018 (63 141 patients) - impact of robotics. J Urol 2018 (199); 4: e577–e578

Continenza: precocità

2,438 pazienti
933 RALP e 1,505 open RRP
(82.6% dal PCOS e 17.4% dal CEASAR)

The Comparative Harms of Open and Robotic Prostatectomy in Population Based Samples

Brock O'Neil,* Tatsuki Koyama, JoAnn Alvarez, Ralph M. Conwill, Peter C. Albertsen, Matthew R. Cooperberg, Michael Goodman, Sheldon Greenfield, Ann S. Hamilton, Karen E. Hoffman, Richard M. Hoffman, Sherrie H. Kaplan, Janet L. Stanford, Antoinette M. Stroup, Lisa E. Paddock, Xiao-Cheng Wu, Robert A. Stephenson, Matthew J. Resnick, Daniel A. Barocas and David F. Penson

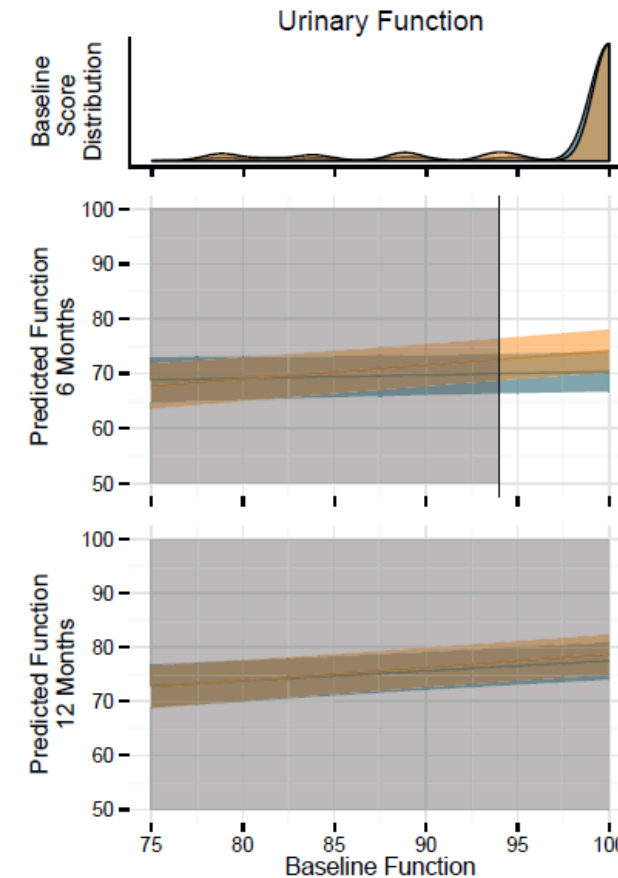
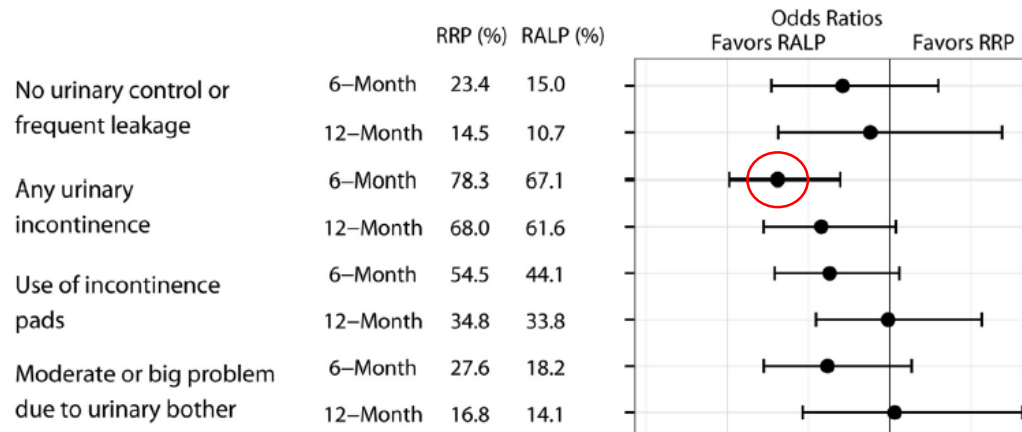
Table 3. Multivariable linear regression models for domain summary scores by time of survey

	Urinary Function Summary Scores				Sexual Function Summary Scores*			
	6 Mos		12 Mos		6 Mos		12 Mos	
	Coefficient	p Value	Coefficient	p Value	Coefficient	p Value	Coefficient	p Value
Surgery: RALP vs RRP	3.77	0.005	1.20	0.35	8.31	<0.001	7.64	<0.001
Baseline function (10 pts)†	0.61	0.21	1.87	<0.001	1.20	<0.001	1.54	<0.001
Interactions								
Surgery-baseline function (10 pts)	1.96	0.003	0.55	0.39	1.43	<0.001	2.01	<0.001
Age-10 yrs, continuous	-2.78	0.001	-2.63	0.001	-1.43	0.06	-3.22	<0.001
Race: white vs other	0.75	0.56	-0.06	0.96	-0.33	0.76	-0.65	0.58
Income vs less than \$30,000:								
\$30,000-\$100,000	-0.80	0.59	-0.26	0.86	-1.13	0.39	-0.12	0.93
Greater than \$100,000	3.17	0.09	3.12	0.08	1.75	0.28	1.34	0.45
General health vs excellent:								
Poor	-23.59	<0.001	-24.22	<0.001	-12.15	0.002	-15.94	<0.001
Fair	-6.04	0.008	-6.95	0.002	-5.83	0.003	-10.83	<0.001
Good	-9.38	<0.001	-9.91	<0.001	-4.57	<0.001	-4.15	0.001
Very good	-2.67	0.03	-4.17	<0.001	-1.75	0.09	-3.16	0.004

Adjusted for education, marital and health insurance status, study site, days since treatment, PSA, Gleason score, margin and nerve sparing status, pathological stage, and use of androgen deprivation.

* Also adjusted for use of erectile dysfunction treatments.

† Refers to baseline summary scores for respective functional domains.



Potenza

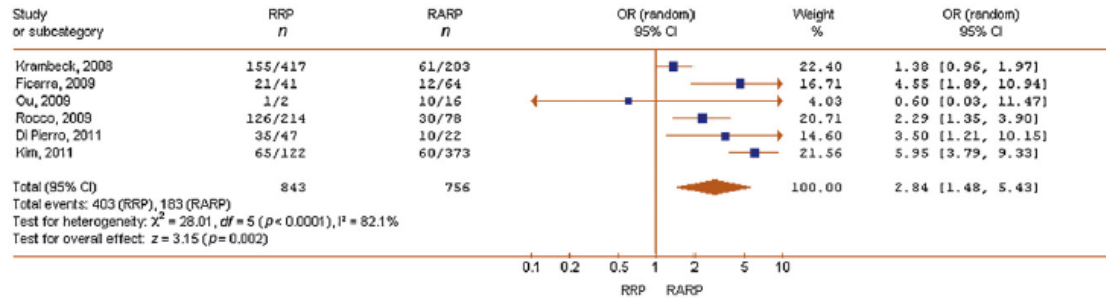
EUROPEAN UROLOGY 62 (2012) 418–430

Platinum Priority – Review – Prostate Cancer
 Editorial by Peter C. Albertsen on pp. 365–367 of this issue

Systematic Review and Meta-analysis of Studies Reporting Potency Rates After Robot-assisted Radical Prostatectomy

Vincenzo Ficarra^{a,b,*}, Giacomo Novara^a, Thomas E. Ahlering^c, Anthony Costello^d, James A. Eastham^e, Markus Graefen^f, Giorgio Guazzoni^g, Mani Menon^h, Alexandre Mottrie^b, Vipul R. Patelⁱ, Henk Van der Poel^j, Raymond C. Rosen^k, Ashutosh K. Tewari^l, Timothy G. Wilson^m, Filiberto Zattoni^a, Francesco Montorsi^g

Review: Radical prostatectomy; comparisons of different approaches
 Comparison: 11 Potency rate
 Outcome: 01 12-mo potency rate: RRP vs RARP

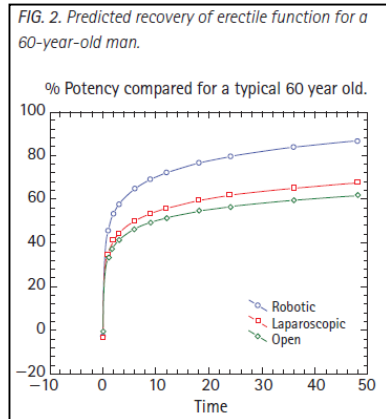


Miglior potenza con RALP a 12 mesi

© 2011 BJU INTERNATIONAL

Predicting erectile function outcome in men after radical prostatectomy for prostate cancer

Shaun Kilminster^a, Stig Müller^b, Mani Menon^c, Jean V. Joseph^d, David J. Ralph^e and Hiten R.H. Patel^f

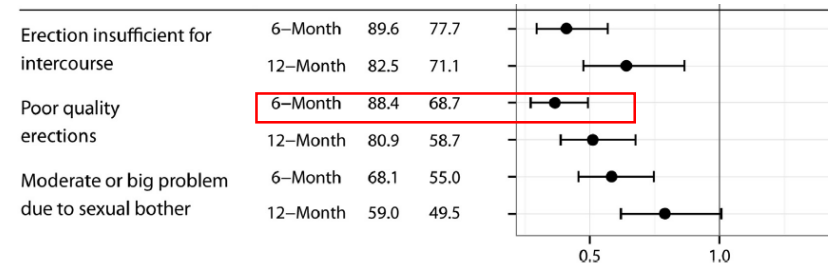


33 studi: oltre 12000 pazienti

Potenza Precoce con RALP

The Comparative Harms of Open and Robotic Prostatectomy in Population Based Samples

Brock O'Neil,^{*} Tatsuki Koyama, JoAnn Alvarez, Ralph M. Conwill, Peter C. Albertsen, Matthew R. Cooperberg, Michael Goodman, Sheldon Greenfield, Ann S. Hamilton, Karen E. Hoffman, Richard M. Hoffman, Sherrie H. Kaplan, Janet L. Stanford, Antoinette M. Stroup, Lisa E. Paddock, Xiao-Cheng Wu, Robert A. Stephenson, Matthew J. Resnick, Daniel A. Barocas and David F. Penson

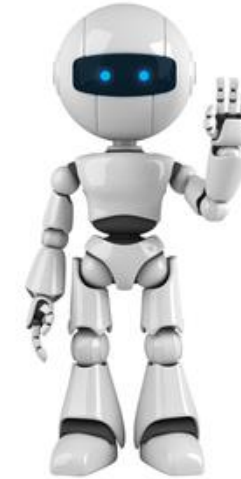




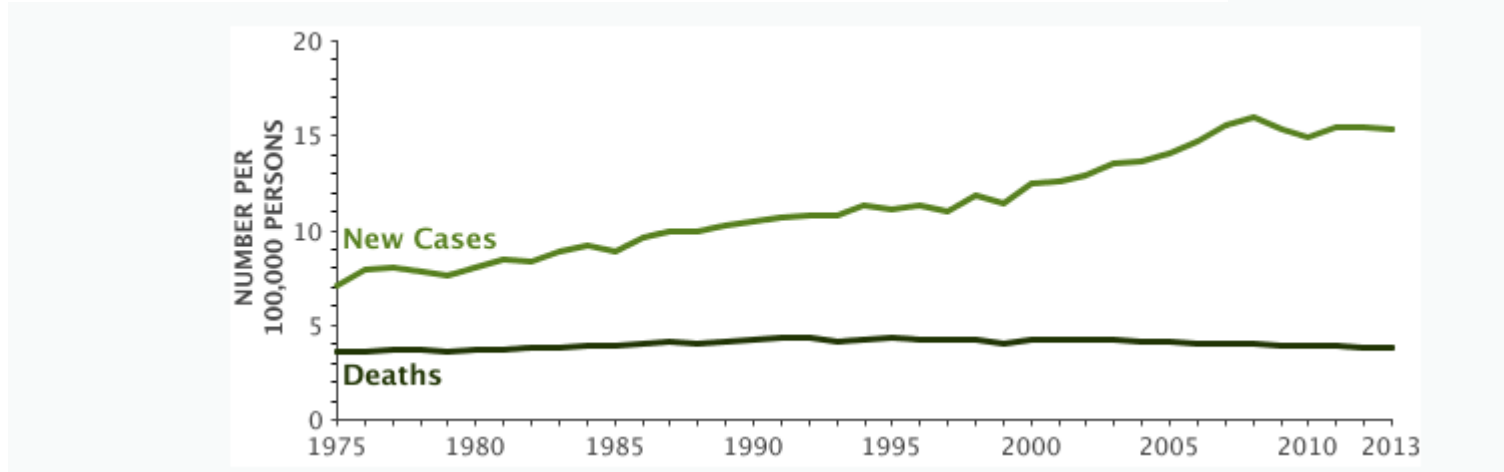
Guidelines

EAU Guidelines on Robotic and Single-site Surgery in Urology

Axel S. Merseburger^{a,*}, Thomas R.W. Herrmann^a, Shahrokh F. Shariat^b, Iason Kyriazis^c,
Udo Nagele^d, Olivier Traxer^e, Evangelos N. Liatsikos^c



- **PROSTATECTOMIA RADICALE ROBOTICA**
- **NEFRECTOMIA PARZIALE ROBOTICA**
- **NEFRECTOMIA RADICALE ROBOTICA**
- **CISTECTOMIA RADICALE ROBOTICA**



Renal Cell Cancer Stage Migration

Analysis of the National Cancer Data Base

© 2008 American Cancer Society

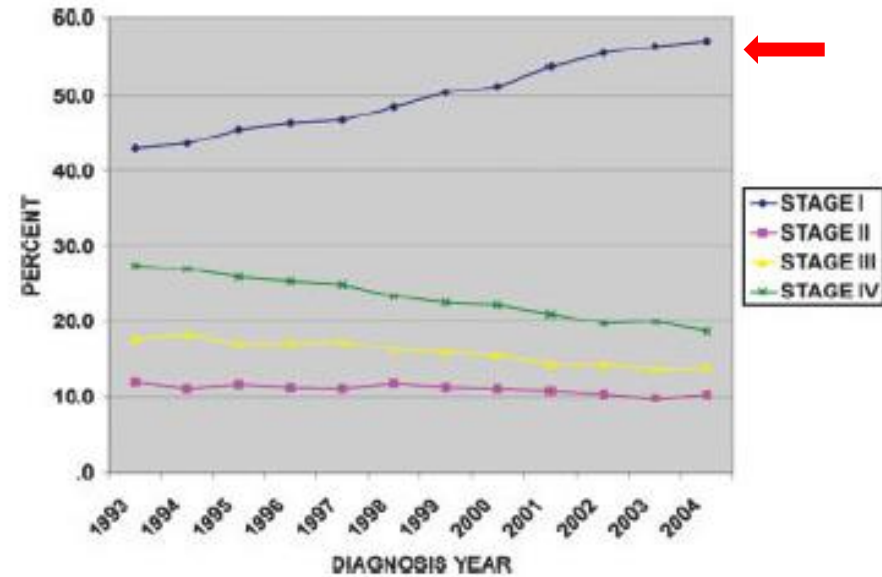


FIGURE 1. Renal cell carcinoma (RCC) stage distribution by diagnosis year.

State of the art: definizione di Trifecta in NSS



- **Margini chirurgici negativi**
- **Tempo ischemia ridotto/procedura clampless + massima preservazione parenchima sano (sia in fase demolitiva che ricostruttiva)**
- **No complicanze**

EAU Guidelines on Renal Cell Carcinoma



European
Association
of Urology

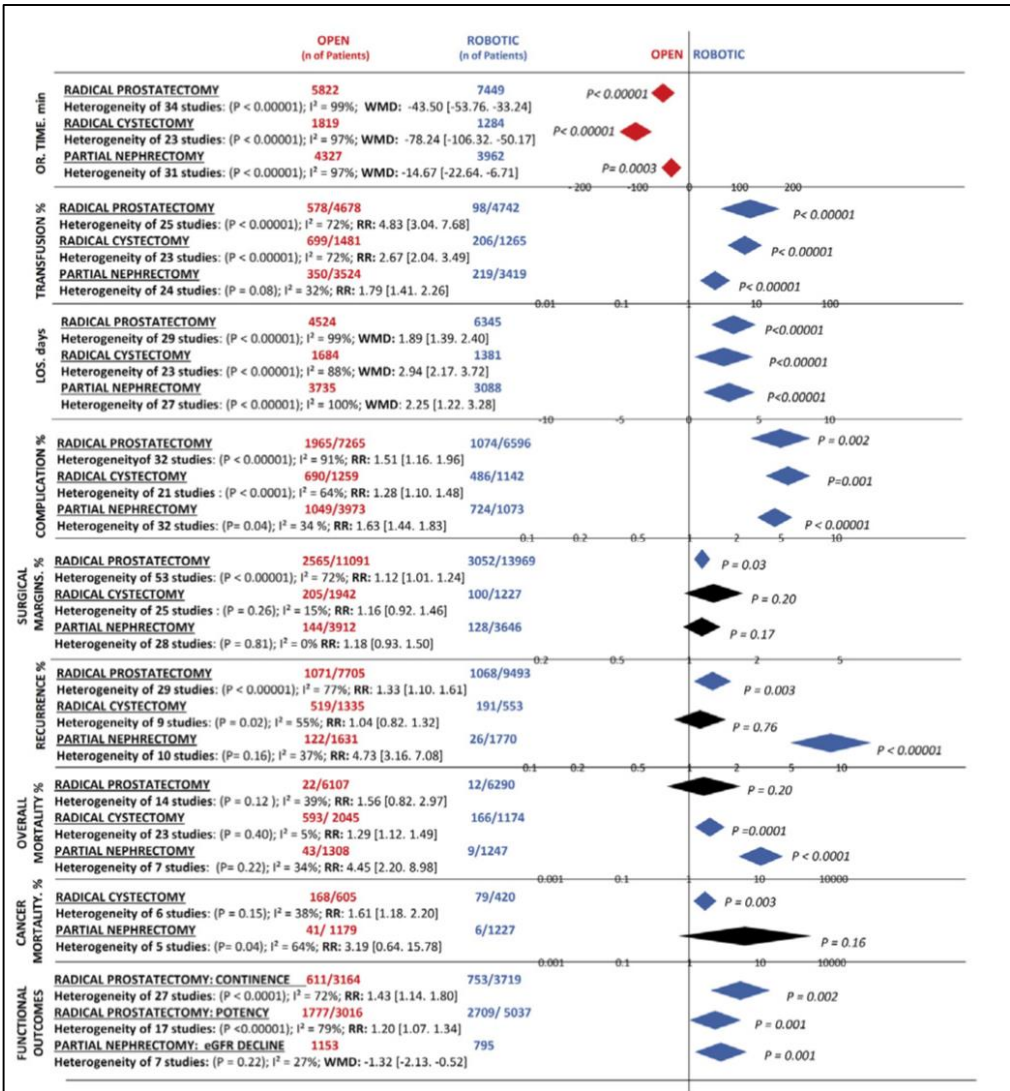
B. Ljungberg (Chair), L. Albiges, K. Bensalah,
A. Bex (Vice-chair), R.H. Giles (Patient Advocate), M. Hora,
M.A. Kuczyk, T. Lam, L. Marconi, A.S. Merseburger, T. Powles,
M. Staehler, A. Volpe
Guidelines Associates: S. Dabestani,
S. Fernández-Pello Montes, F. Hofmann, R. Tahbaz

© European Association of Urology 2017

- Attualmente la **Nephron Sparing Surgery** costituisce il **gold standard per RCC <T2** ogniqualvolta sia tecnicamente eseguibile
- **PN può essere eseguita con approccio open, VLP o robotico** in base all'esperienza dell'operatore

Neoplasie urologiche e chirurgia robotica – *SINTESI DELLE EVIDENZE (2018)*

Robotic surgery for urologic malignancies



L'approccio chirurgico al tumore di prostata, rene e vescica è sempre più robot-assisted



Nefrectomia parziale: La letteratura scientifica indica che l'approccio robotico garantisce Trasfusione rate, LOS, Complications rate, recurrence rate, overall mortality and functional outcomes *superiori* a quelli della open

Gill I, Cacciamani G. The changing face of urologic oncologic surgery from 2000-2018 (63 141 patients) - impact of robotics. J Urol 2018 (199); 4: e577–e578

Kidney Cancer

Five-year Oncologic Outcomes After Transperitoneal Robotic Partial Nephrectomy for Renal Cell Carcinoma

Hiury S. Andrade, Homayoun Zargar, Peter A. Caputo, Oktay Akca, Onder Kara, Daniel Ramirez, Georges-Pascal Haber, Robert J. Stein, Jihad H. Kaouk*

- 115 RPN da Giugno 2006 a Marzo 2010
- Follow-up medio 61.9 mo (IQR 50.9–71.4)

Variable	Value
Median tumor size, cm (IQR)	2.6 (2.0–3.7)
Clinical stage, n (%)	
T1a	91 (79)
T1b	20 (17.4)
T2a	4 (3.6)
Median RENAL score (IQR)	7 (6–9)
Low score (4–6), n (%)	37 (32)
Moderate score (7–9), n (%)	60 (52)
High score (10–12), n (%)	18 (16)
Median preoperative eGFR, ml/min/1.73 m ² (IQR)	85.9 (67.8–96.1)

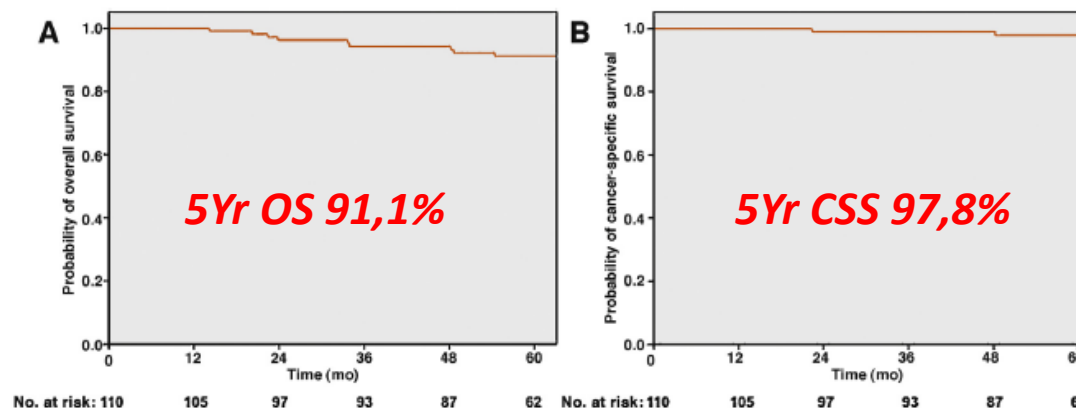
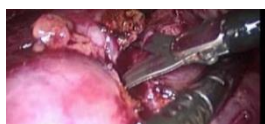


Table 4 – Long-term oncologic outcomes reported for partial nephrectomy series

Study	Year	Type	RCCs/patients, n (%)	Clinical tumor size (cm)	pT stage	PSM (%)	Follow-up (yr)	OS (%)	CSS (%)
Herr [3]	1999	OPN	70/70 (100)	3.0 ^a	All	–	10.0 ^b	93.0	97.0
Belldegrum et al [4]	1999	OPN	146/146 (100)	3.6 ^a	All	–	6.2 ^b	86.0	91.0
Fergany et al [5]	2000	OPN	107/107 (100)	4.7 ^a	All	–	5.0 ^a	77.0	88.0
Van Poppel et al [6]	2011	OPN	227/268 (84.7)	3.0 ^b	All	–	9.3 ^b	75.0	97.0
Lane and Gill [7]	2007	LPN	37/56 (66)	2.9 ^a	All	1 (2.7)	5.6 ^b	86.0	100.0
Lane et al [8]	2013	OPN	742/916 (81)	3.5 ^b	All	2 (0.3)	7.8 ^b	72.0	92.3
		LPN	461/625 (74)	2.6 ^b		5 (1.0)	6.6 ^b	78.0	96.9
Kyllo et al [18]	2012	RPN	124/124 (100)	3.0 ^b	T1	2 (1.6)	2.4 ^b	96.8	99.2
Khalifeh et al [17]	2013	RPN	102/134 (76.1)	3.0 ^a	All	1 (0.7)	3.0 ^a	97.0	99.0
Present study	2015	RPN	110/110 (100)	2.6 ^b	All	2 (1.7)	5.2 ^b	91.1	97.8



VLP PN VS. RAPN



EUROPEAN UROLOGY 67 (2015) 891-901

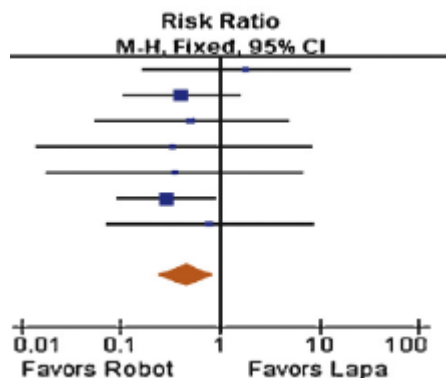
Comparison of Perioperative Outcomes Between Robotic and Laparoscopic Partial Nephrectomy: A Systematic Review and Meta-analysis

Ji Eun Choi^a, Ji Hye You^a, Dae Keun Kim^b, Koon Ho Rha^{b,*}, Seon Heui Lee^{c,*}



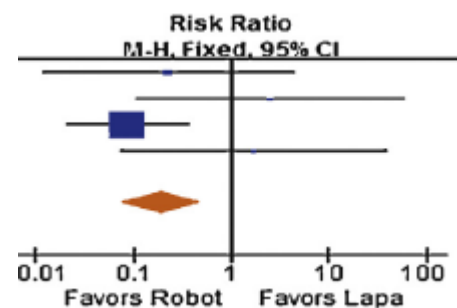
23 studies and 2240 patients were included

convert to open surgery



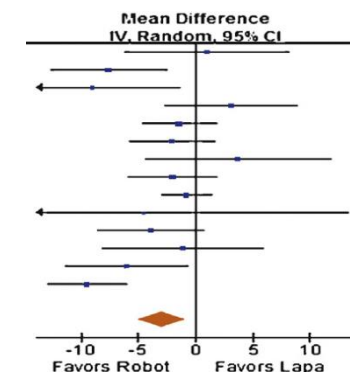
Total events 14 19
Heterogeneity: $\text{Chi}^2 = 2.27$, $\text{df} = 6$ ($p = 0.89$); $I^2 = 0\%$
Test for overall effect: $Z = 2.33$ ($p = 0.02$)

convert to radical surgery



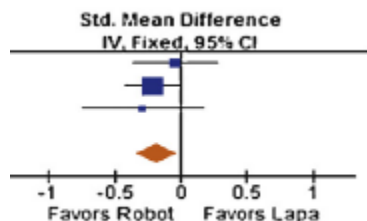
Total events 4 23
Heterogeneity: $\text{Chi}^2 = 5.60$, $\text{df} = 3$ ($p = 0.13$); $I^2 = 46\%$
Test for overall effect: $Z = 3.41$ ($p = 0.0006$)

warm ischemia time



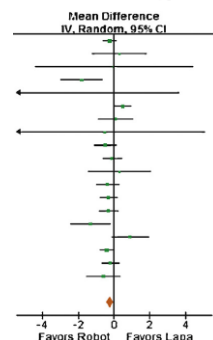
Heterogeneity: $\text{Tau}^2 = 8.42$; $\text{Chi}^2 = 34.15$, $\text{df} = 13$ ($p = 0.001$); $I^2 = 62\%$
Test for overall effect: $Z = 2.80$ ($p = 0.005$)

change of estimated GFR



Heterogeneity: $\text{Chi}^2 = 1.08$, $\text{df} = 2$ ($p = 0.58$); $I^2 = 0\%$
Test for overall effect: $Z = 2.24$ ($p = 0.03$)

shorter LOS (p=0.004)

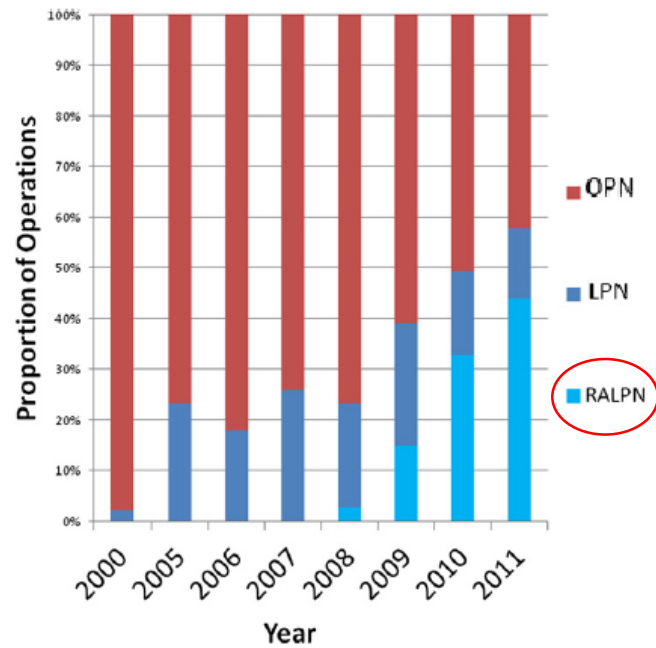


Heterogeneity: $\text{Tau}^2 = 0.09$; $\text{Chi}^2 = 32.45$, $\text{df} = 18$ ($p = 0.02$); $I^2 = 45\%$
Test for overall effect: $Z = 2.07$ ($p = 0.04$)

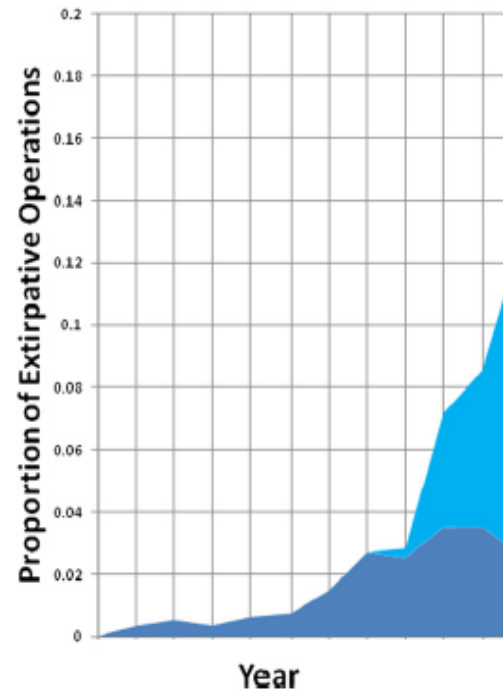
RPN è associata a risultati migliori rispetto alla LPN in:

- tasso di conversione a chirurgia open o radicale
- WIT
- GFR postoperatorio
- ospedalizzazione

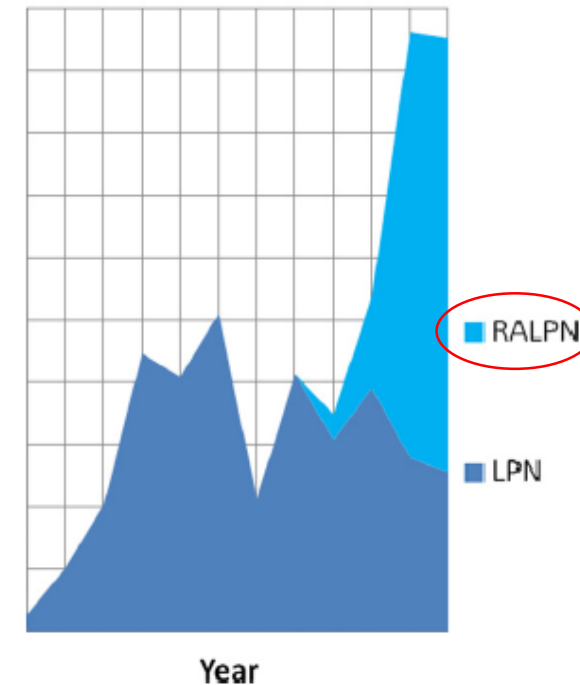
Trend internazionale di approccio a chirurgia conservativa per RCC



Non-University Hospitals



University Hospitals



Dal 2009 al 2011:

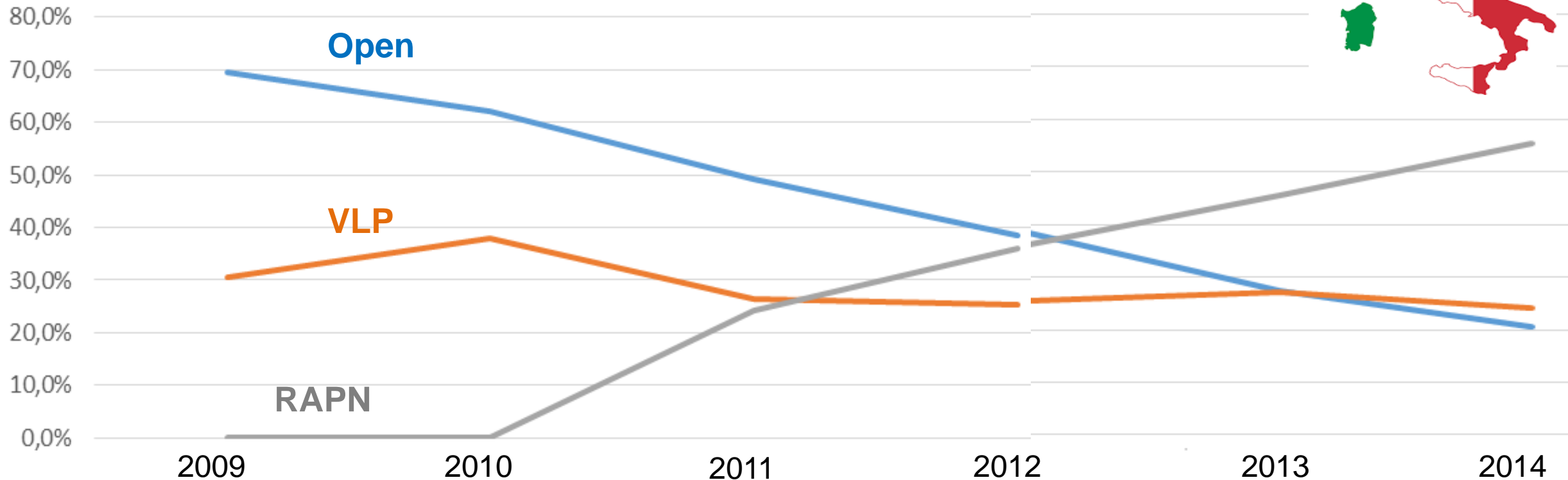
- Il ricorso a PN è incrementato
- Il numero di RAPN è incrementato arrivando a costituire almeno la metà di tutte le procedure di nefrectomia parziale negli ospedali universitari
- L'uso del robot spinge ad eseguire un maggior numero di nefrectomie parziali anche in casi ad alto score nefrometrico

A snapshot of nephron-sparing surgery in Italy: A prospective, multicenter report on clinical and perioperative outcomes (the RECORD 1 project)

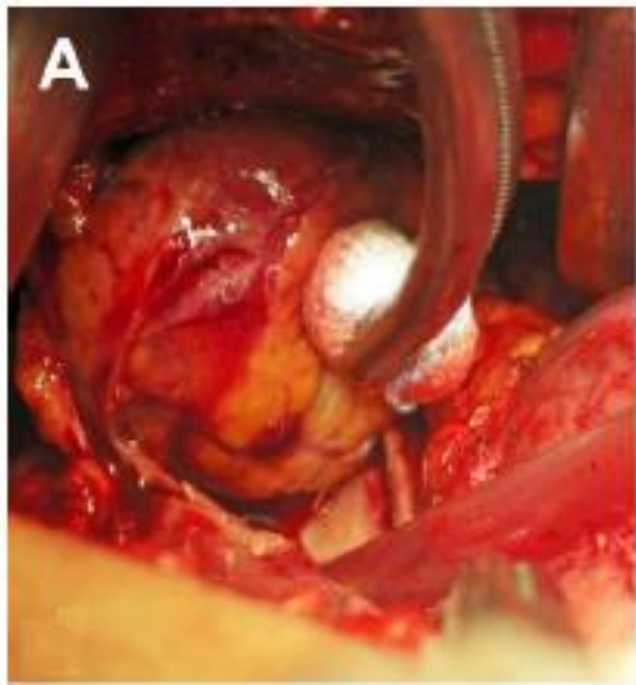
R. Schiavina ^{a,*}, A. Mari ^b, A. Antonelli ^c, R. Bertolo ^d, G. Bianchi ^e,
M. Borghesi ^{a,k}, E. Brunocilla ^a, C. Fiori ^d, N. Longo ^f,
G. Martorana ^a, V. Mirone ^f, G. Morgia ^g, G. Novara ^h, F. Porpiglia ^d,
B. Rovereto ⁱ, S. Serni ^b, C. Simeone ^c, M. Sodano ^c, C. Terrone ^j,
M. Carini ^b, A. Minervini ^b

Globally, 983 patients were evaluated at 19 centers

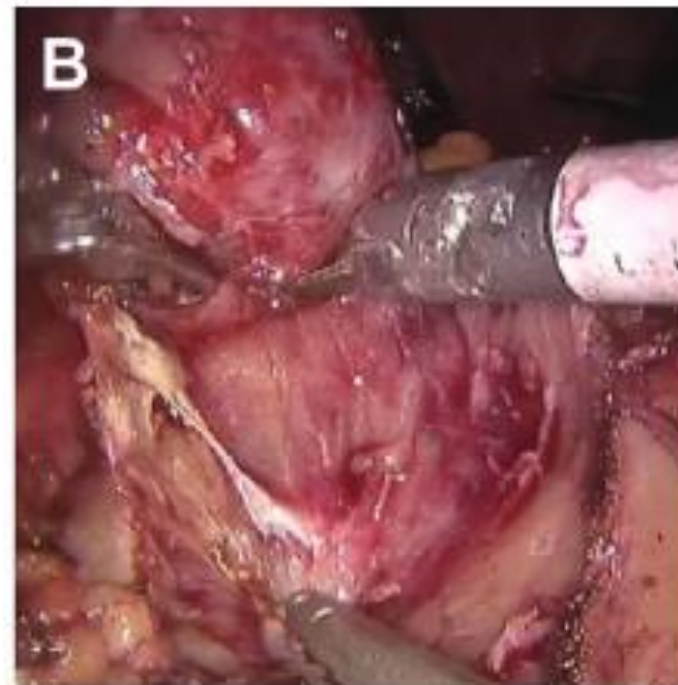
Overall rate of interventions per year analysing different approaches



ENUCLEAZIONE OPEN



ENUCLEAZIONE ROBOTICA



Robotic vs Open Simple Enucleation for the Treatment of T1a-T1b Renal Cell Carcinoma: A Single Center Matched-pair Comparison

Sergio Serni, Gianni Vittori, Lorenzo Masieri, Mauro Gacci, Alberto Lapini,
Giampaolo Siena, Graziano Vignolini, Andrea Mari, Marco Carini, and Andrea Minervini

Table 2. Perioperative results stratified according to surgical procedure

Intraoperative Outcomes	ERASE (n = 80)	OSE (n = 160)	P Value
Clamping of renal pedicle/artery, no. (%)	48 (60)	150 (93.8)	<.0001
WIT (min) mean ± SD (range)	18.5 ± 6 (9-38)	16.4 ± 5.3 (7-35)	.50
WIT >25 min, no. (%)	5/48 (10.4)	6/150 (4)	.10
WIT >30 min, no. (%)	2/48 (4.2)	2/150 (1.3)	.22
EBL (cc) mean ± SD	109 ± 112	181 ± 136	<.0001
Operative time (min) mean ± SD	157 ± 50	108 ± 36	<.0001
Total intraoperative complications, no. (%)	1 (1.25)	4 (2.5)	.54
Transfusions	1 (1.25)	2 (1.25)	
Spleen lesion	-	1 (0.62)	
Renal vein lesion	-	1 (0.62)	
Postoperative outcomes			
LOS (d, including the day of surgery) median (IQR)	5 (5-6)	6 (5-7)	.001
Postoperative overall complications, no. (%)	8 (10)	25 (15.6)	.17
Postoperative medical complications, no. (%)	1 (1.2)	3 (1.8)	.54
Postoperative surgical complications, no. (%)	7 (8.8)	22 (13.8)	.37
Postoperative transfusions (Clavien 2)	5 (6.3)	15 (9.4)	
Selective embolization (Clavien 3a)	2 (2.5)	3 (1.9)	
Reoperation for bleeding (Clavien 3b)	-	1 (0.6)	
Urinary fistula without stenting (Clavien 1)	-	3 (1.9)	
Urinary fistula with stenting (Clavien 3a)	-	-	
Clavien 4	-	-	
Clavien 5	-	-	
Transfusion rate (intra- and postoperative), no. (%)	8 (10.0)	21(13.1)	.48
Clavien 3 complications, no. (%)	2 (2.5)	4 (2.5)	.99
AKD (elective indication only), no. (%)	1/78 (1.3)	8/132 (6.1)	.10
Delta Hb (3rd postoperative day – baseline) (g/dL) mean ± SD	2.2 ± 1.2	2.4 ± 1.2	.31
Delta Cr (3rd postoperative day – baseline) (mg/dL) mean ± SD	0.11 ± 0.18	0.16 ± 0.82	.34
Delta eGFR (elective indication only), mean ± SD	8.5 ± 10.4	13.9 ± 12.7	.17
Pathologic assessment			
Benign tumors, no. (%)	12 (15)	20 (12.5)	.52
Pathological T stage, no. (%)			.21
pT1a	51/68 (75.0)	113/140 (80.7)	
pT1b	11/68 (16.2)	18/140 (12.9)	
pT3a	6/68 (8.8)	9/140 (6.4)	
Fuhrman nuclear grade (%)			
Grade 1	11/68 (16.2)	27/140 (19.3)	
Grade 2	42/68 (61.8)	84/140 (60.0)	
Grade 3-4	15/68 (22.0)	29/140 (20.7)	
PSM (%)	2/68 (2.9)	3/140 (2.1)	.63

ERASE è associata ad outcome analoghi a OSE in termini di:

- WIT
- Complicanze intra e postoperatorie
- Funzionalità renale
- Margini chirurgici positivi



Guidelines

EAU Guidelines on Robotic and Single-site Surgery in Urology

Axel S. Merseburger^{a,*}, Thomas R.W. Herrmann^a, Shahrokh F. Shariat^b, Iason Kyriazis^c,
Udo Nagele^d, Olivier Traxer^e, Evangelos N. Liatsikos^c

- **PROSTATECTOMIA RADICALE ROBOTICA**
- **NEFRECTOMIA PARZIALE ROBOTICA**
- **NEFRECTOMIA RADICALE ROBOTICA**
- **CISTECTOMIA RADICALE ROBOTICA**





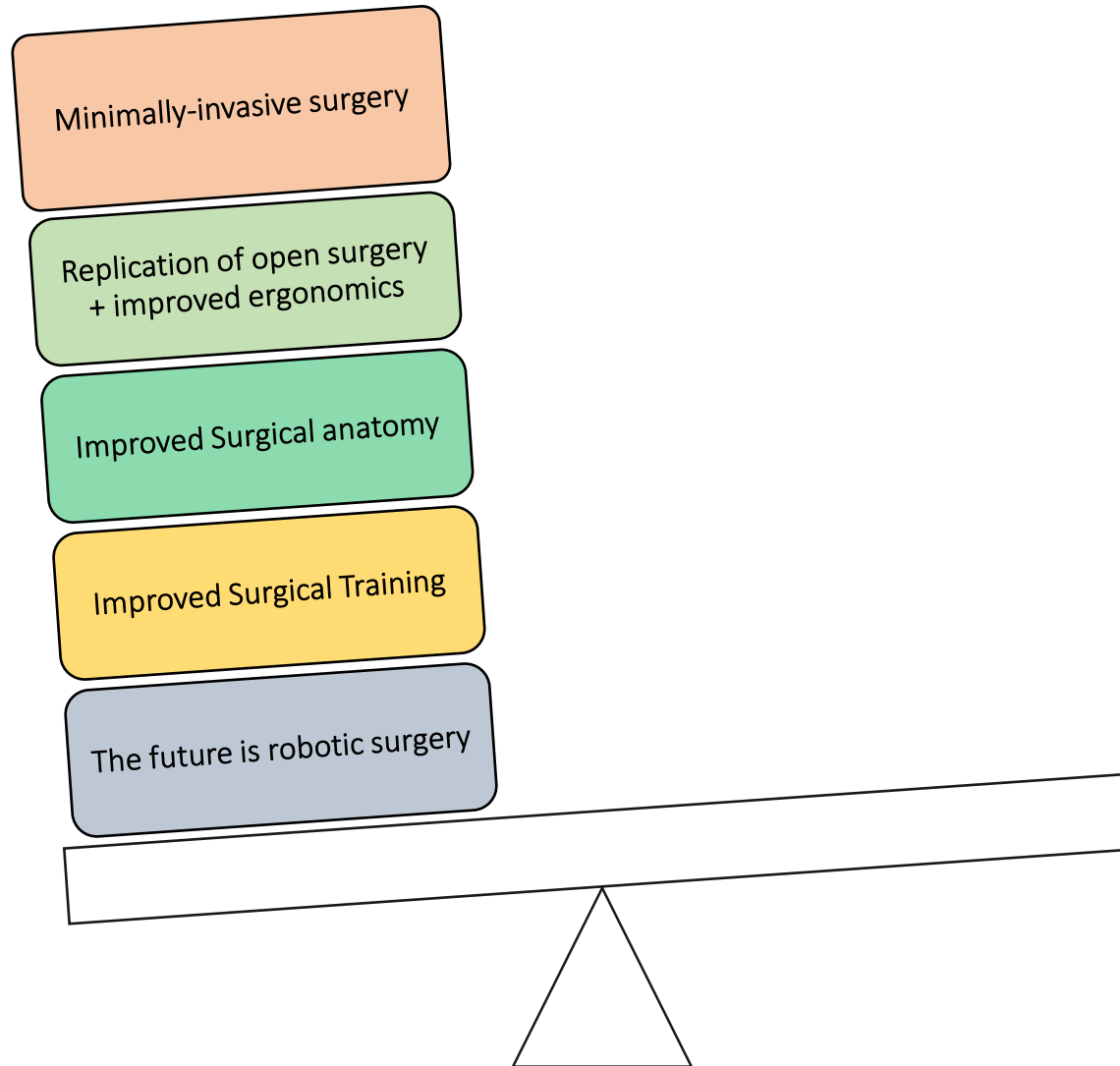
Florence robotic intracorporeal neobladder (FloRIN): a new reconfiguration strategy developed following the IDEAL guidelines

Andrea Minervini*^{ID}, Davide Vanacore*, Gianni Vittori*, Martina Milanese*, Agostino Tuccio*, Giampaolo Siena*, Riccardo Campi*, Andrea Mari*, Andrea Gavazzi[†] and Marco Carini*

To describe Surgical technique and the preliminar results on the first 18 patients according to the IDEAL Guidelines



Open vs Robotic Radical Cystectomy: *PRO ROBOTICS*



Why robotic surgery for radical cystectomy?

Open vs robotic radical cystectomy: *Surgeon and Center factors*

Seminar
Lancet 2016; 388: 2796-810

Bladder cancer

Ashish M Kamat, Noah M Hahn, Jason A Efsthathiou, Seth P Lerner, Per-Uno Malmström, Woonyoung Choi, Charles C Guo, Yair Lotan, Wassim Kassouf

Of the completed trials comparing open to robotic radical cystectomy, some suggest no benefit from the robotic approach; larger studies are ongoing. Additionally, the long-term oncological efficacy of robotic-assisted radical cystectomy compared with open radical cystectomy has not been determined.

EAU Guidelines on Muscle-invasive and Metastatic Bladder Cancer

J.A. Witjes (Chair), M. Bruins, E. Compérat, N.C. Cowan,
G. Gakis, V. Hernández, T. Lebrét, A. Lorch,
M.J. Ribal (Vice-chair), A.G. van der Heijden, E. Veskimäe
Guidelines Associates: E. Linares Espinós,
M. Rouanne, Y. Neuzillet

EAU 2018

European Association of Urology

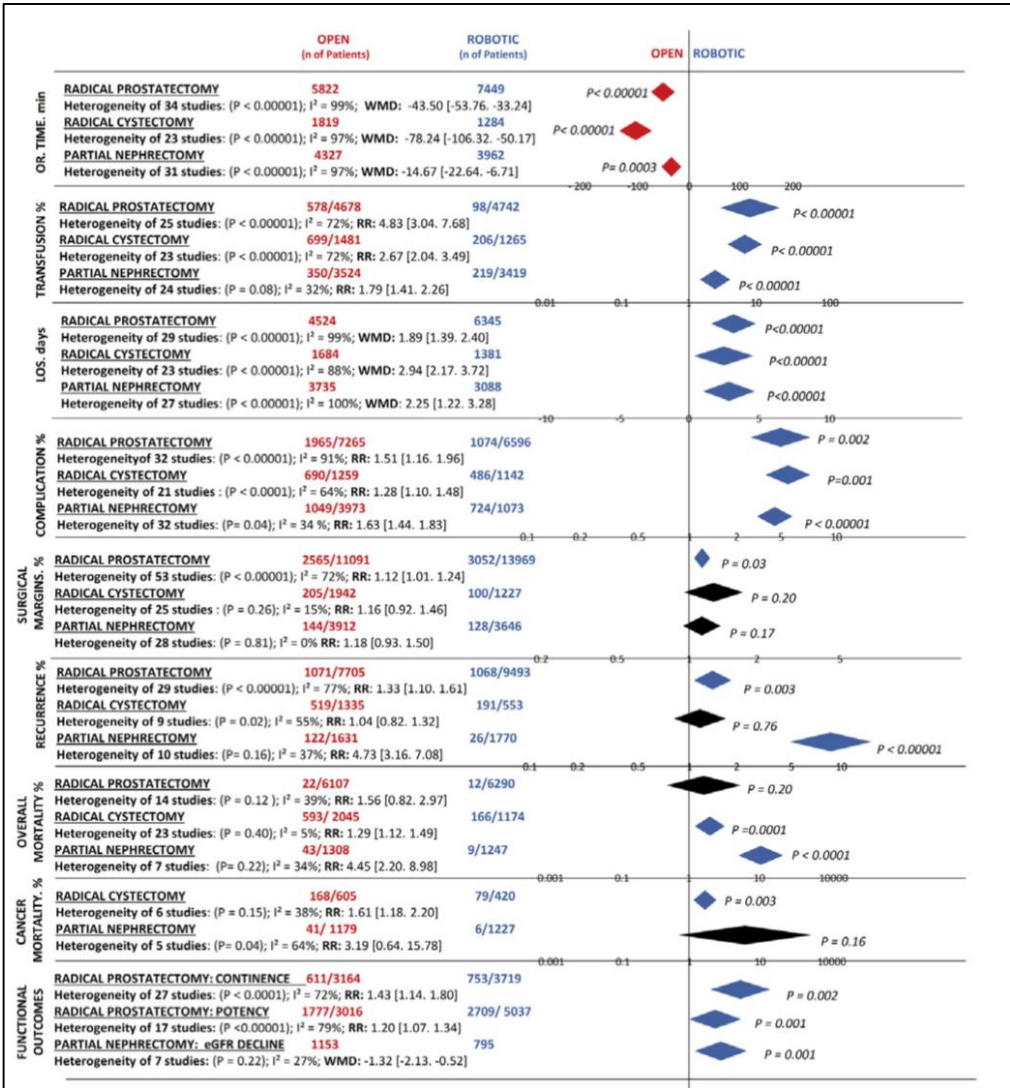
© European Association of Urology 2018

Summary of evidence	LE
Robot-assisted radical cystectomy (RARC) provides longer operative time (1-1.5 hours), major costs, but shorter length of hospital stay (1-1.5 days) and less blood loss compared to open radical cystectomy (ORC).	1
RARC series suffer from a significant stage selection bias as compared to ORC.	1
Grade 3, 90-day complication rate is lower with RARC.	2
Most endpoints, if reported, including intermediate-term oncological endpoint and quality of life are not different between RARC and ORC.	2
Surgeons experience and institutional volume are considered the key factor for outcome of both RARC and ORC, not the technique.	2
Recommendations on how to define challenging patients and an experienced RARC surgeon are still under discussion.	3
The use of neobladder after RARC still seems under-utilised, and functional results of intracorporeally constructed neobladders should be studied.	4

Recommendations	Strength rating
Inform the patient of the advantages and disadvantages of open radical cystectomy (ORC) and robot-assisted radical cystectomy (RARC) to allow selection of the proper procedure.	Strong
Select experienced centres, not specific techniques, both for RARC and ORC.	Strong

Neoplasie urologiche e chirurgia robotica – *SINTESI DELLE EVIDENZE (2018)*

Robotic surgery for urologic malignancies



L'approccio chirurgico al tumore di prostata, rene e vescica è sempre più robot-assisted



Cistectomia radicale: La letteratura scientifica indica che l'approccio robotico garantisce Trasfusione rate, LOS, Complications rate *superiori* a quelli della open

Gill I, Cacciamani G. The changing face of urologic oncologic surgery from 2000-2018 (63 141 patients) - impact of robotics. J Urol 2018 (199); 4: e577–e578

SICUREZZA ONCOLOGICA

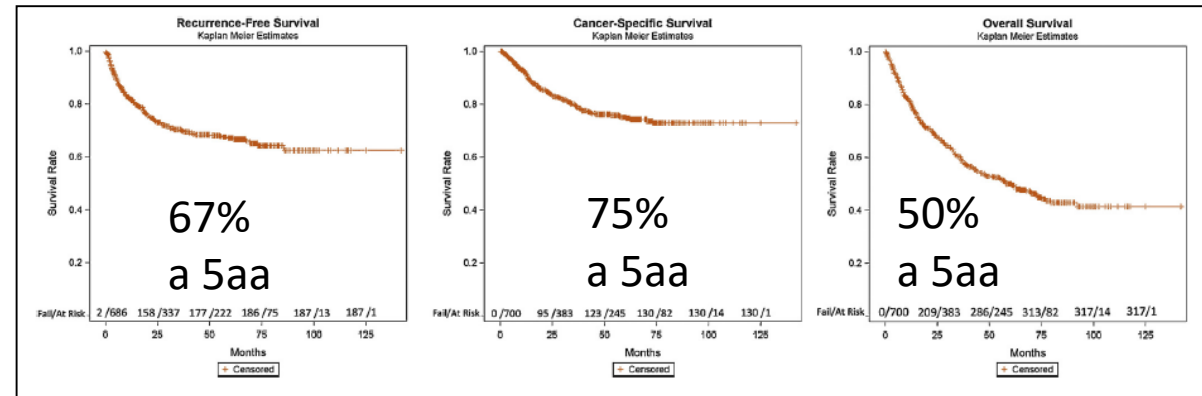
EUROPEAN UROLOGY 68 (2015) 721–728

Bladder Cancer

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

Syed Johar Raza^a, Timothy Wilson^b, James O. Peabody^c, Peter Wiklund^d, Douglas S. Scherr^c, Ali Al-Daghmin^a, Shiva Dibaj^a, Muhammad Shamim Khan^f, Prokar Dasgupta^f, Alex Mottrie^g, Mani Menon^c, Bertram Yuh^b, Lee Richstone^h, Matthias Saarⁱ, Michael Stoeckle^j, Abolfazl Hosseini^d, Jihad Kaouk^l, James L. Mohler^a, Koon-Ho Rha^h, Gregory Wilding^a, Khurshid A. Guru^{a,*}

- Studio retrospettivo multicentrico 743 pazienti
- Follow-up medio 67 mesi (IQR 18–84)



EUROPEAN UROLOGY 66 (2014) 920–928

available at www.sciencedirect.com
journal homepage: www.europeanurology.com

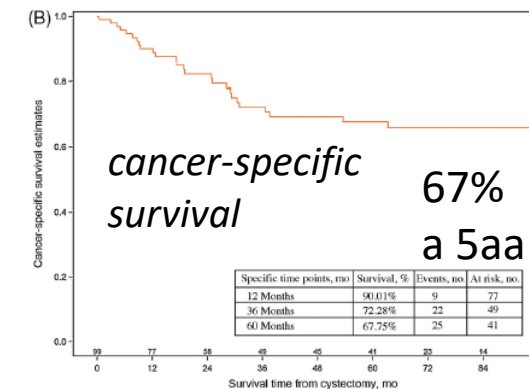
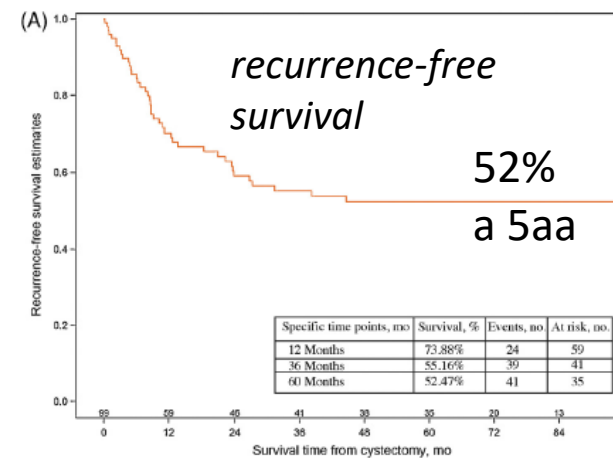


Bladder Cancer

Oncologic Outcomes Following Robot-assisted Radical Cystectomy with Minimum 5-year Follow-up: The Roswell Park Cancer Institute Experience

Syed Johar Raza^a, Ali Al-Daghmin^a, Sharon Zhuo^a, Zayn Mehboob^a, Katy Wang^b, Gregory Wilding^b, Eric Kauffman^{a,c}, Khurshid A. Guru^{a,*}

- Studio retrospettivo 99 pazienti
- Follow-up medio: 30.9 (12.7–70.8) mesi



Risultati «comparabili» con serie OPEN



La RARC, specialmente con derivazione continente intracorporea, è una procedura challenge, con una importante curva di apprendimento

RARC Pasadena Consensus Panel – Review

Editorial by Monish Aron and Inderbir S. Gill on pp. 361–362 of this issue

Best Practices in Robot-assisted Radical Cystectomy and Urinary Reconstruction: Recommendations of the Pasadena Consensus Panel

Table 3 – Recommended goals for robot-assisted radical cystectomy surgeons

Level of surgeon experience	Recommendations
Learning curve (first 20–30 cases)	<ul style="list-style-type: none">• Supervision by an experienced mentor• Operative times <7 h• Blood loss <400 ml• Complete lymphadenectomy• Overall margin status <7%• Use caution when operating on bulky tumors; obese patients; or patients with previous radiotherapy, surgery, or adhesions• Perform ileal conduit reconstructions only
Experienced (30–100 cases)	<ul style="list-style-type: none">• Operative times with ileal conduit ≤5 h, or with neobladder, ≤6 h• Blood loss ≤300 ml• Complete lymphadenectomy• Build ICUD experience
Very experienced (>100 cases)	<ul style="list-style-type: none">• Few contraindications• Operative times with ileal conduit ≤4 h, or with neobladder, ≤5 h• Blood loss ≤300 ml• Complete lymphadenectomy• Use neobladder or continent reconstruction in 25–50% of cases, as the case mix allows• Aim for Clavien-Dindo grades 3–5 complication rates of <30% of patients• Aim for length of stay of 5–10 d

ICUD = intracorporeal urinary diversion.

Il volume operatorio impatta sugli outcomes post RALP

2013

EUROPEAN UROLOGY 64 (2013) 786–798

available at www.sciencedirect.com
journal homepage: www.europeanurology.com



Collaborative Review – Prostate Cancer

A Systematic Review of the Volume–Outcome Relationship for Radical Prostatectomy

Quoc-Dien Trinh^{a,b,c,*}, Anders Bjartell^d, Stephen J. Freedland^e, Brent K. Hollenbeck^f, Jim C. Hu^g, Shahrokh F. Shariat^h, Maxine Sun^b, Andrew J. Vickersⁱ

Conclusions: Undeniable evidence suggests that increasing volume improves outcomes. Although it would seem reasonable to refer RP patients to high-volume centers, such regionalization may not be entirely practical. As such, the implications of such a shift in practice have yet to be fully determined and warrant further exploration.

Oggi

Conclusions: Contemporary evidence continues to support the relationship between high-volume surgeries with improved RP outcomes. Recent studies demonstrate that the volume–outcome relationship applies to robot-assisted RP and may be applied for potential cost savings in health care. An increase in the number of international studies suggests reproducibility of the association. Although regionalization of surgical care remains a contentious issue, there is an increasing body of evidence that short-term outcomes are improved at high-volume centers for RP.

EUROPEAN UROLOGY FOCUS XXX (2017) XXX–XXX

ARTICLE IN PRESS

EUROPEAN UROLOGY FOCUS XXX (2017) XXX–XXX

available at www.sciencedirect.com
journal homepage: www.europeanurology.com/eufocus



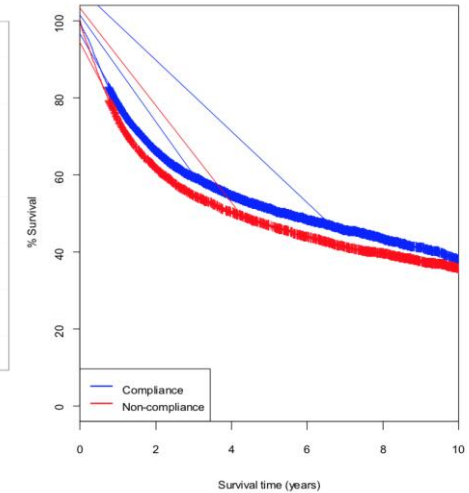
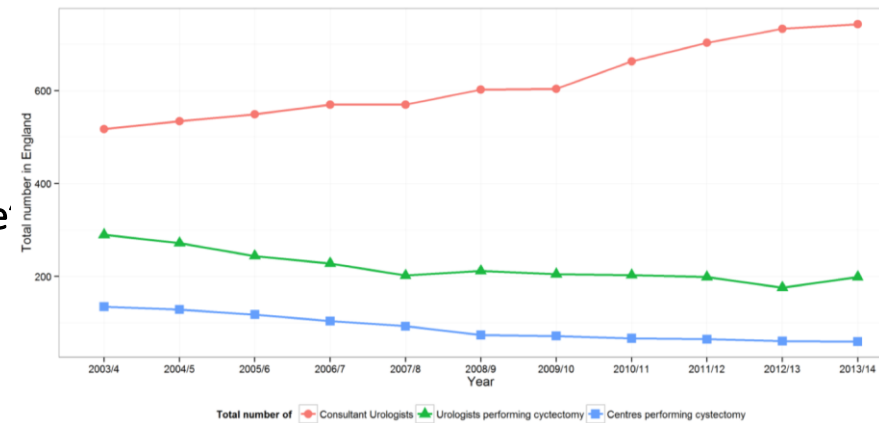
Review – Prostate Cancer

Systematic Review of the Volume–Outcome Relationship for Radical Prostatectomy: A 2017 Update

Jeffrey J. Leow^{a,b}, Eugene K. Leong^c, Emily C. Serrell^d, Steven L. Chang^a, Russell L. Gruen^c, Keng Siang Png^b, Lisa T. Beaulieu^{d,e,f}, Quoc-Dien Trinh^a, Mani M. Menon^g, Jesse D. Sammon^{d,e,i,*}

Open vs robotic radical cystectomy: *Surgeon and Center factors*

Afshar M, Goodfellow H, Jackson-Spence F et al. Centralisation of radical cystectomies for bladder cancer in England, a decade on from the 'Improving Outcomes Guidance' the case for super centralisation. BJU Int 2018; 121: 217–24



Examining the role of centralisation of radical cystectomy for bladder cancer

Thomas Seisen 

© 2018 The Authors
BJU International © 2018 BJU International

Department of Urology, Pitié Salpêtrière Hospital, Assistance
Publique des Hôpitaux de Paris, Paris Sorbonne University,
Paris, France

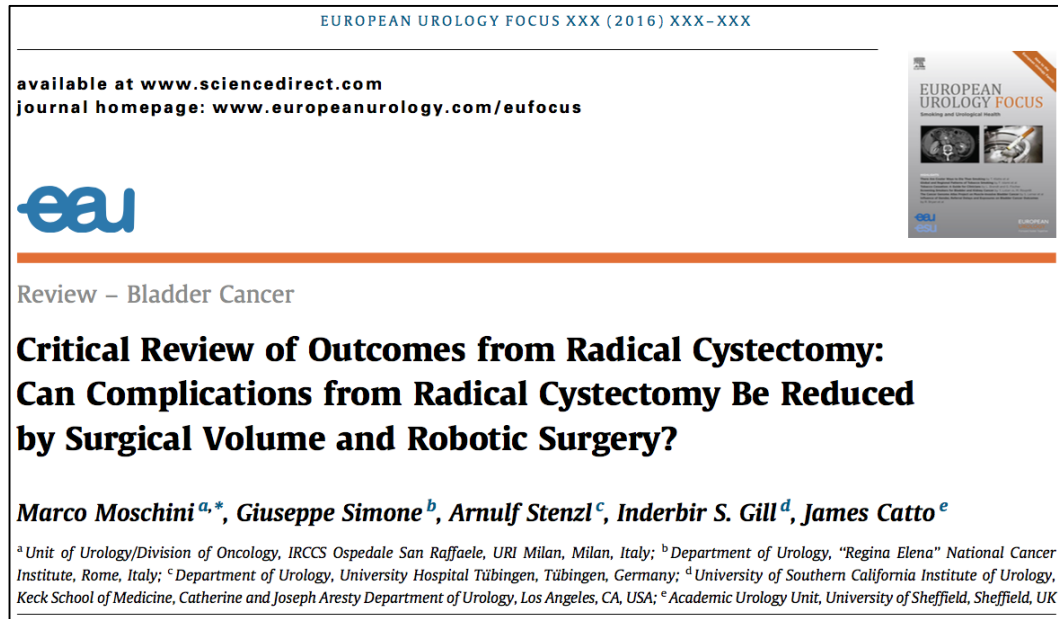
The implementation of robot-assisted techniques and enhanced recovery protocols may help to reduce surgical stress and facilitate discharge after early rehabilitation.

Nonetheless, such valuable interventions are **more likely to be delivered at expert centres in MIBC management.**

Given that surgical experience mostly comes from surgical volume, numerous studies suggest that there is an **inverse relationship** between hospital as well as surgeon volume and morbidities for major surgeries including RC.

Virtually all available evidence, including the study by Afshar et al., converge toward the **general concept** that RC patients should be managed by experienced urologists operating at expert centres with trained surgical teams.

Open vs robotic radical cystectomy: *Surgeon and Center factors*



Open RC (ORC) and robot-assisted RC (RARC) are morbid procedures with consistent risk of perioperative complications (mean weighted incidence: **48.7%**; range: 27.0-72.5%).

Higher hospital and surgeon volumes were associated with reduced risks of perioperative complications.

Prior robotic expertise in radical prostatectomy showed a beneficial protective risk on development of complications after RARC.

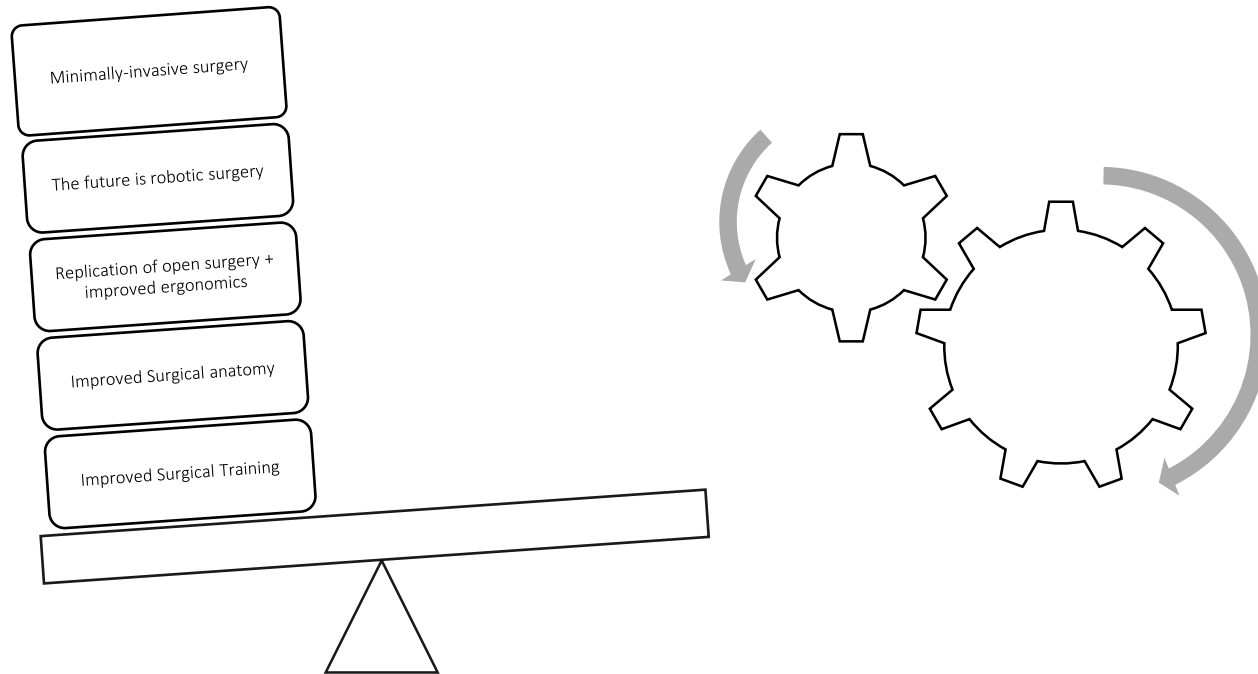
Surgical volume appears to be a good predictor of safety in ORC and RARC.

RARC is associated with reduced estimated blood loss and lower perioperative transfusion rates compared with ORC.

Further evidence is needed to support the reproducibility of intracorporeal diversion during RARC, beyond large tertiary referral centers.

Open vs Robotic Radical Cystectomy: *PRO ROBOTICS*

However...for an **effective** robotic cystectomy....



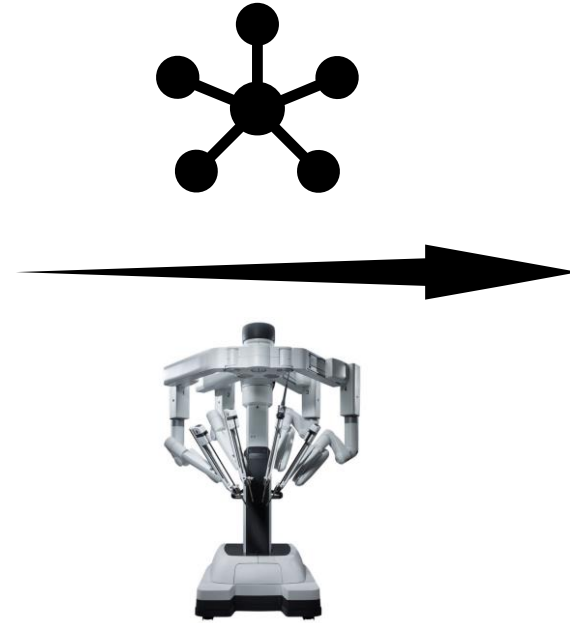
1. The surgeon makes the difference

2. (Multidisciplinary) Team working is essential

3. Patient selection is essential

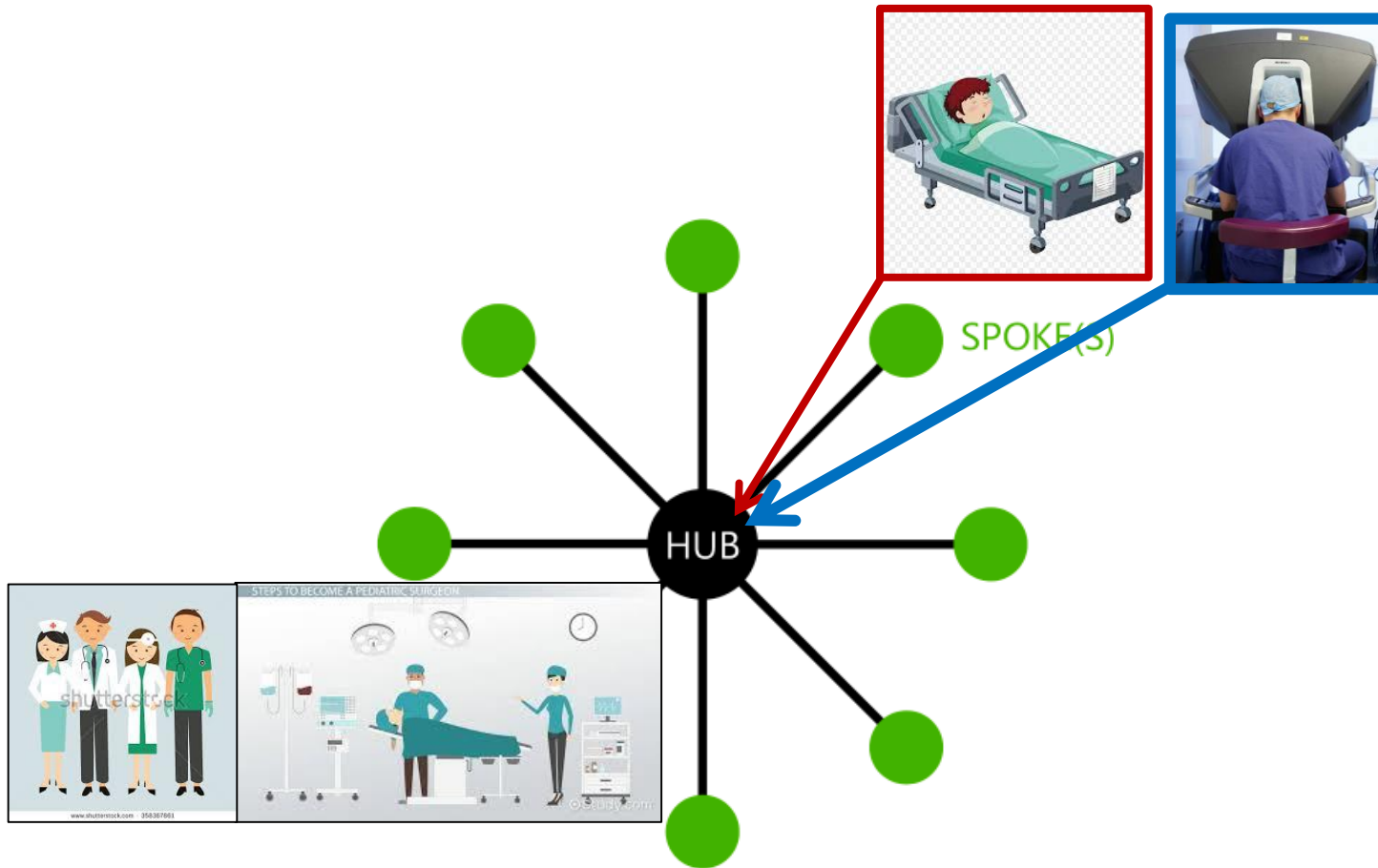
4. Technical and non-technical skills are essential

La robotica in uro-oncologia è uno strumento indispensabile Il cui utilizzo dovrebbe essere centralizzato



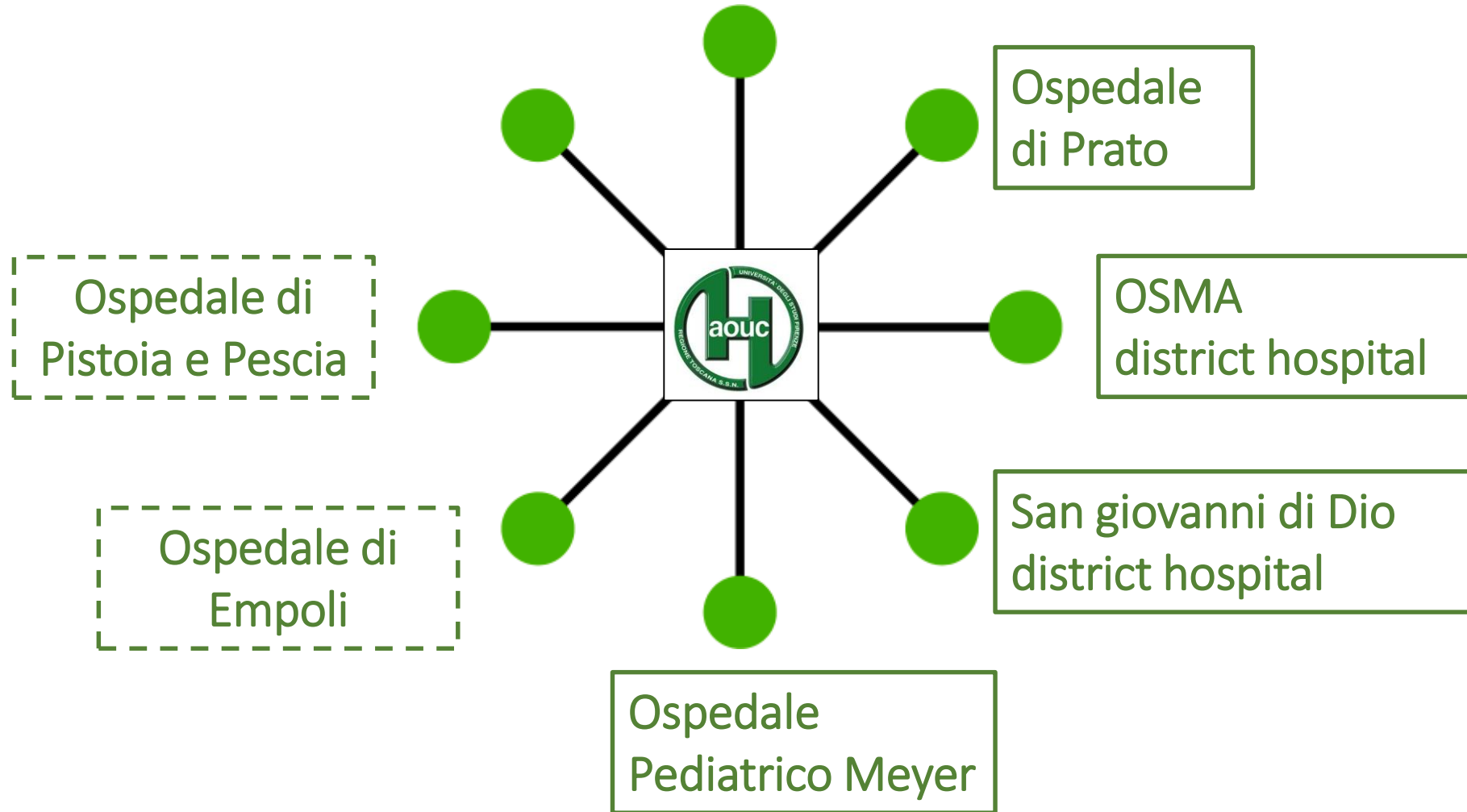
Il modello hub&spoke può essere la risposta

Modello «modificato» hub & spoke



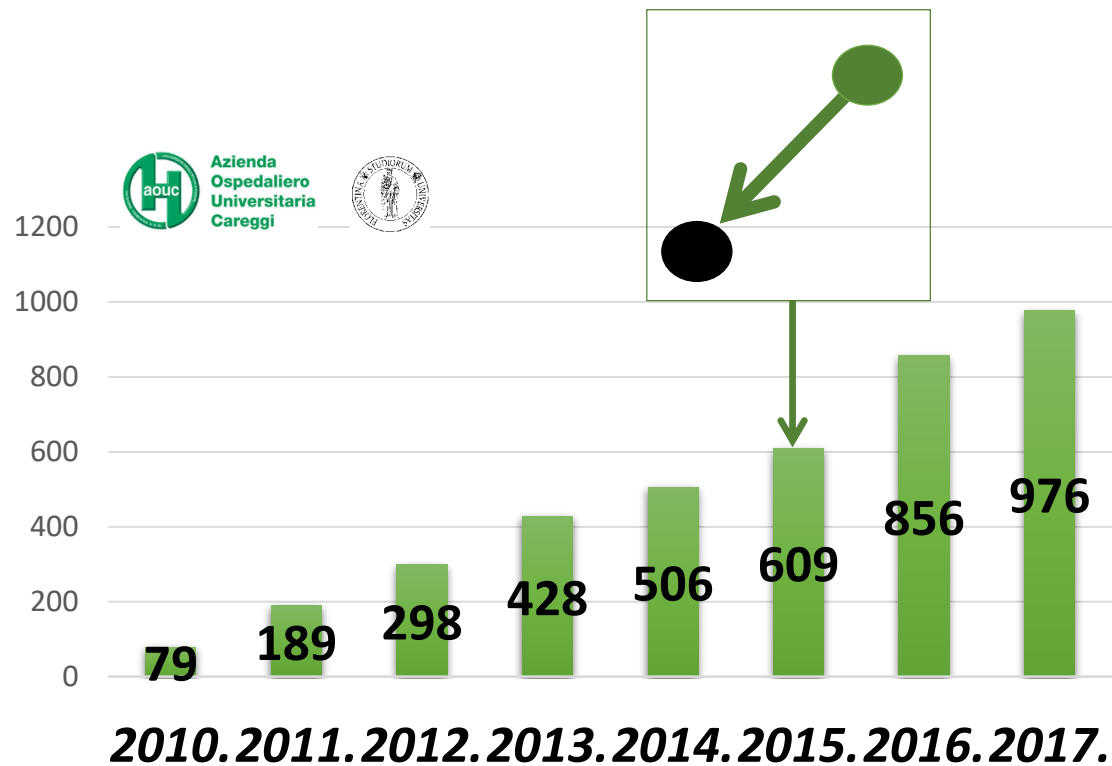
- Increased **surgeon's respect**: avoiding the creation of A and B level surgeons
- Increase the inherent **advantages** of the standard system **for the patients**
- Increase the **overall quality of the national health system**

The «modified» hub & spoke model *at our Department*



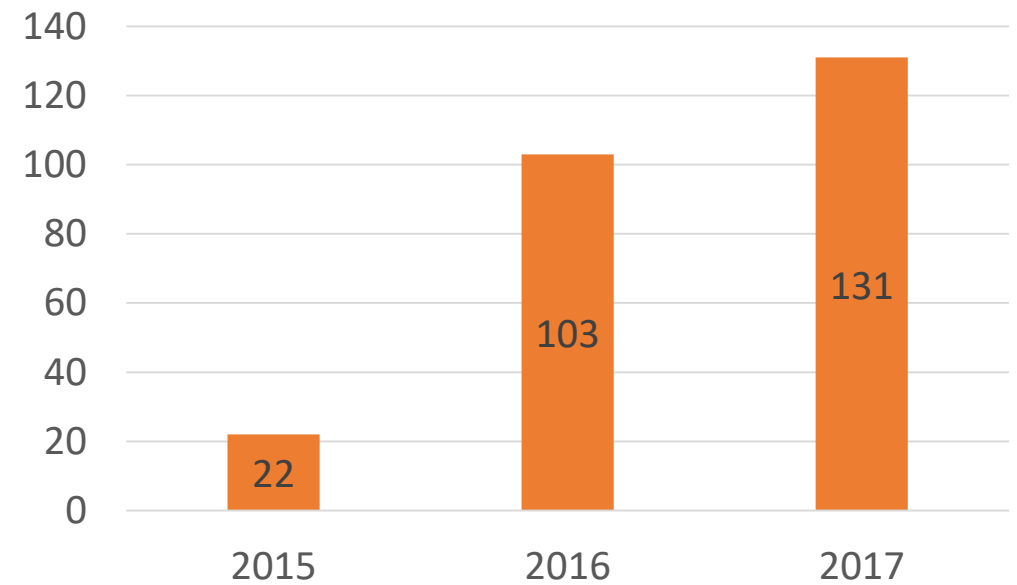
Modello «modificato» hub & spoke nel nostro dipartimento

Robotic procedures at the Urologic Department AOUC Florence per year

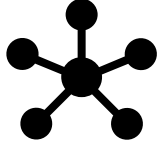


Robotic procedures performed at the Urologic Department AOUC Florence by «spoke» Centers per year

4 surgeons from 3 Centers



Key advantages of the «modified» hub & spoke model



Higher surgical volume



Better patient outcomes



REVIEW



Relationship of surgeon/hospital volume with outcomes in uro-oncology surgery

Pietro Grande^{a,b}, Riccardo Campi^{a,c}, and Morgan Rouprêt^a

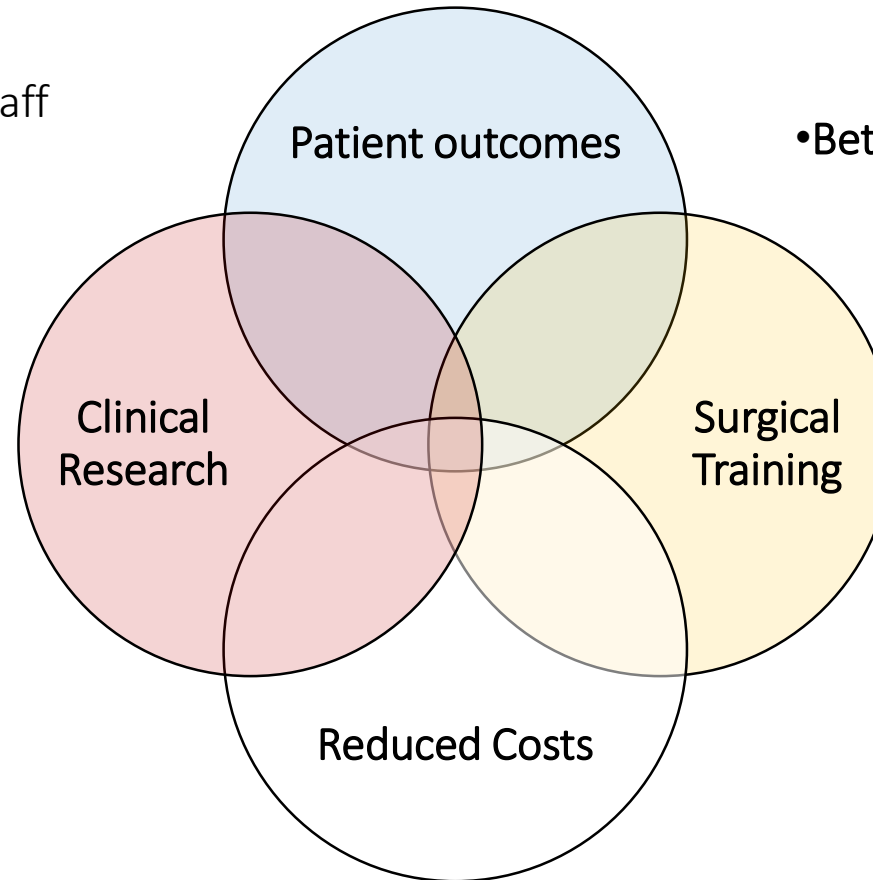
KEY POINTS

- Regionalization of major uro-oncologic surgery is in high demand.
- Available studies showed a volume–outcome relationship in radical cystectomy, radical prostatectomy and partial nephrectomy.
- High-volume centers have lower postoperative complications, mortality, and better long-term oncological and functional outcomes after radical cystectomy.
- Radical prostatectomy has better oncological and functional results in high-volume centers, and is also more cost-effective.
- Partial nephrectomy has higher success rate and lower morbidity in a high-volume setting.

VANTAGGI del Modello «**modificato**» hub & spoke

- Availability of the **advanced surgical system**
- **Direct answers** to patients need
- **Up to date** treatments options for challenging cases
- **No need** for anesthesiologists and staff nurse training

- Increased **N° of total** and per procedure robotic cases
- Increased **N° of challenging robotic cases**



- **Better functional and oncological outcomes** during the learning curve phase

- Increased interaction with **pharma companies** involved in robotics
- Increased national and international **centre visibility**
- **Increased clinical research** either single centre or multicentre


- **Proctoring** always available from the HUB surgeons
- **Less steep learning curve**
- Allows doctors in training to gain **broad experience**

Modular surgical training

RALP

EUROPEAN UROLOGY FOCUS 2 (2016) 105-108

available at www.sciencedirect.com
journal homepage: www.europeanurology.com/eufocus



Clinical Trial Update - Education

The European Association of Urology Robotic Training Curriculum: An Update

Alexandre Mottrie^{a,b,*}, Giacomo Novara^{a,c}, Henk van der Poel^d, Prokar Dasgupta^e, Francesco Montorsi^f, Giorgio Gandaglia^{a,f}

^aOLV Vattikuti Robotic Surgery Institute, Melle, Belgium; ^bDepartment of Urology, Onze-Lieve-Vrouw Hospital, Aalst, Belgium; ^cUrology Clinic, Department of Surgery, Oncology, and Gastroenterology, University of Padua, Padua, Italy; ^dDepartment of Urology, Netherlands Cancer Institute, Amsterdam, The Netherlands; ^eGuy's Hospital, King's College London, London, UK; ^fDivision of Oncology/Unit of Urology, URL IRCCS Ospedale San Raffaele, Milan, Italy

RAPN

33rd Annual EAU Congress Copenhagen

473 Definition of a structured training curriculum for robot-assisted partial nephrectomy: A Delphi-consensus study from the ERUS Educational Board

Eur Urol Suppl 2018; 17(2):e678

Larcher A.¹, Turri F.¹, Collins J.², Derweesh I.³, Volpe A.⁴, Kaouk J.⁵, Ficarra V.⁶, Porpiglia F.⁷, Capitanio U.⁸, Siemer S.⁹, Rha K.¹⁰, Stolzenburg J.U.¹¹, Ahlawat R.¹², Murphy D.¹³, De Naeyer G.¹⁴, Vaessen C.¹⁵, Challacombe B.¹⁶, Novara G.¹⁷, Porter J.¹⁸, Moon D.¹⁹, Buffi N.²⁰, Minervini A.²¹, Ploumidis A.²², Montorsi F.⁸, Wiklund P.², Van Der Poel H.²³, Mottrie A.¹

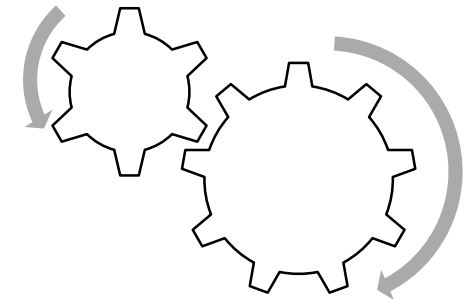


Figure 1A - Structure of the simulation-based training module of the ERUS Curriculum for robot-assisted partial nephrectomy.

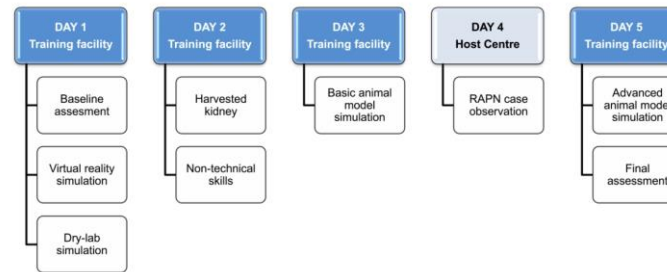


Figure 1B - Structure of the modular console activity-based training module of the ERUS Curriculum for robot-assisted partial nephrectomy.

RAPN individual steps	Level of complexity	Repetition needed for step completion
I. Patient and trocar placement	1/5	20
II. Liver/bowel mobilization	2/5	15
III. Hilum control	4/5	7
IV. Gerota fascia opening	3/5	10
V. US and tumour demarcation	3/5	10
VI. Artery clamping and de-clamping	3/5	10
VII. Tumour excision	5/5	5
VIII. Inner renorrhaphy	5/5	5
IX. Outer renorrhaphy	4/5	7
X. Gerota fascia closure	1/5	20

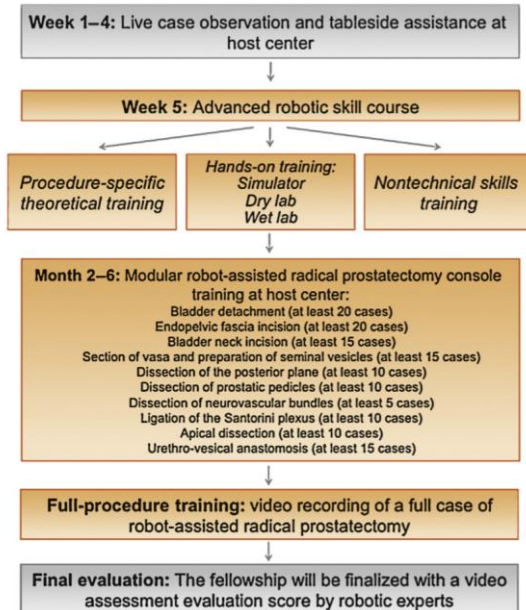


Fig. 2 - Structure of the European Association of Urology robotic training curriculum.



Certificate

Clinica Urologica - AOUC -
Università di Firenze

is certified as
ERUS Robotic Training Centre

Date: 1 November 2015

[Signatures]
Prof. Dr. A. Mottrie (ERUS) Dr. J. Paliou (ESU) Prof. H. Van Poppel (EAU)

erud esu eau



Grazie dell'attenzione



Prof. Andrea Minervini

Department of Oncologic Minimally-Invasive Urology and Andrology,
Careggi Hospital, University of Florence, Italy

