

**CORSO
DI CHIRURGIA
PELVICA
ONCOLOGICA
MININVASIVA:
UP TO DATE**

17 - 18 GENNAIO 2019

POTENZA

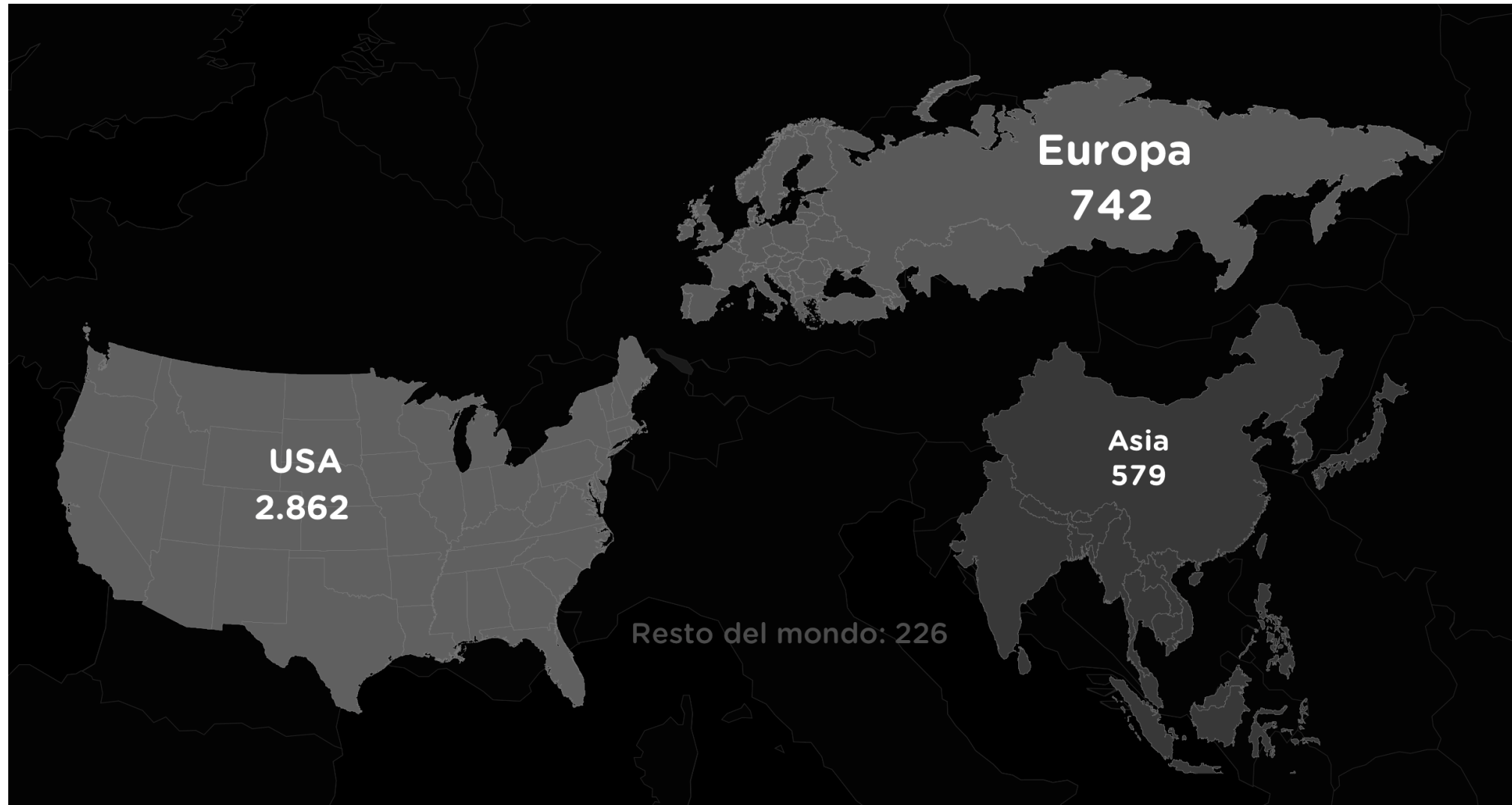
Azienda Ospedaliera San Carlo
U.O. UROLOGIA

Prof. Giuseppe Carrieri

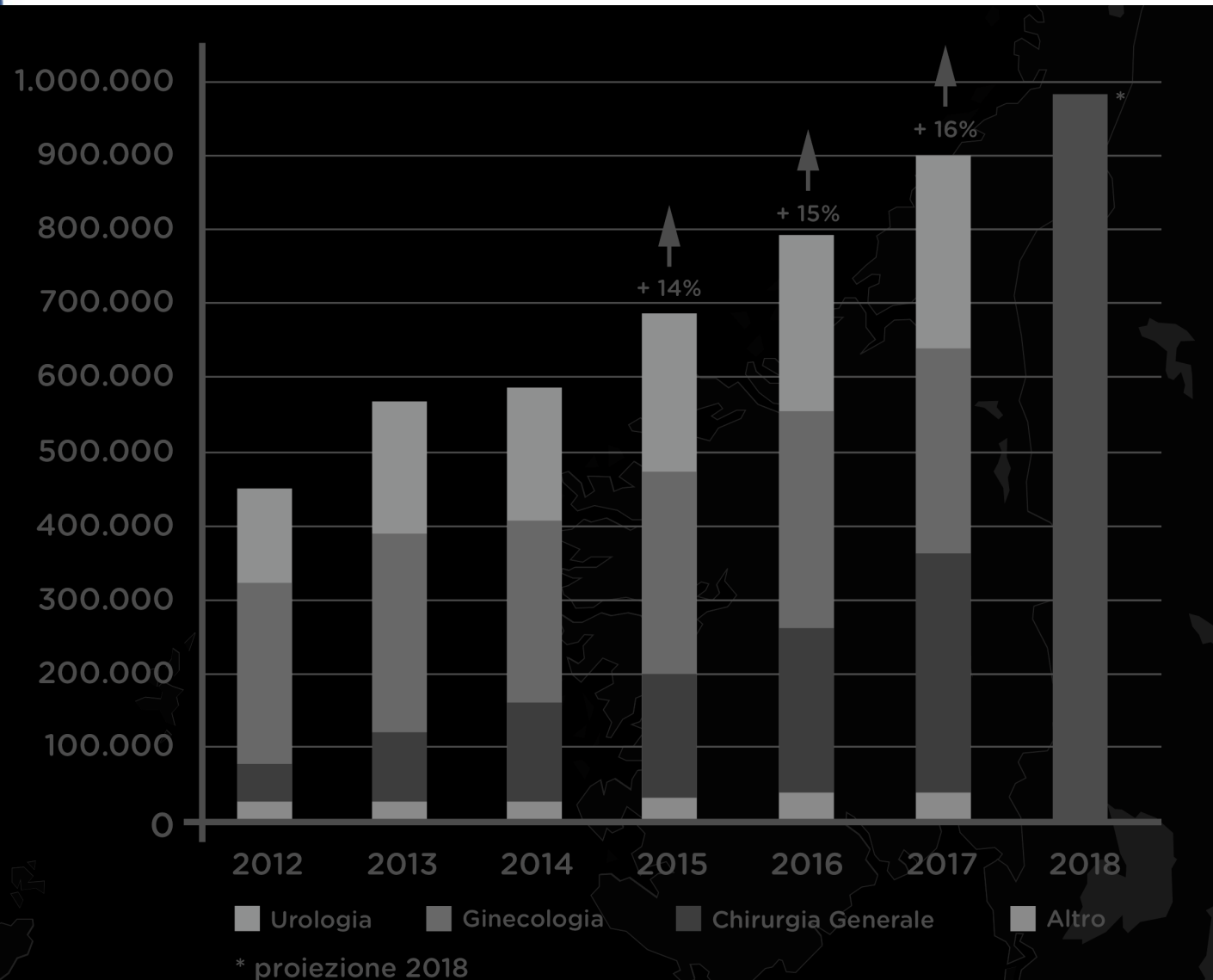
Department of Urology, Robotic Surgery and Renal Transplantation

University of Foggia, Italy

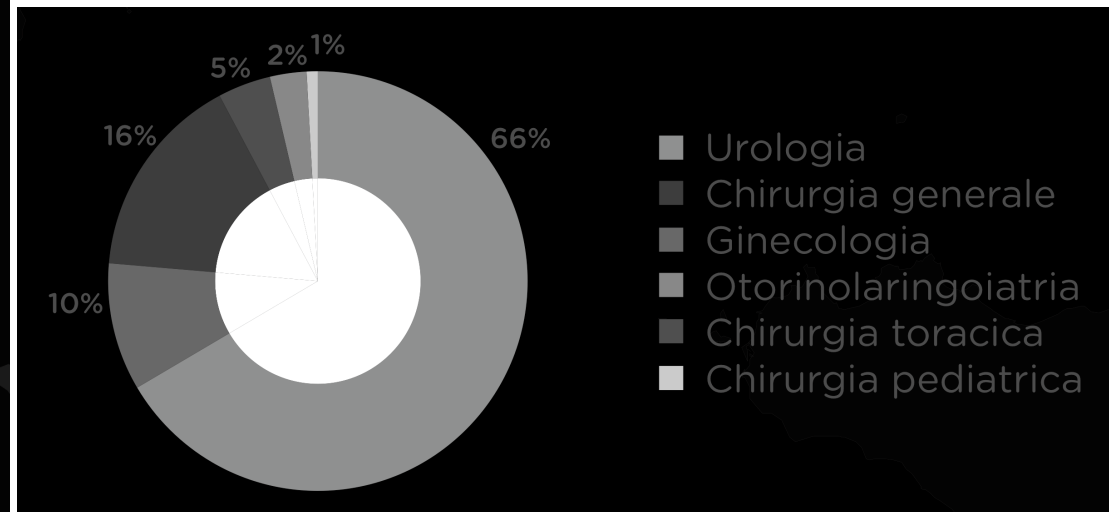
DA VINCI WORLDWIDE – END OF 2017



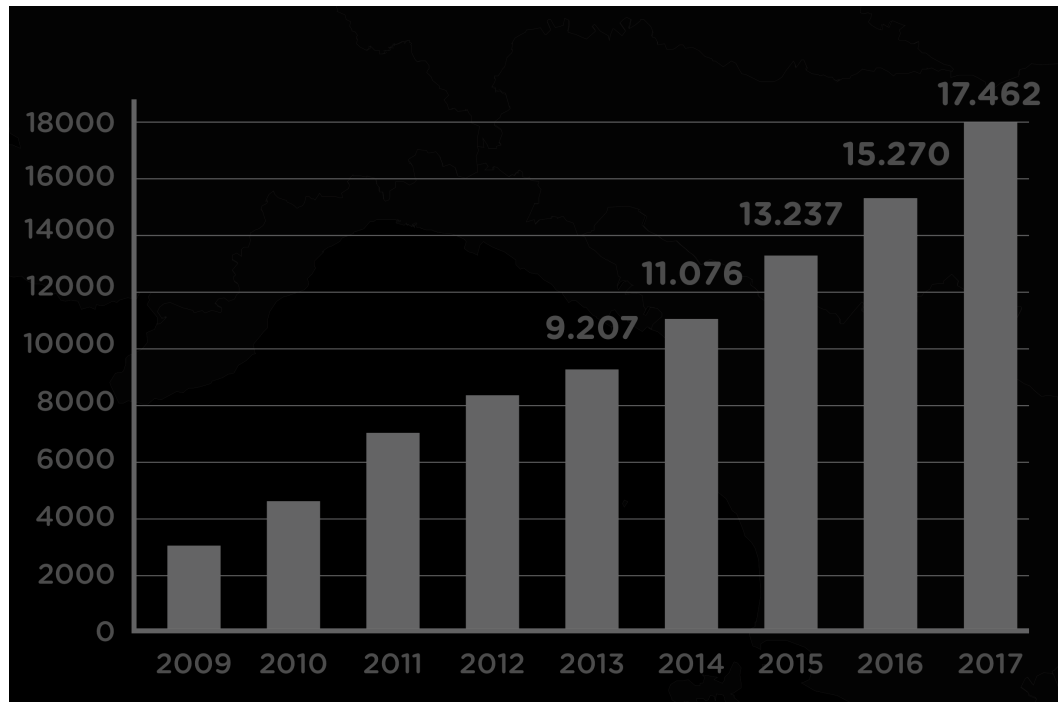
ROBOTIC SURGERY WORLDWIDE



IN ITALIA

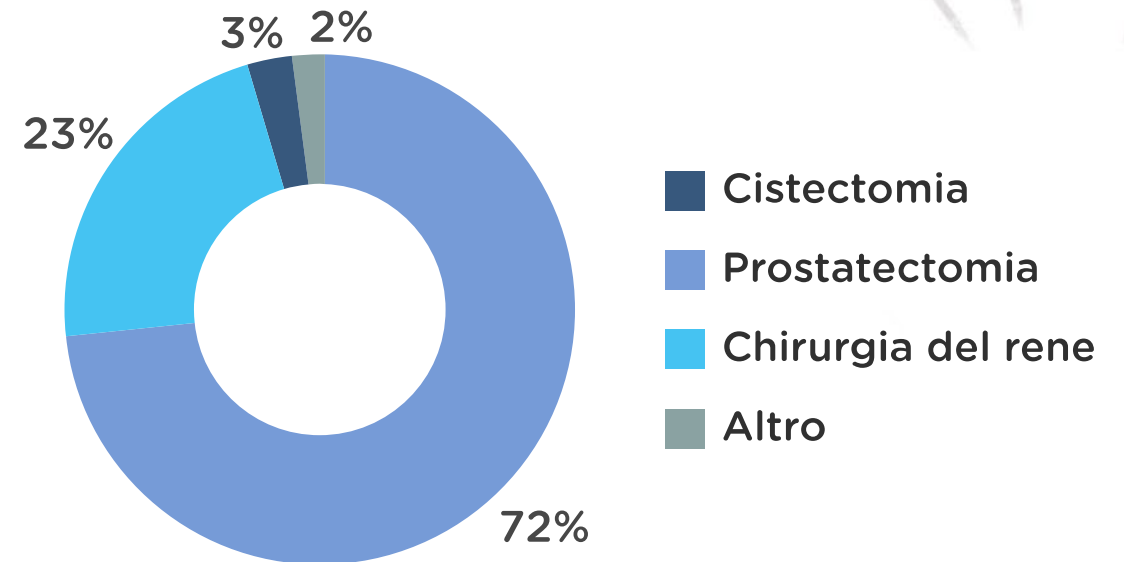
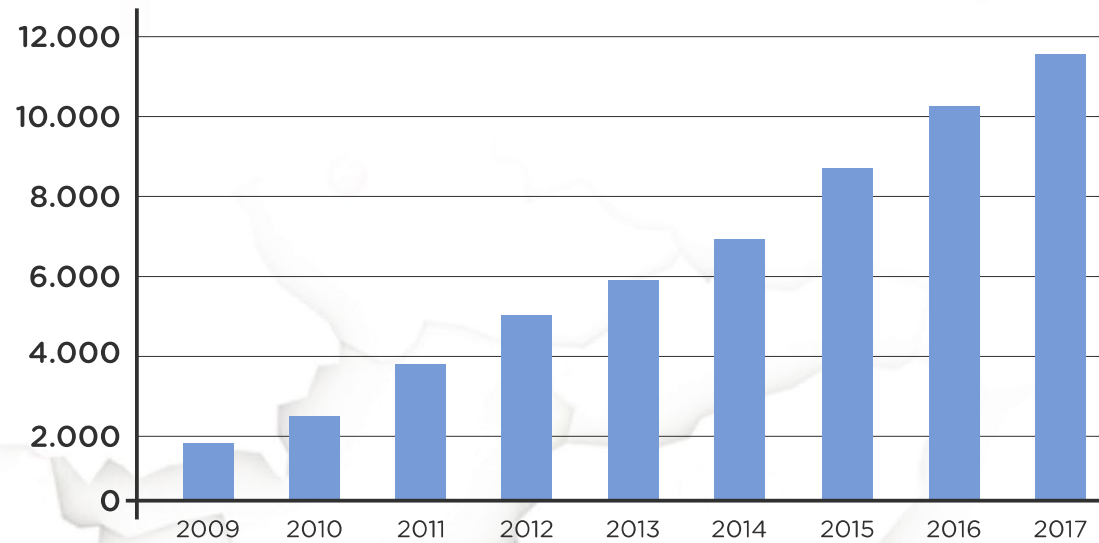


CHIRURGIA ROBOTICA IN ITALIA - 2017



CHIRURGIA ROBOTICA UROLOGICA IN ITALIA

Procedure urologiche



Robotic Assisted Radical Prostatectomy



BJU International (2001), 87, 408–410

POINT OF TECHNIQUE

Robotically-assisted laparoscopic radical prostatectomy

J. BINDER and W. KRAMER

Department of Urology and Paediatric Urology, University Hospital, Johann-Wolfgang-Goethe University, Frankfurt am Main, Germany

23 May 2000

◆ COMMUNICATION RAPIDE

Progrès en Urologie (2000), 10, 520-523

Prostatectomie radicale laparoscopique réalisée à distance par robot. A propos d'un cas

Clément-Claude ABBOU, Andràs HOZNEK, Laurent SALOMON, Adrian LOBONTIU,
Fabien SAINT, Antony CICCO, Patrick ANTIPHON, Dominique CHOPIN

Service d'Urologie, Hôpital Henri Mondor, Créteil, France



L'INIZIO DELL'ESPERIENZA PERSONALE



Foggia, 13 gennaio 2016
DIR. GENERALE DR. ANTONIO PEDOTA



of THE JOURNAL UROLOGY®



Official Journal of the
American
Urological
Association

LBA3

THE CHANGING FACE OF UROLOGIC ONCOLOGIC SURGERY FROM 2000-2018 (63 141 PATIENTS) - IMPACT OF ROBOTICS

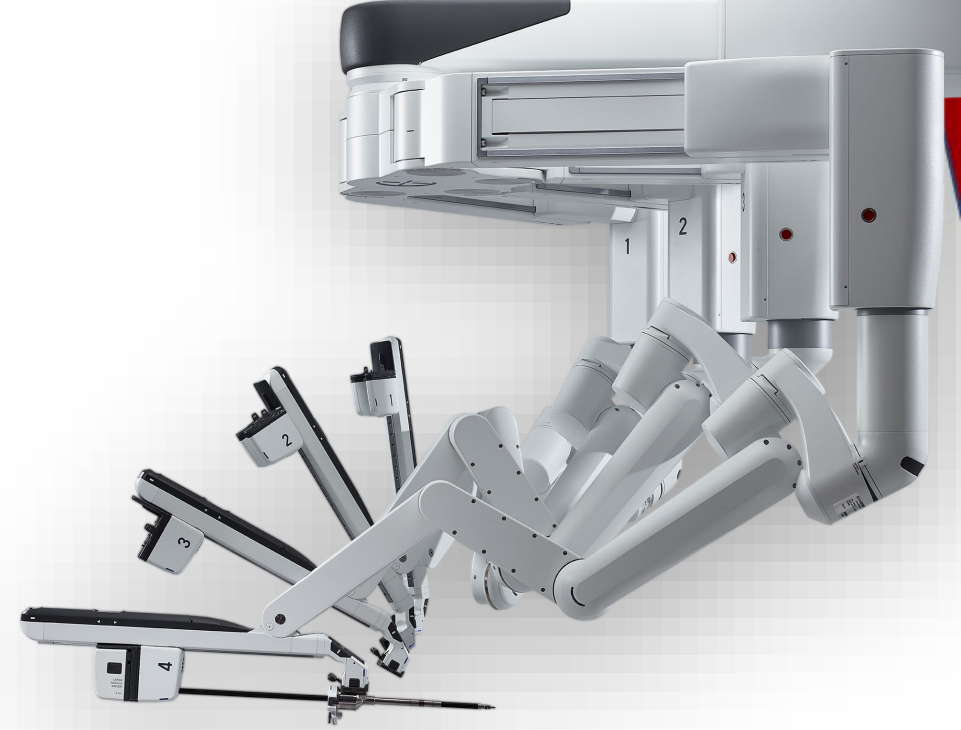
Inderbir Gill, Giovanni Cacciamani, Los Angeles, CA*

Vol. 199, No. 4S, Supplement, Saturday, May 19, 2018

THE JOURNAL OF UROLOGY® e577

DEPARTMENT OF UROLOGY
Robotic Surgery
Renal Transplantation





THE CHANGING FACE OF URO-ONCOLOGIC SURGERY:

THE IMPACT OF ROBOTICS

To evaluate the current status of urologic oncologic surgery by comparing outcomes of open and robotic surgery over the past 17 years.

(01/01/2000 - 12/31/2017)

Specific Aim

63141 pazienti!



TRANSPARENT REPORTING OF
SYSTEMATIC REVIEWS AND
META-ANALYSES



METHODS GUIDE FOR
EFFECTIVENESS AND
COMPARATIVE EFFECTIVENESS
REVIEWS



OXFORD
LEVEL OF EVIDENCE CRITERIA



Cochrane



DEPARTMENT OF UROLOGY
Robotic Surgery
Renal Transplantation



5 Key Questions (KQs) **(Open vs Robotic)**

KQ1: Comparative penetrance in the field

KQ2: Peri-operative outcomes

KQ3: Oncologic outcomes & Survival

KQ4: Functional outcomes

KQ5: Financial costs

5 Key Questions (KQs) (Open vs Robotic)

KQ1: Comparative penetrance in the field

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KQ3: Oncologic outcomes & Survival

KQ4: Functional outcomes

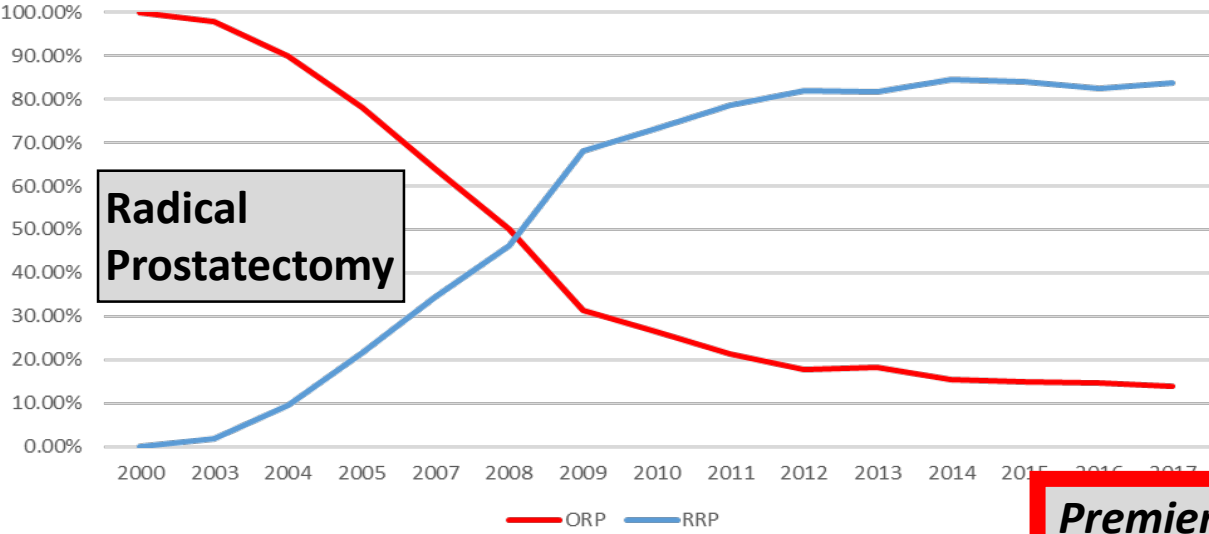
KQ5: Financial costs

Penetrance in the Field – Open vs Robotic

Premiere Database
2000-2017

Penetrance in the Field – Open vs Robotic

ORP vs RRP, % cases/yr

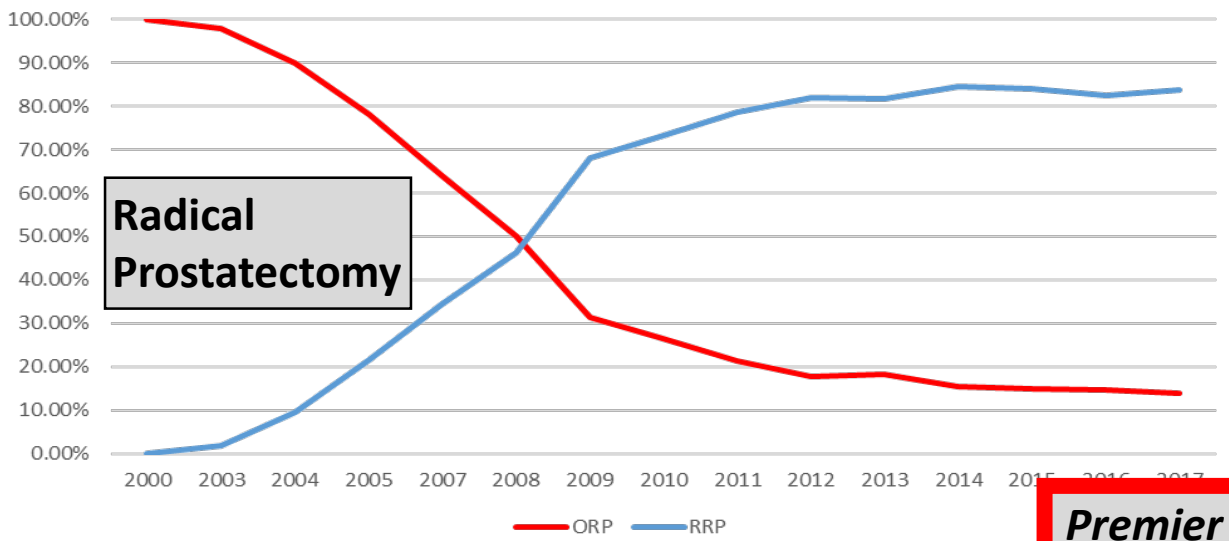


Radical Prostatectomy

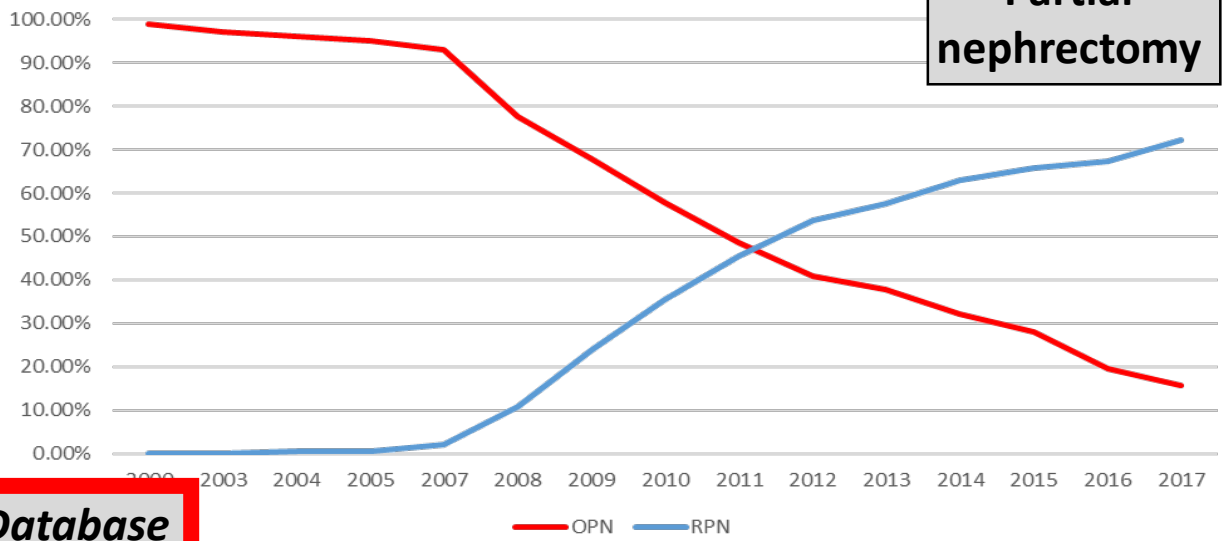
**Premier Database
2000-2017**

Penetrance in the Field – Open vs Robotic

ORP vs RRP, % cases/yr



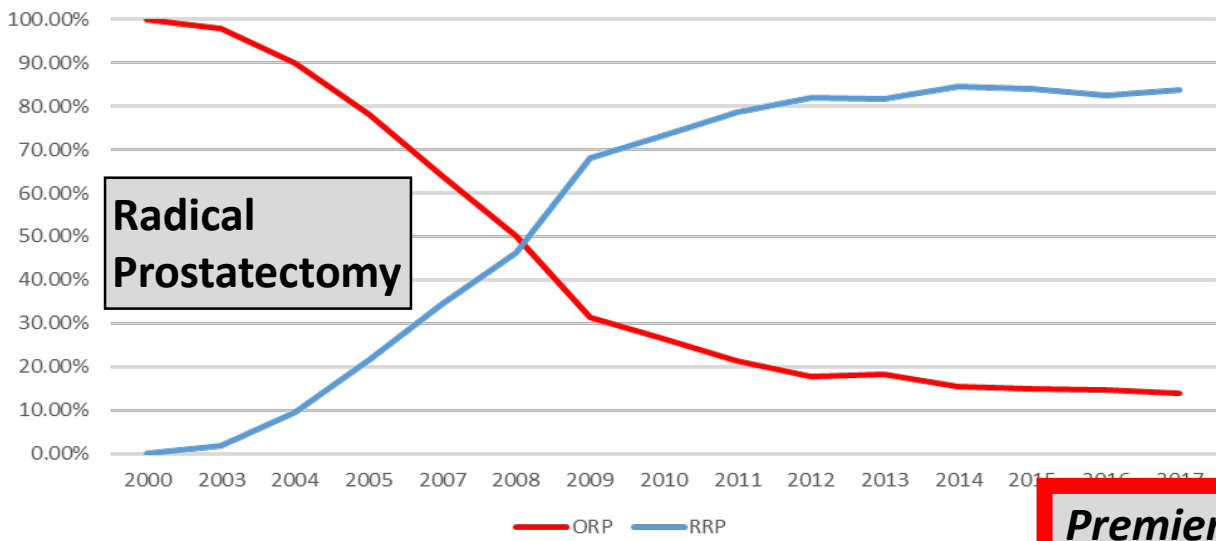
OPN vs RPN, % cases/yr



**Premier Database
2000-2017**

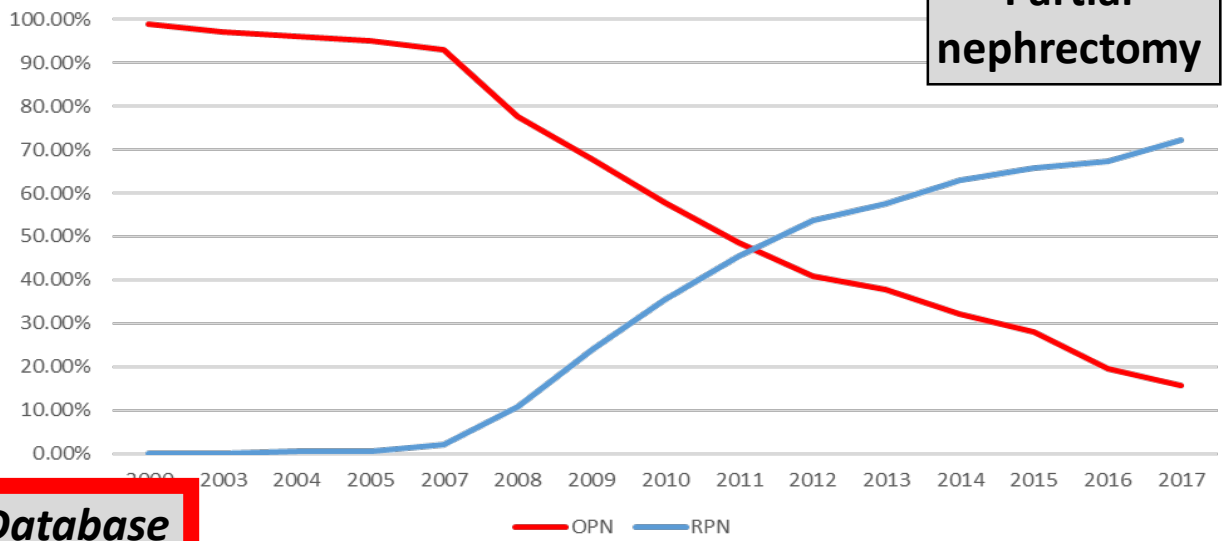
Penetrance in the Field – Open vs Robotic

ORP vs RRP, % cases/yr



Radical Prostatectomy

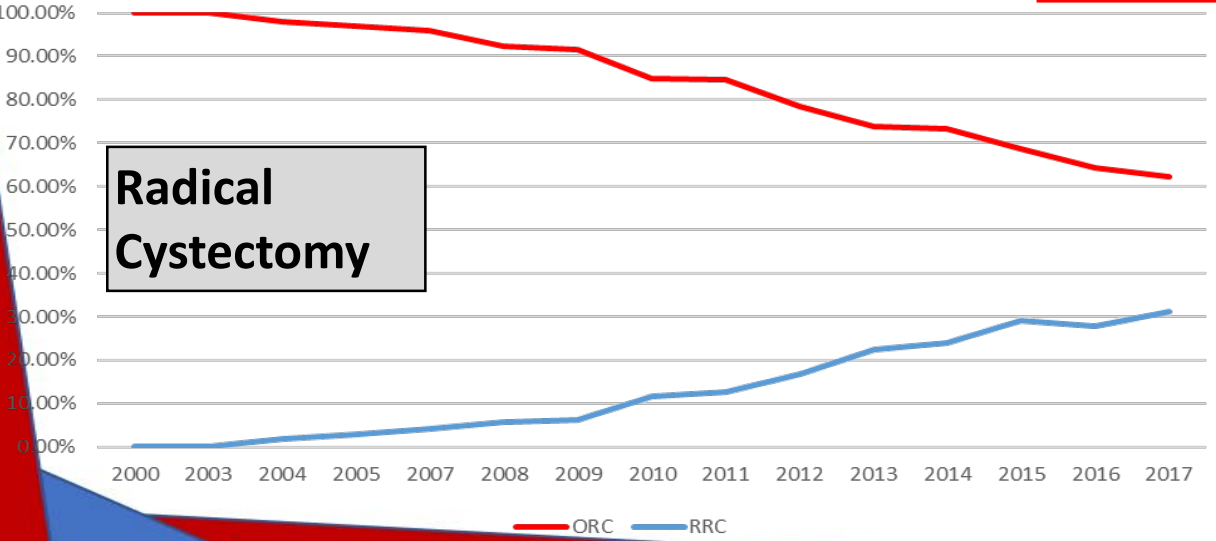
OPN vs RPN, % cases/yr



Partial nephrectomy

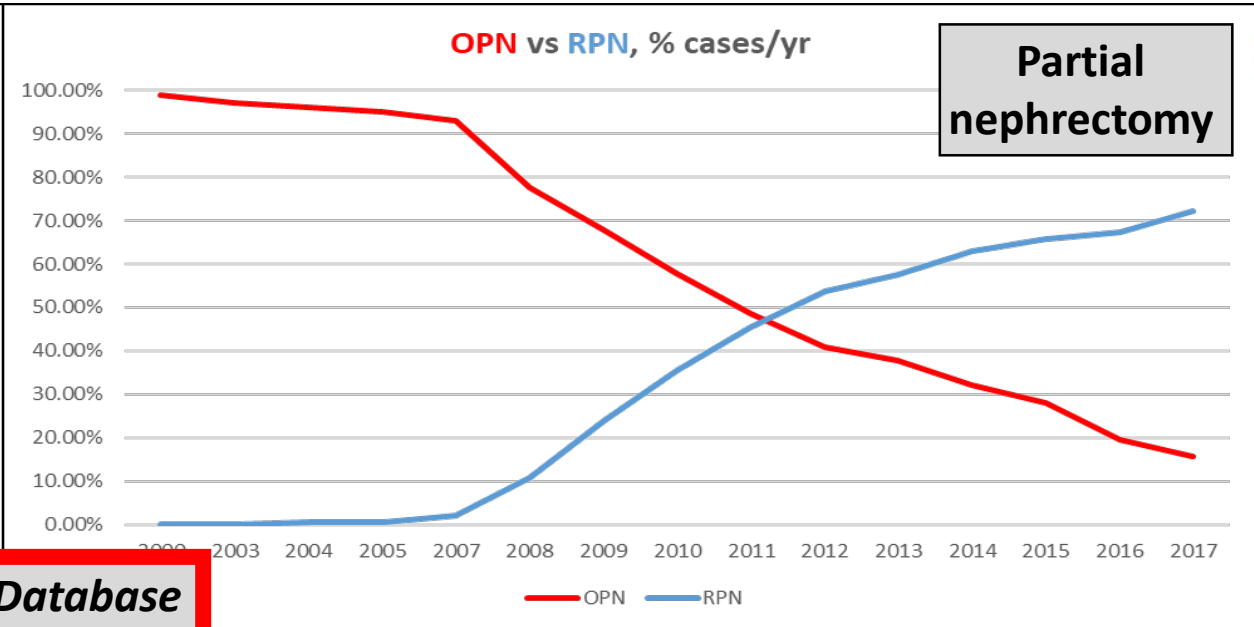
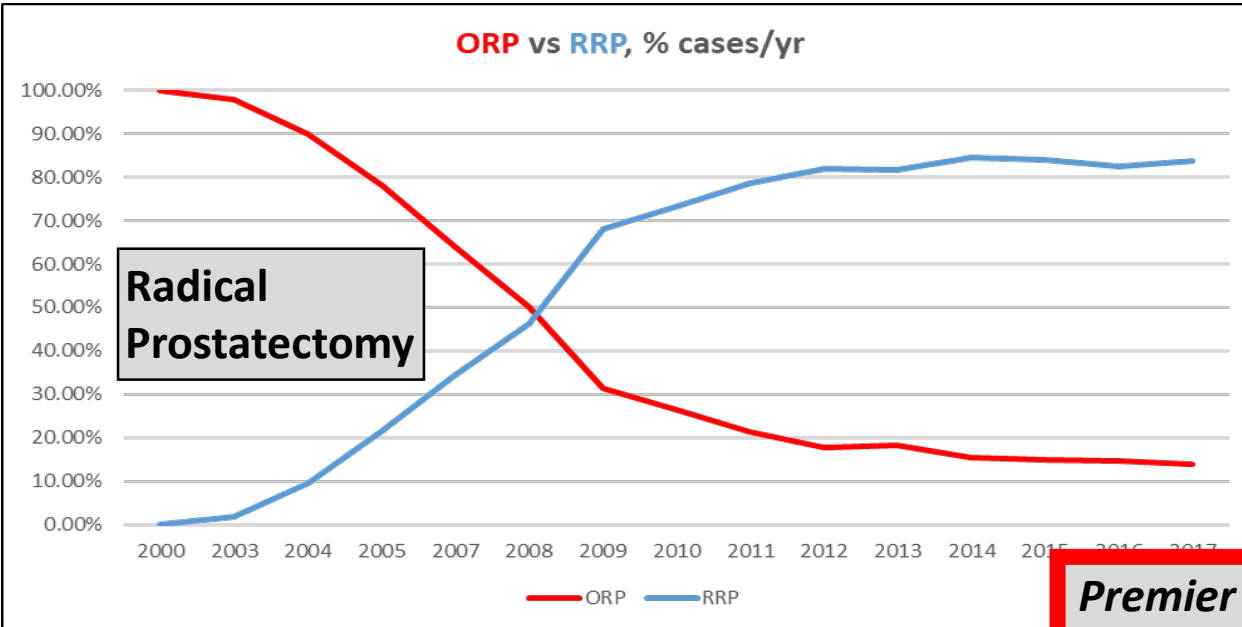
Premier Database 2000-2017

ORC vs RRC, % cases/yr

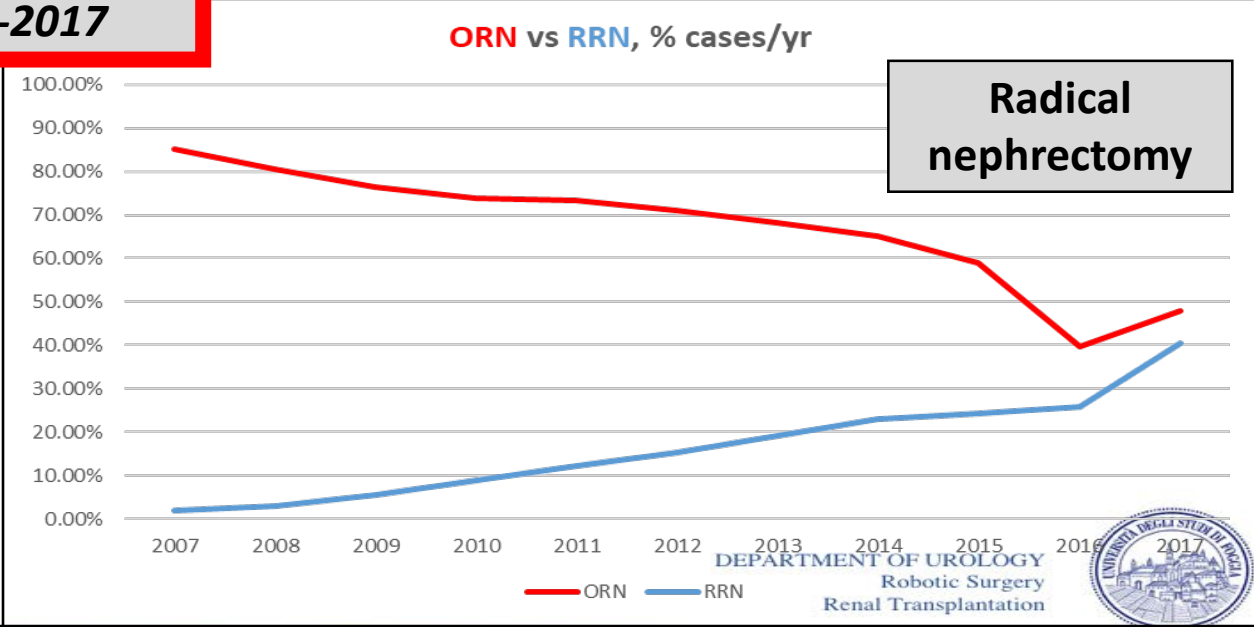
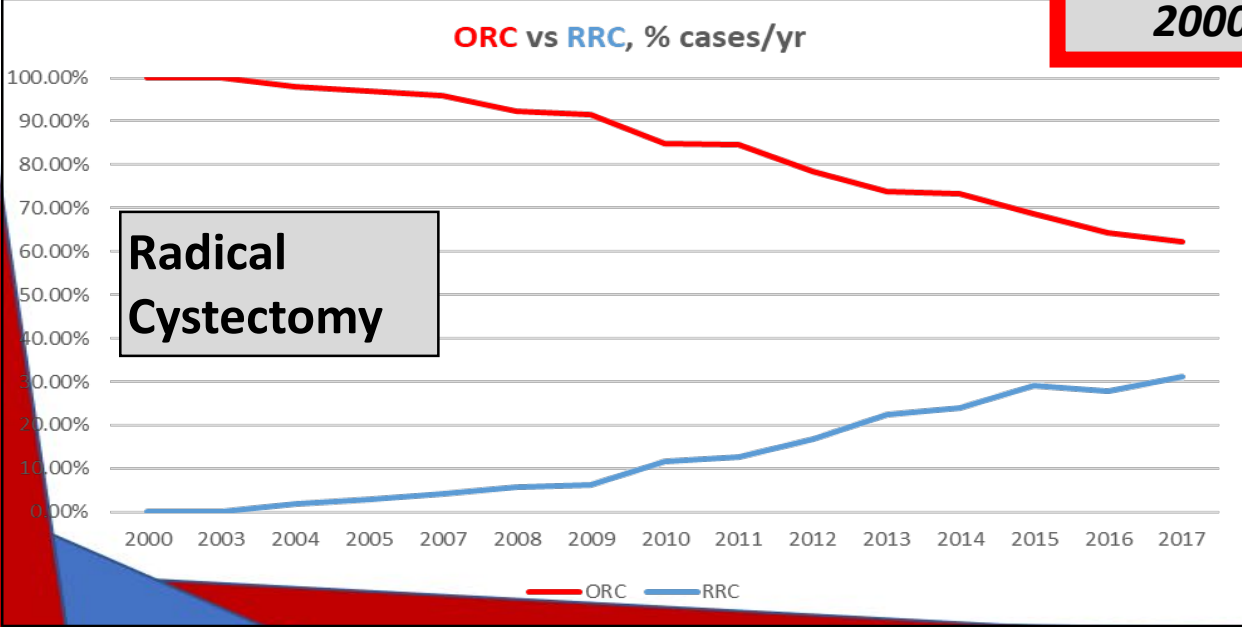


Radical Cystectomy

Penetrance in the Field – Open vs Robotic



**Premier Database
2000-2017**



Penetrance in the Field – Open vs Robotic

Premier Database - 700 US hospitals

	Total no. of prostate, kidney & bladder cancer surgeries	Open	Robotic
2005	105,300	70%	30%

Penetrance in the Field – Open vs Robotic

Premiere Database - 700 US hospitals

2005	Total no. of prostate, kidney & bladder cancer surgeries	Open	Robotic
	105,300	70%	30%

2017	Total no. of prostate, kidney & bladder cancer surgeries	Open	Robotic
	88,198	31%	69%



Penetrance in the Field – Open vs Robotic

Urologic Oncologic Surgery

ROBOTIC Surgery	2005	2017	Increase
Radical Prostatectomy	20%	85%	4-fold
Partial Nephrectomy	0.6%	66%	110-fold
Radical Nephrectomy	2.7%	24%	9-fold
Radical Cystectomy	3%	33%	11-fold



5 Key Questions (KQs) (Open vs Robotic)

KQ1: Comparative penetrance in the field

KQ2: Peri-operative outcomes

KQ3: Oncologic outcomes & Survival

KQ4: Functional outcomes

KQ5: Financial costs

Research plan

- RADICAL PROSTATECTOMY**
(n= 42 740)
- PARTIAL NEPHRECTOMY**
(n= 12 687)
- RADICAL CYSTECTOMY**
(n= 14 202)
- RADICAL NEPHRECTOMY**
(n= 11 912)
- RPLND**
(n= 1 596)

**ALL STUDIES, NO LANGUAGE
RESTRICTION**
1st Jan 2000- 1st Jan 2018

PubMed

PUBMED
(n=25 257)

Scopus

SCOPUS
(n=27 493)

WEB OF SCIENCE™

Web of Science
(n=30 377)

Total no. articles identified

(n= 83 127)

Articles about robotic approach

(n= 10 894)

Compared Open vs Robotic Outcomes

- Prospective randomized trials
- Non-randomized trials
- Retrospective comparative studies

Total : 181 papers

Articles deleted

- Duplicates
- Reply, commentary and editorial comment;
- Case Reports;
- Techniques description;
- Reviews and meta-analysis ;
- Pediatrics surgery;
- Non matching articles;
- Multinstitutional studies with overlapping data;
- Studies of the same institution with overlapping data;
- Does not provide any outcome of interest;
- Non comparison series;
- Not relevant for the key questions;

**RADICAL
PROSTATECTOMY**
(n=90)

**RADICAL
CYSTECTOMY**
(n=45)

**PARTIAL
NEPHRECTOMY**
(n= 43)

**RADICAL
NEPHRECTOMY**
(n= 3)

RPLND
(n= 0)

Number of Patients

PROSTATECTOMY

Open vs Robotic

▶ **49 846**

(25 204 vs 24 642)

PARTIAL NEPHRECTOMY

Open vs Robotic

▶ **5 462**

(3 306 vs 2 462)

RADICAL CYSTECTOMY

Open vs Robotic

▶ **7 809**

(3 556 vs 4 253)

RADICAL NEPHRECTOMY

Open vs Robotic

▶ **84**

(48 vs 36)

RPLND

Open vs Robotic

▶ **0**

Total : 63 141 patients

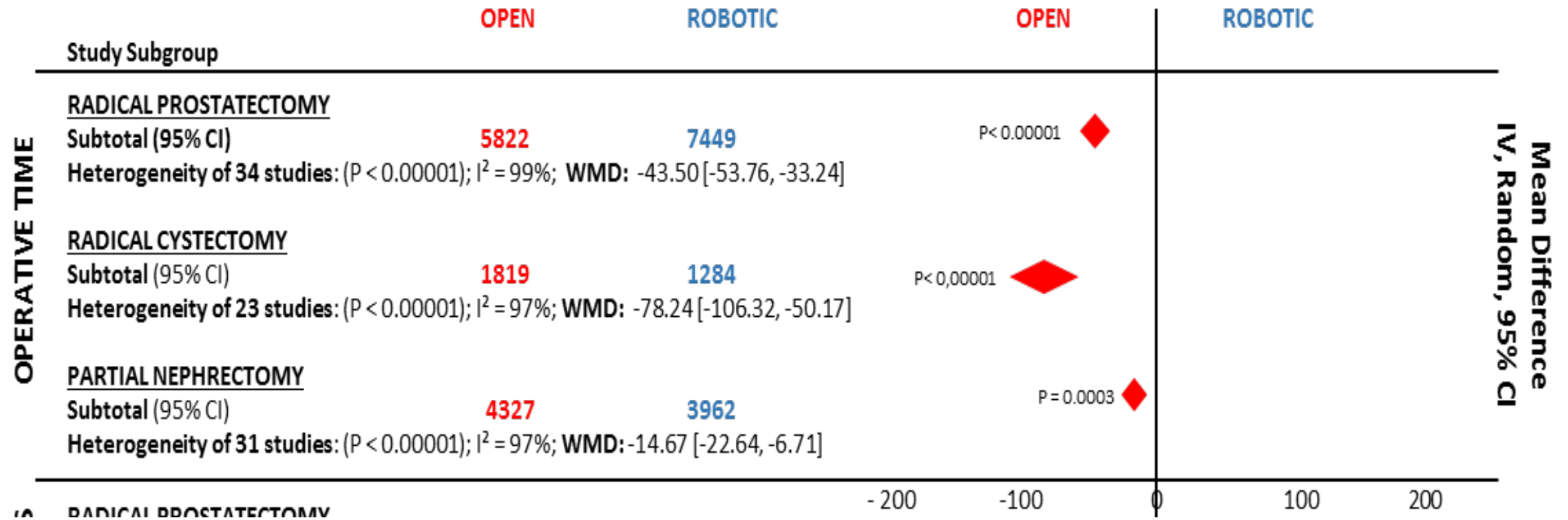
The Statistical Analysis: Meta-analysis OVERVIEW

• Overall comprehensive meta-analysis (no restrictions)		423 forest plots
• Temporal sensitivity meta-analysis Forest plots	(RP < 2008)	135
• Temporal sensitivity meta-analysis Forest plots	(RP > 2008)	135
• Temporal sensitivity meta-analysis Forest plots	(RC < 2011)	135
• Temporal sensitivity meta-analysis Forest plots	(RC > 2011)	135
• Temporal sensitivity meta-analysis Forest plots	(PN < 2014)	135
• Temporal sensitivity meta-analysis Forest plots	(PN > 2014)	135
• Expertise sensitivity meta-analysis	(RP< low volume)	135 Forest plots
• Expertise sensitivity meta-analysis	(RP> high volume)	135 Forest plots
• Expertise sensitivity meta-analysis	(RC< low volume)	135 Forest plots
• Expertise sensitivity meta-analysis	(RC> high volume)	135 Forest plots
• Expertise sensitivity meta-analysis	(PN< low volume)	135 Forest plots
• Expertise sensitivity meta-analysis	(PN> high volume)	135 Forest plots

Total: 2,043 Forest plots

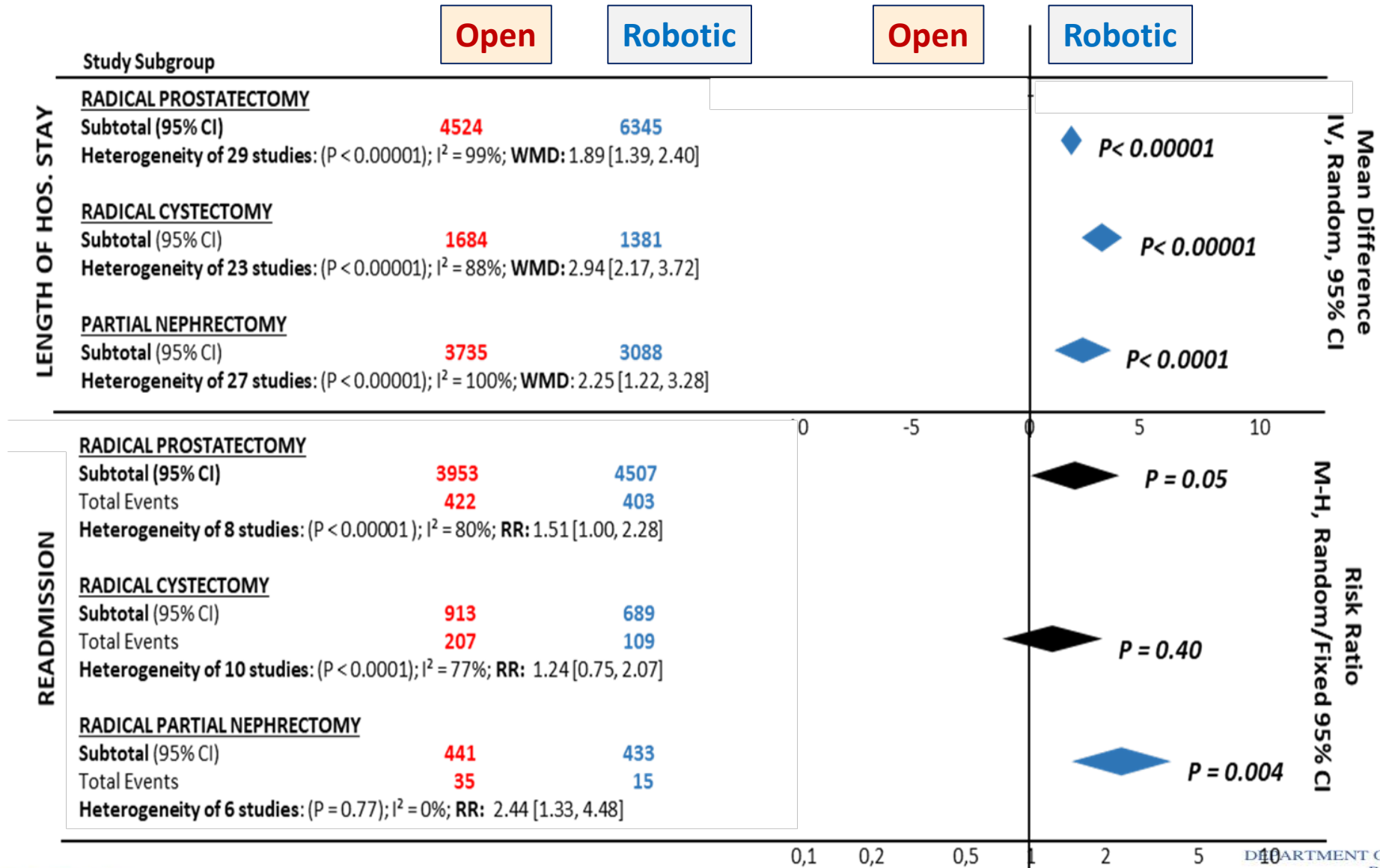


Summary Forest Plot: OPERATIVE TIME



Summary Forest Plot:

LOS; Readmission



Mean Difference
IV, Random, 95% CI

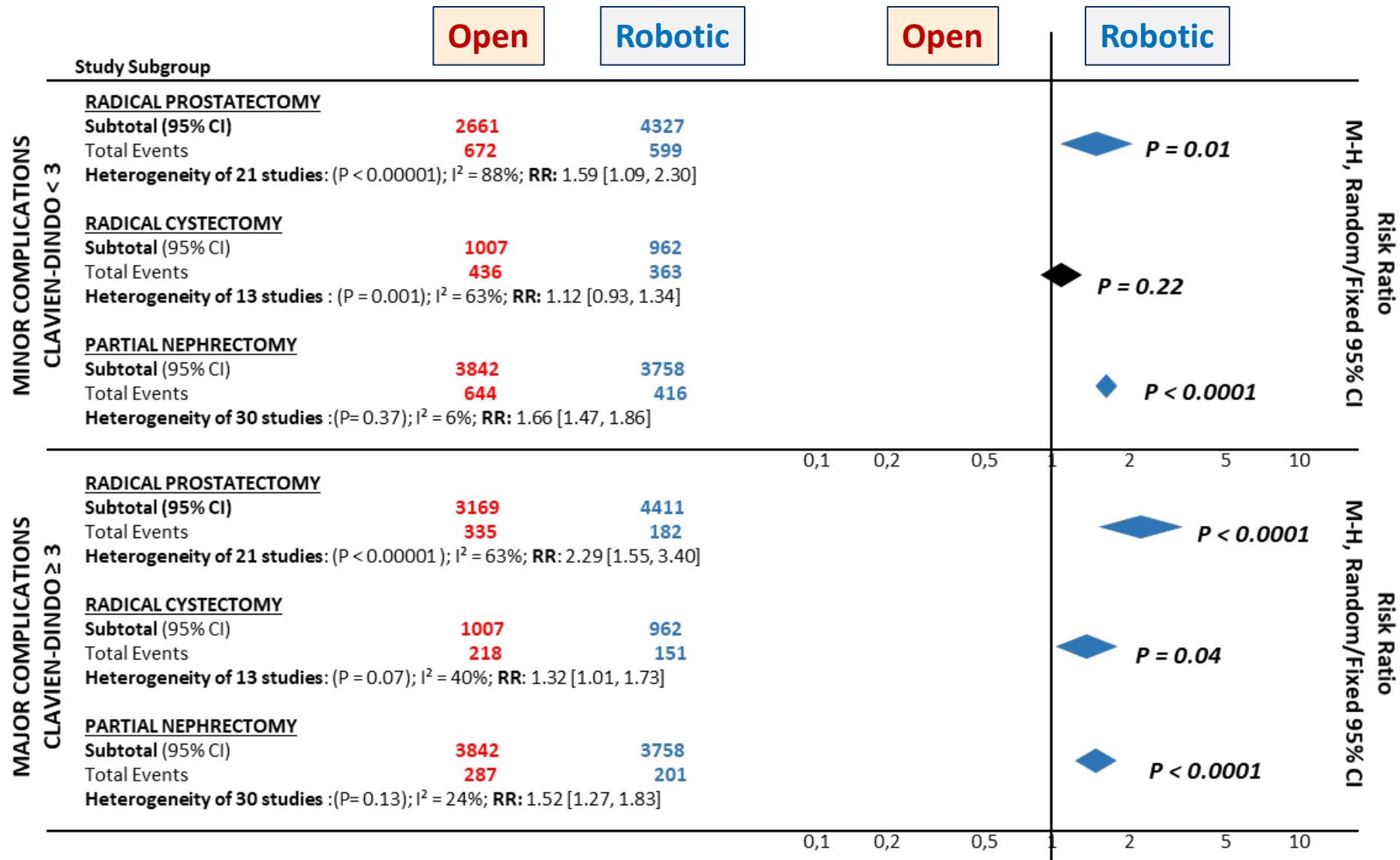
Risk Ratio
M-H, Random/Fixed 95% CI

0,1 0,2 0,5 1 2 5 10



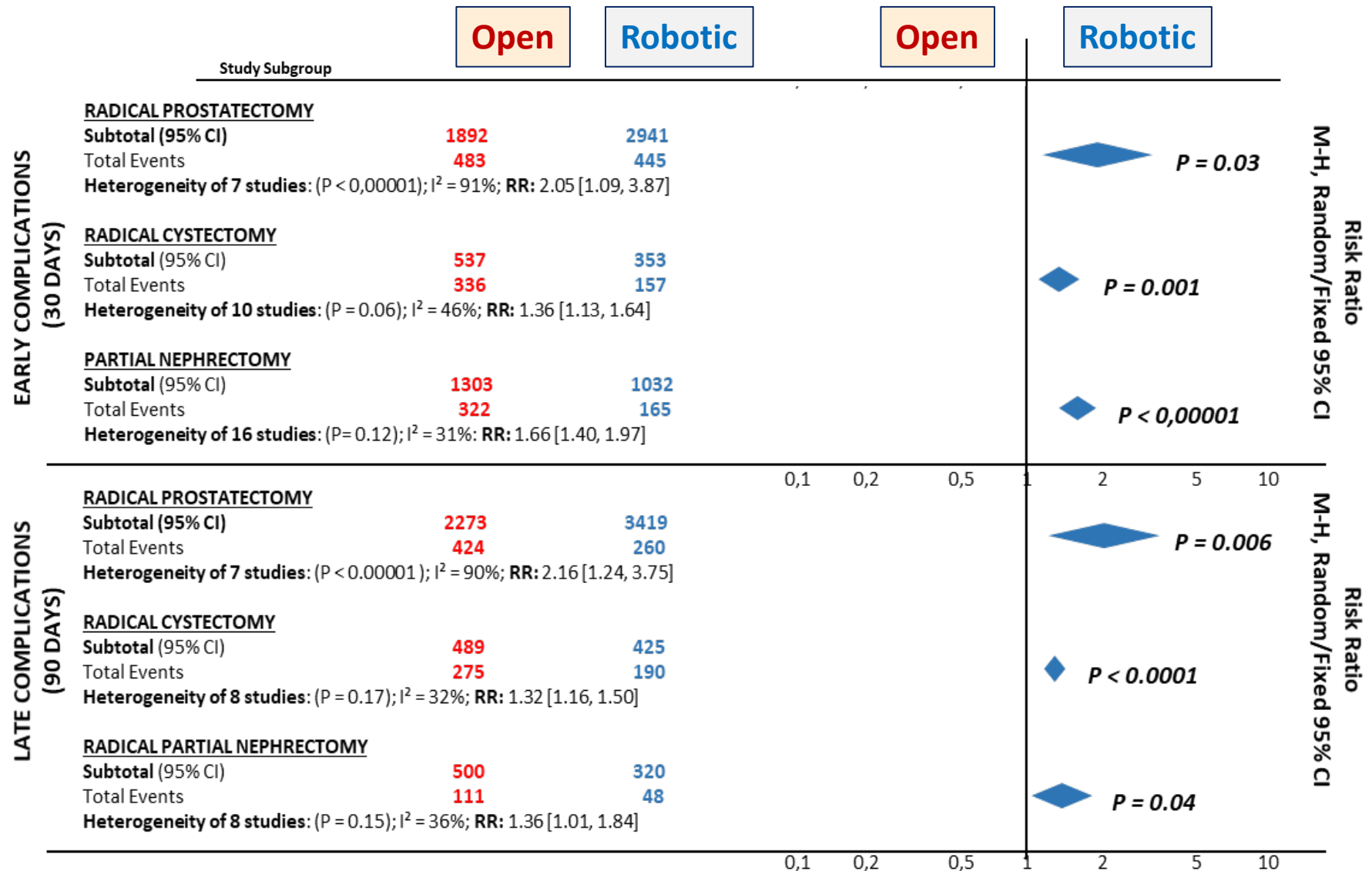
Summary Forest Plot:

Complications (minor/major)

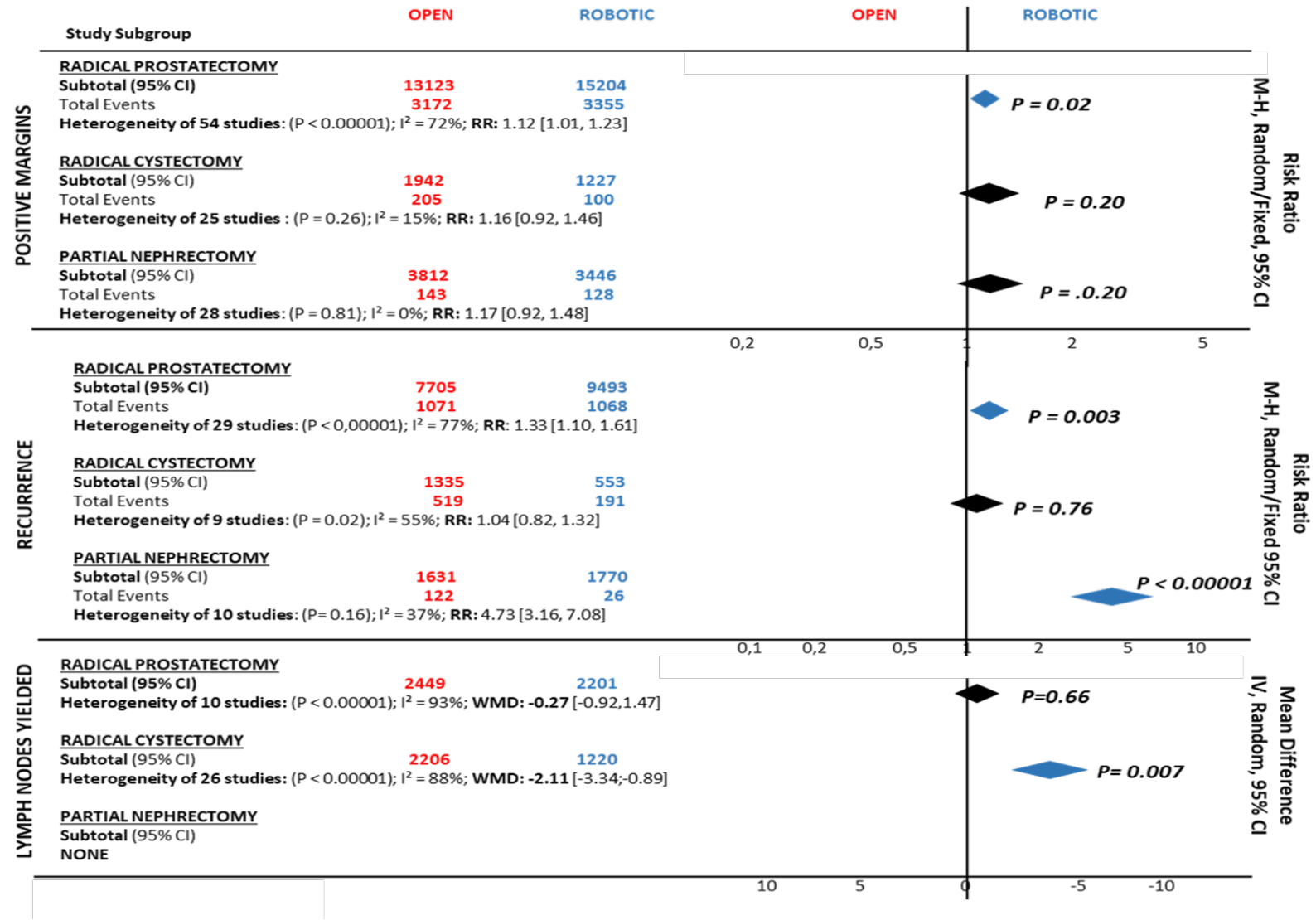


Summary Forest Plot:

Complications (early/late)



SUMMARY PLOT – Positive margins, Recurrence rates, Lymph node yield



Temporal Meta-analysis



Did we improve across the year?
How we improved?

THE TEMPORAL META-ANALYSIS

5 Key Questions (KQs) (Open vs Robotic)

KQ1: Comparative penetrance in the field

KQ2: Peri-operative outcomes

KQ3: Oncologic outcomes & Survival

KQ4: Functional outcomes

KQ5: Financial costs

Temporal meta-analysis

Open vs Robotic Radical Prostatectomy: cut off 2009

Outcome	2000-2009		2010-2017	
	WMD/OR/RR [95%CI]	p value	WMD/OR/RR [95%CI]	p-value
Operative Times	-45.24 [-59.75, -30.72]	< 0.00001	-41.68 [-61.02, -22.35]	< 0.0001
Estimated Blood Loss (EBL)	599.12 [506.95, 691.30]	< 0.00001	340.08 [214.40, 465.76]	< 0.00001
Overall Transfusion Rate	5.76 [3.17, 10.46]	< 0.00001	4.01 [2.06, 7.82]	< 0.0001
Length of Hospital Stays (LOS)	1.85 [1.17, 2.54]	< 0.00001	2.00 [1.07, 2.93]	< 0.00001
Overall Complication	1.31 [0.91, 1.90]	0.15	1.69 [1.17, 2.43]	0.005*
Minor Post-Op Complication	1.55 [0.68, 3.52]	0.3	1.61 [1.05, 2.48]	0.03*
Major Post-Op Complication	1.12 [0.59, 2.12]	0.73	2.68 [1.75, 4.11]	< 0.00001*
Overall Positive Margins	1.20 [0.98, 1.47]	0.08	1.12 [1.00, 1.26]	0.04*
Continence	1.42 [0.94, 2.13]	0.09	1.49 [1.07, 2.10]	0.02*
Potency	1.28 [0.99, 1.66]	0.06	1.15 [1.02, 1.30]	0.03*
Readmission and unscheduled visit	0.86 [0.64, 1.15]	0.31	1.78 [1.08, 2.94]	0.02*
Recurrence	1.13 [0.77, 1.64]	0.54	1.39 [1.11, 1.72]	0.004*
Overall Morality rate	1.31 [0.46, 3.71]	0.34	1.74 [0.76, 3.97]	0.19
Cancer Specific Mortality rate	2.57 [0.11, 62.15]	0.56	-	-

Temporal meta-analysis

Open vs Robotic Radical Prostatectomy: cut off 2009

Outcome	2000-2009		2010-2017	
	WMD/OR/RR [95%CI]	p value	WMD/OR/RR [95%CI]	p-value
Operative Times	-45.24 [-59.75, -30.72]	< 0.00001	-41.68 [-61.02, -22.35]	< 0.0001
Estimated Blood Loss (EBL)	599.12 [506.95, 691.30]	< 0.00001	340.08 [214.40, 465.76]	< 0.00001
Overall Transfusion Rate	5.76 [3.17, 10.46]	< 0.00001	4.01 [2.06, 7.82]	< 0.0001
Length of Hospital Stays (LOS)	1.85 [1.17, 2.54]	< 0.00001	2.00 [1.07, 2.93]	< 0.00001
Overall Complication	1.31 [0.91, 1.90]	0.15	1.69 [1.17, 2.43]	0.005*
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Continence	1.42 [0.94, 2.13]	0.09	1.49 [1.07, 2.10]	0.02*
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Readmission and unscheduled visit	0.86 [0.64, 1.15]	0.31	1.78 [1.08, 2.94]	0.02*
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Cancer Specific Mortality rate	2.57 [0.11, 62.15]	0.56	-	-

Temporal meta-analysis

Open vs Robotic Radical Cystectomy: cut off 2011

Outcome	2006-2011		2012-2017	
	WMD/OR/RR [95%CI]	p value	WMD/OR/RR [95%CI]	p-value
Operative Times	-104.78 [-157.59, -51.96]	0.0001	-68.13 [-100.65, -35.62]	<0.0001
Estimated Blood Loss (EBL)	475.85 [183.48, 768.22]	0.001	555.34 [398.16, 712.51]	<0.0001
Lymphnode yielded	0.80 [-2.64, 4.24]	0.65	-2.47 [-3.79, -1.15]	0.0002*
Transfusion	1.39 [1.01, 1.91]	0.04	3.04 [2.26, 4.08]	<0.00001
Length of Hospital Stays (LOS)	6.15 [3.58, 8.73]	<0.00001	2.50 [1.71, 3.29]	<0.00001
Overall Complication	1.29 [1.08, 1.54]	0.005	1.29 [1.06, 1.56]	0.01
Minor Post-Op Complication	1.02 [0.66, 1.58]	0.93	1.13 [0.93, 1.37]	0.22
Major Post-Op Complication	1.98 [1.16, 3.38]	0.01	1.26 [0.94, 1.68]	0.12
Early Post-Op Complication	1.42 [1.08, 1.88]	0.08	1.36 [1.06, 1.74]	0.01*
Late Post-Op Complication	1.26 [0.96, 1.64]	0.09	1.32 [1.07, 1.63]	0.009*
Positive Margins	1.66 [0.78, 3.55]	0.55	1.13 [0.89, 1.44]	0.3
Readmission and unscheduled visit	1.07 [0.63, 1.83]	0.8	1.25 [0.68, 2.28]	0.47
Recurrence	-	-	1.04 [0.82, 1.32]	0.76
Overall Morality	4.42 [1.21, 16.16]	0.02	1.25 [1.08, 1.44]	0.002
Cancer Specific Mortality	-	-	0.08 [0.03, 0.13]	0.002



Temporal meta-analysis

Open vs Robotic Radical Cystectomy: cut off 2011

Outcome	2006-2011		2012-2017	
	WMD/OR/RR [95%CI]	p value	WMD/OR/RR [95%CI]	p-value
Operative Times	-104.78 [-157.59, -51.96]	0.0001	-68.13 [-100.65, -35.62]	<0.0001
Estimated Blood Loss (EBL)	475.85 [183.48, 768.22]	0.001	555.34 [398.16, 712.51]	<0.0001
Lymphnode yielded	0.80 [-2.64, 4.24]	0.65	-2.47 [-3.79, -1.15]	0.0002*
Transfusion	1.39 [1.01, 1.91]	0.04	3.04 [2.26, 4.08]	<0.00001
Length of Hospital Stays (LOS)	6.15 [3.58, 8.73]	<0.00001	2.50 [1.71, 3.29]	<0.00001
Overall Complication	1.29 [1.08, 1.54]	0.005	1.29 [1.06, 1.56]	0.01
Minor Post-Op Complication	1.02 [0.66, 1.58]	0.93	1.13 [0.93, 1.37]	0.22
Major Post-Op Complication	1.98 [1.16, 3.38]	0.01	1.26 [0.94, 1.68]	0.12
Early Post-Op Complication	1.42 [1.08, 1.88]	0.08	1.36 [1.06, 1.74]	0.01*
Late Post-Op Complication	1.26 [0.96, 1.64]	0.09	1.32 [1.07, 1.63]	0.009*
Positive Margins	1.66 [0.78, 3.55]	0.55	1.13 [0.89, 1.44]	0.3
Readmission and unscheduled visit	1.07 [0.63, 1.83]	0.8	1.25 [0.68, 2.28]	0.47
Recurrence	-	-	1.04 [0.82, 1.32]	0.76
Overall Morality	4.42 [1.21, 16.16]	0.02	1.25 [1.08, 1.44]	0.002
Cancer Specific Mortality	-	-	0.08 [0.03, 0.13]	0.002



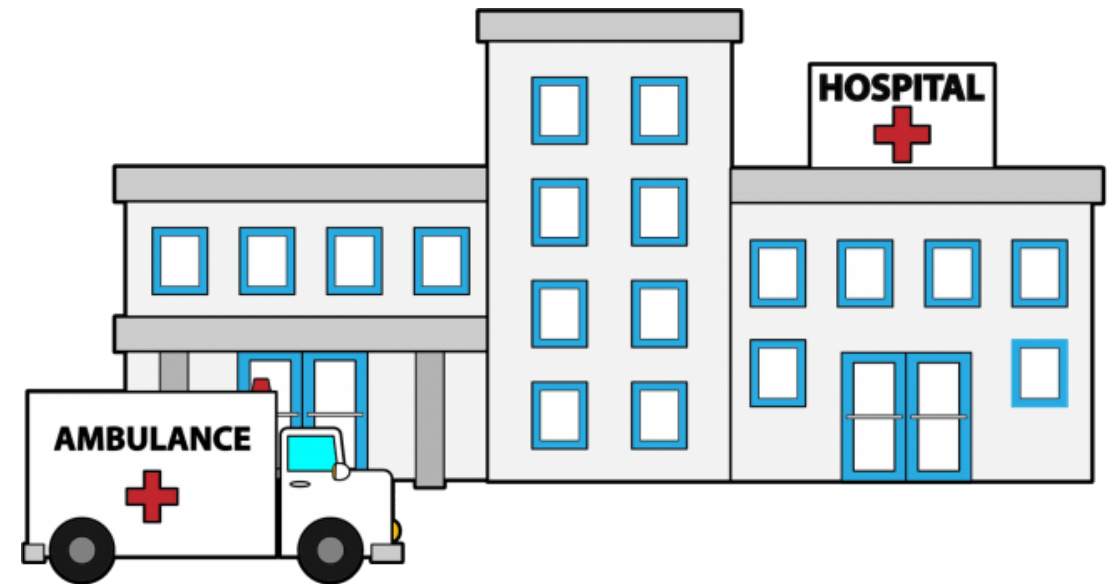
Temporal meta-analysis

Open vs Robotic Partial Nephrectomy : cut off 2013

Outcome	2010-2013		2014-2017	
	WMD/OR/RR [95%CI]	p value	WMD/OR/RR [95%CI]	p-value
Operative Times	-19.17 [-36.31, -2.04]	0.03	-13.52 [-23.08, -3.96]	0.0006
Estimated Blood Loss (EBL)	91.29 [44.33, 138.25]	0.0001	85.08 [62.88, 107.29]	< 0.00001
Transfusions	1.39 [0.92, 2.10]	0.12	1.90 [1.45, 2.47]	< 0.00001*
Length of Hospital Stays (LOS)	3.14 [2.13, 4.15]	< 0.00001	1.78 [0.54, 3.03]	0.0005
Complication rate	1.69 [1.27, 2.26]	0.0004	1.63 [1.48, 1.80]	< 0.00001
Minor Post-Op Complication	1.61 [1.13, 2.28]	0.0008	1.66 [1.47, 1.88]	< 0.00001
Major Post-Op Complication	1.96 [1.04, 3.69]	0.04	1.48 [1.23, 1.79]	< 0.0001
Early Post-Op Complication	2.01 [1.25, 3.24]	0.004	1.59 [1.33, 1.92]	< 0.00001
Late Post-Op Complication	1.27 [0.64, 2.53]	0.49	1.44 [0.84, 2.45]	0.18
Positive Margins	0.89 [0.46, 1.70]	0.72	1.24 [0.96, 1.60]	0.1
Readmission	1.51 [0.34, 6.77]	0.59	2.67 [1.37, 5.21]	0.004*
Recurrence	5.10 [0.27, 96.21]	0.28	2.64 [0.96, 7.27]	0.06
Overall Morality	-	-	4.45 [2.20, 8.98]	< 0.0001
Cancer Specific Mortality	-	-	3.19 [0.64, 15.78]	0.16

Proficiency Meta-analysis

How could we compare
OPEN vs ROBOTIC
in
LOW VOLUME vs HIGH VOLUME?



LOW VOLUME

HIGH VOLUME

Proficiency Meta-analysis

Open vs Robotic Radical Prostatectomy: cut off 50 cases

Outcome	< 50 CASES		> 50 CASES	
	WMD/RR [95%CI]	p-value	WMD/RR [95%CI]	p-value
Operative Times	-41.10 [-73.53, -8.68]	0.01	-54.15 [-65.96, -42.34]	<0.00001
Estimated Blood Loss (EBL)	532.18 [336.18, 728.18]	<0.00001	394.49 [239.06, 549.91]	<0.00001
Transfusion	5.50 [2.12, 14.25]	0.0005	4.80 [3.18, 7.24]	<0.00001
Length of Hospital Stays (LOS)	1.60 [0.60, 2.60]	0.002	1.89 [0.89, 2.89]	0.0002
Overall Complication rate	1.62 [0.76, 3.45]	0.21	1.59 [1.09, 2.31]	0.02*
Minor Post-Op Complication	0.88 [0.57, 1.38]	0.59	2.36 [1.44, 3.87]	0.0007*
Major Post-Op Complication	4.88 [2.10, 11.30]	0.0002	2.29 [1.34, 3.92]	0.0003
Early Post-Op Complication rate	4.75 [2.13, 10.60]	0.0001	1.80 [0.89, 3.62]	0.1*
Late Post-Op Complication	2.08 [0.86, 5.01]	0.1	2.83 [1.81, 4.42]	<0.00001*
Positive Margins	1.17 [0.89, 1.55]	0.26	1.17 [1.01, 1.37]	0.04*
Continence	1.66 [0.80, 3.42]	0.17	1.66 [1.04, 2.65]	0.03
Potency	1.34 [1.01, 1.79]	0.04	1.30 [1.06, 1.60]	0.01
Readmission and unscheduled visit	1.56 [0.66, 3.71]	0.31	1.58 [0.89, 2.80]	0.12
Recurrence	1.15 [0.68, 1.95]	0.6	1.42 [1.01, 1.97]	0.04*
Overall Morality rate	-	-	1.22 [0.55, 2.73]	0.63
Cancer Specific Mortality rate	-	-	2.57 [0.11, 62.15]	0.56

Proficiency Meta-analysis

Open vs Robotic Radical Prostatectomy: cut off 50 cases

Outcome	< 50 CASES		> 50 CASES	
	WMD/RR [95%CI]	p-value	WMD/RR [95%CI]	p-value
Operative Times	-41.10 [-73.53, -8.68]	0.01	-54.15 [-65.96, -42.34]	<0.00001
Estimated Blood Loss (EBL)	532.18 [336.18, 728.18]	<0.00001	394.49 [239.06, 549.91]	<0.00001
Transfusion	5.50 [2.12, 14.25]	0.0005	4.80 [3.18, 7.24]	<0.00001
Length of Hospital Stays (LOS)	1.60 [0.60, 2.60]	0.002	1.89 [0.89, 2.89]	0.0002
Overall Complication rate	1.62 [0.76, 3.45]	0.21	1.59 [1.09, 2.31]	0.02*
Minor Post-Op Complication	0.88 [0.57, 1.38]	0.59	2.36 [1.44, 3.87]	0.0007*
Major Post-Op Complication	4.88 [2.10, 11.30]	0.0002	2.29 [1.34, 3.92]	0.0003
Early Post-Op Complication rate	4.75 [2.13, 10.60]	0.0001	1.80 [0.89, 3.62]	0.1*
Late Post-Op Complication	2.08 [0.86, 5.01]	0.1	2.83 [1.81, 4.42]	<0.00001*
Positive Margins	1.17 [0.89, 1.55]	0.26	1.17 [1.01, 1.37]	0.04*
Continence	1.66 [0.80, 3.42]	0.17	1.66 [1.04, 2.65]	0.03
Potency	1.34 [1.01, 1.79]	0.04	1.30 [1.06, 1.60]	0.01
Readmission and unscheduled visit	1.56 [0.66, 3.71]	0.31	1.58 [0.89, 2.80]	0.12
Recurrence	1.15 [0.68, 1.95]	0.6	1.42 [1.01, 1.97]	0.04*
Overall Morality rate	-	-	1.22 [0.55, 2.73]	0.63
Cancer Specific Mortality rate	-	-	2.57 [0.11, 62.15]	0.56

Proficiency Meta-analysis

Open vs Robotic Radical Cystectomy: cut off 20 cases

Outcome	< 20 CASES		> 20 CASES	
	WMD/RR [95%CI]	p-value	WMD/RR [95%CI]	p-value
Open vs Robotic Radical Cystectomy (cut off 20 cases)				
Operative Times	-63.67 [-96.79, -30.55]	0.0002	-98.55 [-144.01, -53.10]	<0.0001
Estimated Blood Loss (EBL)	538.61 [420.07, 657.14]	<0.00001	477.73 [214.39, 741.07]	0.0004
Transfusion	2.58 [1.67, 3.99]	<0.0001	3.43 [2.01, 5.88]	<0.00001
Length of Hospital Stays	2.20 [-0.24, 4.64]	0.08	2.86 [1.50, 4.21]	<0.0001*
Complication	1.23 [1.07, 1.40]	0.003	1.53 [1.33, 1.77]	<0.00001
Minor Post-Op Complication	1.15 [0.94, 1.41]	0.18	1.16 [0.93, 1.45]	0.19
Major Post-Op Complication	1.47 [1.04, 2.08]	0.03	1.74 [1.29, 2.36]	0.0003
Early Post-Op Complication	1.25 [1.01, 1.55]	0.04	1.86 [1.21, 2.86]	0.005
Late Post-Operative Complication	1.23 [1.03, 1.46]	0.02	1.37 [1.00, 1.88]	0.05
Overall Positive Margins	0.88 [0.59, 1.30]	0.51	1.53 [1.03, 2.28]	0.03*
Readmission and unscheduled visit	1.02 [0.42, 2.49]	0.96	1.06 [0.71, 1.57]	0.78
Recurrence	1.16 [0.87, 1.56]	0.31	1.69 [1.00, 2.84]	0.05
Mortality	1.55 [1.09, 2.20]	0.01	1.64 [1.07, 2.53]	0.02
Cancer Specific Mortality	0.04 [-0.10, 0.18]	0.09	0.08 [-0.00, 0.16]	0.05



Proficiency Meta-analysis

Open vs Robotic Radical Cystectomy: cut off 20 cases

Outcome	< 20 CASES		> 20 CASES	
	WMD/RR [95%CI]	p-value	WMD/RR [95%CI]	p-value
Open vs Robotic Radical Cystectomy (cut off 20 cases)				
Operative Times	-63.67 [-96.79, -30.55]	0.0002	-98.55 [-144.01, -53.10]	<0.0001
Estimated Blood Loss (EBL)	538.61 [420.07, 657.14]	<0.00001	477.73 [214.39, 741.07]	0.0004
Transfusion	2.58 [1.67, 3.99]	<0.0001	3.43 [2.01, 5.88]	<0.00001
Length of Hospital Stays	2.20 [-0.24, 4.64]	0.08	2.86 [1.50, 4.21]	<0.0001*
Complication	1.23 [1.07, 1.40]	0.003	1.53 [1.33, 1.77]	<0.00001
Minor Post-Op Complication	1.15 [0.94, 1.41]	0.18	1.16 [0.93, 1.45]	0.19
Major Post-Op Complication	1.47 [1.04, 2.08]	0.03	1.74 [1.29, 2.36]	0.0003
Early Post-Op Complication	1.25 [1.01, 1.55]	0.04	1.86 [1.21, 2.86]	0.005
Late Post-Operative Complication	1.23 [1.03, 1.46]	0.02	1.37 [1.00, 1.88]	0.05
Overall Positive Margins	0.88 [0.59, 1.30]	0.51	1.53 [1.03, 2.28]	0.03*
Readmission and unscheduled visit	1.02 [0.42, 2.49]	0.96	1.06 [0.71, 1.57]	0.78
Recurrence	1.16 [0.87, 1.56]	0.31	1.69 [1.00, 2.84]	0.05
Mortality	1.55 [1.09, 2.20]	0.01	1.64 [1.07, 2.53]	0.02
Cancer Specific Mortality	0.04 [-0.10, 0.18]	0.09	0.08 [-0.00, 0.16]	0.05

Proficiency Meta-analysis

Open vs Robotic Partial Nephrectomy: cut off 20 cases

Outcome	< 20 cases		> 20 cases	
	WMD/RR [95%CI]	p-value	WMD/RR [95%CI]	p-value
Operative Times	-23.10 [-53.13, 6.94]	<0.00001	-5.65 [-19.79, 8.50]	0.43*
Estimated Blood Loss (EBL)	137.31 [70.89, 203.73]	<0.0001	67.17 [3.50, 130.83]	0.04
Transfusion	0.81 [0.28, 2.34]	0.7	2.02 [1.34, 3.07]	0.0009*
Length of Hospital Stays (LOS)	1.60 [1.12, 2.08]	<0.00001	3.22 [1.91, 4.52]	<0.00001
Overall Complication rate	0.95 [0.68, 1.34]	0.77	1.73 [1.48, 2.02]	<0.00001*
Minor Post-Op Complication	0.90 [0.62, 1.32]	0.59	1.83 [1.51, 2.22]	<0.00001*
Major Post-Op Complication	1.24 [0.47, 3.29]	0.66	1.29 [0.95, 1.75]	0.1
Early Post-Op Complication	0.91 [0.57, 1.44]	0.69	1.73 [1.25, 2.38]	0.0009*
Late Post-Op Complication	0.86 [0.52, 1.44]	0.57	1.45 [0.47, 4.50]	0.52
Positive Margins Rate	0.80 [0.36, 1.80]	0.6	1.03 [0.60, 1.74]	0.93
Readmission and unscheduled visit rate	1.51 [0.34, 6.77]	0.59	1.55 [0.46, 5.21]	0.48
Recurrence	-	-	5.05 [0.61, 41.77]	0.13
Mortality	-	-	-	-
Cancer Specific Mortality	-	-	-	-



Proficiency Meta-analysis

Open vs Robotic Partial Nephrectomy: cut off 20 cases

Outcome	< 20 cases		> 20 cases	
	WMD/RR [95%CI]	p-value	WMD/RR [95%CI]	p-value
Operative Times	-23.10 [-53.13, 6.94]	<0.00001	-5.65 [-19.79, 8.50]	0.43*
Estimated Blood Loss (EBL)	137.31 [70.89, 203.73]	<0.0001	67.17 [3.50, 130.83]	0.04
Transfusion	0.81 [0.28, 2.34]	0.7	2.02 [1.34, 3.07]	0.0009*
Length of Hospital Stays (LOS)	1.60 [1.12, 2.08]	<0.00001	3.22 [1.91, 4.52]	<0.00001
Overall Complication rate	0.95 [0.68, 1.34]	0.77	1.73 [1.48, 2.02]	<0.00001*
Minor Post-Op Complication	0.90 [0.62, 1.32]	0.59	1.83 [1.51, 2.22]	<0.00001*
Major Post-Op Complication	1.24 [0.47, 3.29]	0.66	1.29 [0.95, 1.75]	0.1
Early Post-Op Complication	0.91 [0.57, 1.44]	0.69	1.73 [1.25, 2.38]	0.0009*
Late Post-Op Complication	0.86 [0.52, 1.44]	0.57	1.45 [0.47, 4.50]	0.52
Positive Margins Rate	0.80 [0.36, 1.80]	0.6	1.03 [0.60, 1.74]	0.93
Readmission and unscheduled visit rate	1.51 [0.34, 6.77]	0.59	1.55 [0.46, 5.21]	0.48
Recurrence	-	-	5.05 [0.61, 41.77]	0.13
Mortality	-	-	-	-
Cancer Specific Mortality	-	-	-	-

Temporal meta-analysis

Open vs Robotic Partial Nephrectomy : cut off 2013

Outcome	2010-2013		2014-2017	
	WMD/OR/RR [95%CI]	p value	WMD/OR/RR [95%CI]	p-value
Operative Times	-19.17 [-36.31, -2.04]	0.03	-13.52 [-23.08, -3.96]	0.0006
Estimated Blood Loss (EBL)	91.29 [44.33, 138.25]	0.0001	85.08 [62.88, 107.29]	< 0.00001
Transfusions	1.39 [0.92, 2.10]	0.12	1.90 [1.45, 2.47]	< 0.00001*
Length of Hospital Stays (LOS)	3.14 [2.13, 4.15]	< 0.00001	1.78 [0.54, 3.03]	0.0005
Complication rate	1.69 [1.27, 2.26]	0.0004	1.63 [1.48, 1.80]	< 0.00001
Minor Post-Op Complication	1.61 [1.13, 2.28]	0.0008	1.66 [1.47, 1.88]	< 0.00001
Major Post-Op Complication	1.96 [1.04, 3.69]	0.04	1.48 [1.23, 1.79]	< 0.0001
Early Post-Op Complication	2.01 [1.25, 3.24]	0.004	1.59 [1.33, 1.92]	< 0.00001
Late Post-Op Complication	1.27 [0.64, 2.53]	0.49	1.44 [0.84, 2.45]	0.18
Positive Margins	0.89 [0.46, 1.70]	0.72	1.24 [0.96, 1.60]	0.1
Readmission	1.51 [0.34, 6.77]	0.59	2.67 [1.37, 5.21]	0.004*
Recurrence	5.10 [0.27, 96.21]	0.28	2.64 [0.96, 7.27]	0.06
Overall Morality	-	-	4.45 [2.20, 8.98]	< 0.0001
Cancer Specific Mortality	-	-	3.19 [0.64, 15.78]	0.16

5 Key Questions (KQs) (Open vs Robotic)

KQ1: Comparative penetrance in the field

KQ2: Peri-operative outcomes

KQ3: Oncologic outcomes & Survival

KQ4: Functional outcomes

KQ5: Financial costs

Cost Analysis

Prostate

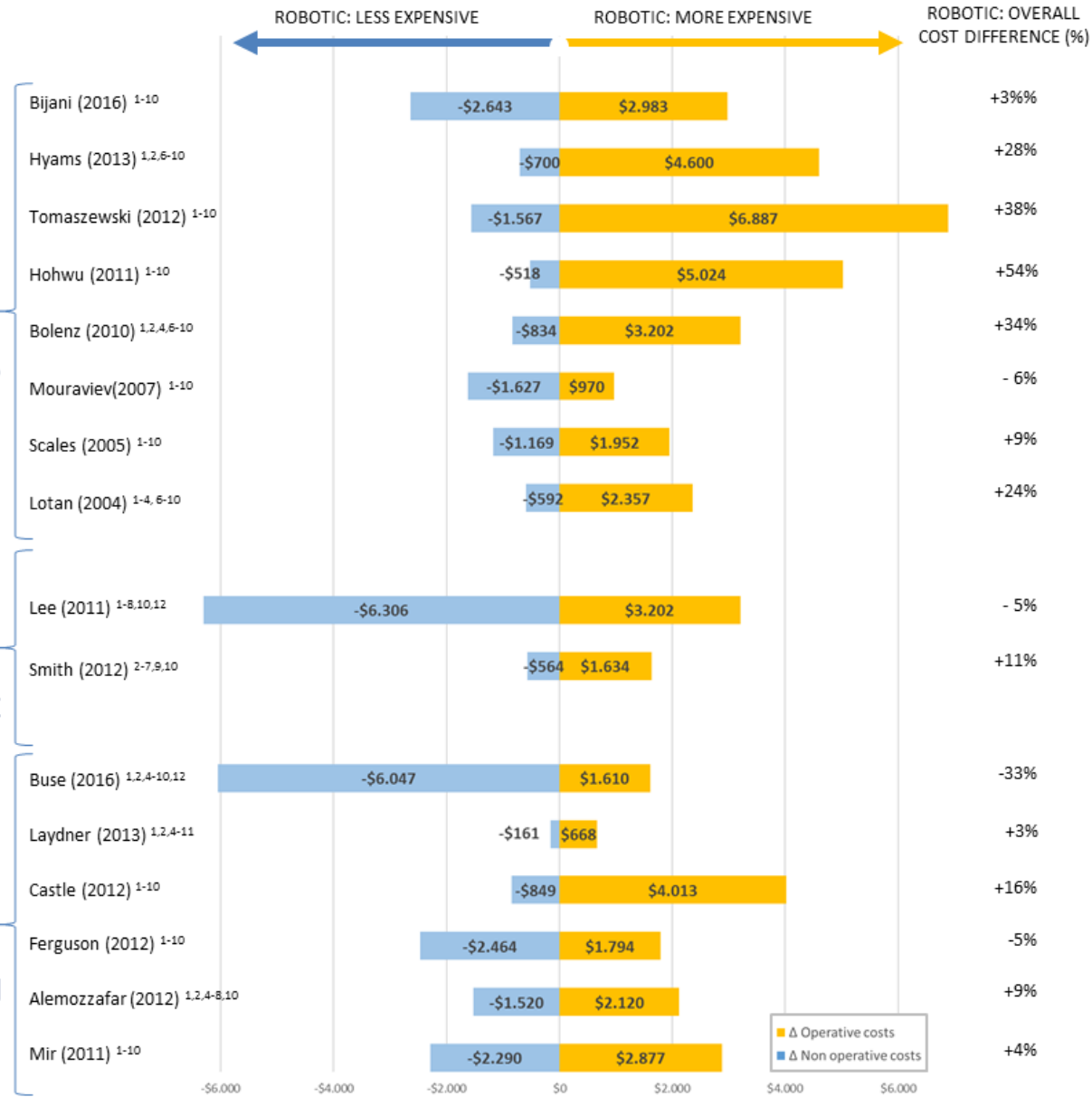
Bladder

Kidney

**RRP
vs
ORP**

**RRC
vs
ORC**

**RPN
vs
OPN**



5 MILIONI LIRE → 3 MILIONI LIRE → 2 MILIONI LIRE → → 100 MILA LIRE → 200 EURO → 100 EURO

Going Mobile | The evolution of the cellphone



1982
Mobira Senator
Finnish company Mobira Oy, a precursor to Nokia, introduced its first car phone, the Mobira Senator NMT-450. It weighed about 22 pounds.



1984
Motorola DynaTac 8000x
The first cellphone to be offered commercially hit the market priced at \$3,995 (\$9,237 in 2012 dollars) and weighed just under 2 pounds.



1987
Mobira Cityman
One of the world's first handheld phones, the Cityman weighed 28 ounces with the battery.



1989
Motorola MicroTac
Initially manufactured as an analog cellphone, the MicroTac was an early example of a flip phone, in which the mouthpiece folded over the keypad.



1992
Nokia 1011
The first digital handheld phone, the Nokia 1011 would become the company's best-selling phone ever.



1993
BellSouth/IBM Simon Personal Communicator
First phone with a touch screen and smartphone features (pager, calculator, address book, send/receive faxes, games and email). Cost about \$900.



2000
Ericsson R380
The first device marketed as a smartphone.



2002
BlackBerry 5810
Made by Research in Motion, the 5810 was a cellphone with organizer functions and a keyboard for thumbs; a wired headset was mandatory.



2004
Motorola RAZR
Was part phone, part fashion accessory. In the RAZR's first four years, Motorola sold more than 110 million units.

Source: WSJ research; Photos: Nokia (3), Motorola (3), BlackBerry, Ericsson, Associated Press



NICE National Institute for
Health and Care Excellence

Issued: January 2014

NICE clinical guideline 175

- 1.3.15 Commissioners of urology services should consider providing robotic surgery to treat localised prostate cancer. **[new 2014]**
- 1.3.16 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. **[new 2014]**

OXFORD Level of Evidence (LOE)

I : 5 (3%)

II : 43 (24%)

III : 64 (35%)

IV : 69 (38%)

OXFORD Level of Evidence (LOE)

I : 5 (3%)

II : 43 (24%)

III : 64 (35%)

IV : 69 (38%)

Oxford Centre for Evidence-based Medicine – Levels of Evidence (2009)

Level	Therapy / Prevention, Aetiology / Harm	Prognosis	Diagnosis
1a	SR (with homogeneity*) of RCTs	SR (with homogeneity*) of inception cohort studies; CDR” validated in different populations	SR (with homogeneity*) of Level 1 diagnostic studies; CDR” with 1b studies from different clinical centres
1b	Individual RCT (with narrow Confidence Interval”i)	Individual inception cohort study with > 80% follow-up;	Validating** cohort study with good” ” ” reference standards;
1c	All or none§	All or none case-series	Absolute SpPins and SnNouts” “
2a	SR (with homogeneity*) of cohort studies	SR (with homogeneity*) of either retrospective cohort studies or untreated control groups in RCTs	SR (with homogeneity*) of Level >2 diagnostic studies
2b	Individual cohort study (including low quality RCT; e.g., <80% follow-up)	Retrospective cohort study or follow-up of untreated control patients in an RCT;	Exploratory** cohort study with good” ” ” reference standards;
2c	“Outcomes” Research; Ecological studies	“Outcomes” Research	
3a	SR (with homogeneity*) of case-control studies		SR (with homogeneity*) of 3b and better studies
3b	Individual Case-Control Study		Non-consecutive study; or without consistently applied reference standards
4	Case-series (poor quality cohort, case-control studies)	Case-series (poor quality prognostic cohort studies)	Case-control study, poor or non-independent reference st
5	Expert opinion without explicit critical appraisal,	Expert opinion without explicit critical appraisal	Expert opinion without explicit critical appraisal



Oxford Centre for Evidence-based Medicine – Levels of Evidence (2009)

Level	Therapy / Prevention, Aetiology / Harm	Prognosis	Diagnosis
1a	SR (with homogeneity*) of RCTs	SR (with homogeneity*) of inception cohort studies; CDR” validated in different populations	SR (with homogeneity*) of Level 1 diagnostic studies; CDR” with 1b studies from different clinical centres
1b	Individual RCT (with narrow Confidence Interval”i)	Individual inception cohort study with > 80% follow-up;	Validating** cohort study with good” ” ” reference standards;
1c	All or none§	All or none case-series	Absolute SpPins and SnNouts” “
2a	SR (with homogeneity*) of cohort studies	SR (with homogeneity*) of either retrospective cohort studies or untreated control groups in RCTs	SR (with homogeneity*) of Level >2 diagnostic studies
2b	Individual cohort study (including low quality RCT; e.g., <80% follow-up)	Retrospective cohort study or follow-up of untreated control patients in an RCT;	Exploratory** cohort study with good” ” ” reference standards;
2c	“Outcomes” Research; Ecological studies	“Outcomes” Research	
3a	SR (with homogeneity*) of case-control studies		SR (with homogeneity*) of 3b and better studies
3b	Individual Case-Control Study		Non-consecutive study; or without consistently applied reference standards
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5	Expert opinion without explicit critical appraisal,	Expert opinion without explicit critical appraisal	Expert opinion without explicit critical appraisal



ROBOTIC SURGERY



We live in the infancy of robotic surgery

**New competing devices are expected
in endourology, laparoscopy and robotics**

More and more technology is going to be introduced in surgery

**CONNECTIVITY
MACHINE LEARNING
ARTIFICIAL INTELLIGENCE
BIG DATA
NANOTECHNOLOGY**





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