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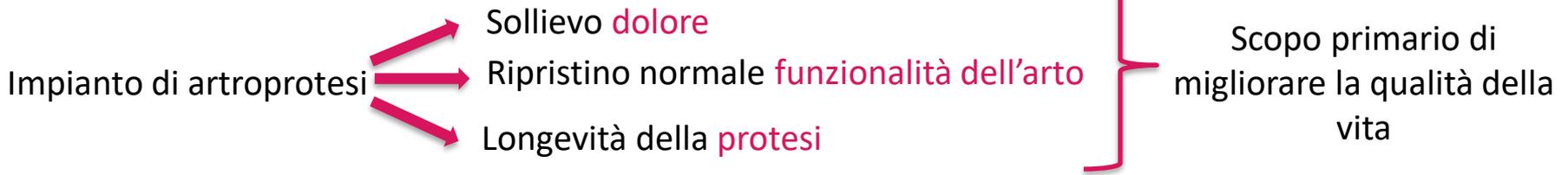
*SIMPOSIO SIOT/RIAP/GLOBE – EVIDENZE SCIENTIFICHE IN CHIRURGIA ROBOTICA: RCT vs REGISTRI*

# Registri protesici: dati internazionali sulla Robotica

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# Registri protesici: dati internazionali sulla Robotica



Utilizzo della **chirurgia robotica**

**Australia** domina la scena mondiale [1].

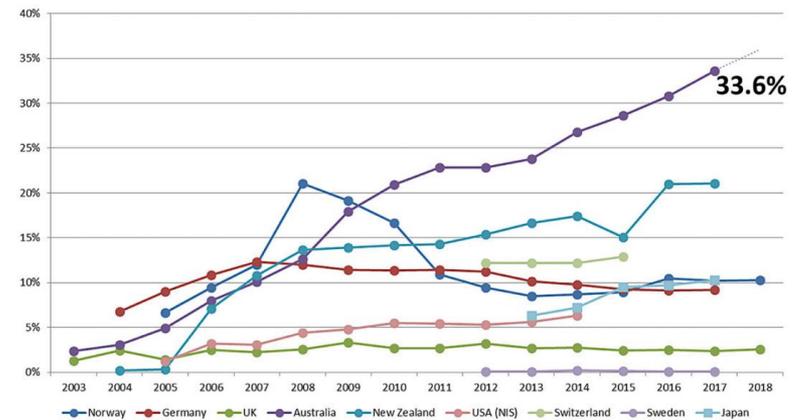


Fig. 1  
The percent of arthroplasties performed using computer navigation from 2003 to 2018 (as per each country's national joint registry annual report). NIS = National Inpatient Sample. (Reproduced, with permission of Dr. Martin A. Bauer, from Brainlab AG.)

[1] Hazratwala, K., Brereton, S. G., Grant, A., & Dlaska, C. E. (2020). Computer-Assisted Technologies in Arthroplasty: Navigating Your Way Today. *JBJS reviews*, 8(3), e0157. <https://doi.org/10.2106/JBJS.RVW.19.00157>

## Risultati [2]

### US

| utilizzo            | 2005 | 2014 |
|---------------------|------|------|
| Computer navigation | 1.2% | 6.3% |
| technology assisted | 1.2% | 7%   |

### Registro Novergese

| Follow up (8 anni) | CAS  | CONV |
|--------------------|------|------|
|                    | 5.1% | 4.2% |
| <65                | 6.4% | 7.3% |

### Registro Neozelandese

| Tasso di revisione | CAS  | CONV |
|--------------------|------|------|
| <65 (5 anni)       | 3%   | 2.9% |
| <65 (10 anni)      | 4.4% | 4.9% |

| Registro Neozelandese | N°     | CAS    | CONV |
|-----------------------|--------|--------|------|
| TKA                   | 20.000 | 10.404 | 8817 |

### Registro Australiano

| utilizzo | 2002 | 2018 |
|----------|------|------|
| TKA      | 2.4% | 33%  |

|                      |         |
|----------------------|---------|
| n° TKA (report 2019) | 132.211 |
|----------------------|---------|

| Tasso revisione (3 anni) | non robotic | robotic |
|--------------------------|-------------|---------|
| UKR                      | 4.6%        | 2.8%    |

| Tasso revisione (10 anni) | CAS  | CONV |
|---------------------------|------|------|
| <65                       | 6.9% | 7.8% |

| Tasso revisione (15 anni) | CAS   | CONV |
|---------------------------|-------|------|
| TKA                       | 7.1%  | 7.4% |
| TKA >65                   | 5.4%  | 5.2% |
| TKA <65                   | 11.2% | 9.7% |

L'accuratezza della chirurgia robotica rispetto al metodo tradizionale non è ancora dimostrata. C'è necessità di effettuare studi di **coorte su larga scala** che abbiano il giusto potere di dimostrare questa differenza. Per questo, i **registri nazionali di artroprotesi** possono giocare un ruolo fondamentale.

[2] J. Shatrov, D. Parker «Computer and robotic- assisted total knee arthroplasty: a review of outcomes», Journal of Experimental Orthopaedics, (2020) 7:70

## Dati da Report

Variables, response rate 2016–2020

Svezia

|                     | 2016 | 2017 | 2018 | 2019 | 2020 |
|---------------------|------|------|------|------|------|
| Navigation (CAS), % | 100  | 100  | 100  | 100  | 100  |

## Computernavigation

Table 32: Primary operations - Total knee prostheses

| Year    | Yes       | No          | Missing   | Total |
|---------|-----------|-------------|-----------|-------|
| 2020    | 480 (8%)  | 4 779 (84%) | 412 (7%)  | 5 671 |
| 2019    | 514 (8%)  | 5 203 (85%) | 433 (7%)  | 6 150 |
| 2018    | 597 (10%) | 4 785 (82%) | 449 (8%)  | 5 831 |
| 2017    | 569 (10%) | 4 515 (81%) | 516 (9%)  | 5 600 |
| 2016    | 584 (11%) | 4 413 (80%) | 553 (10%) | 5 550 |
| 2015    | 475 (9%)  | 4 167 (79%) | 652 (12%) | 5 294 |
| 2014    | 443 (9%)  | 3 883 (78%) | 648 (13%) | 4 974 |
| 2013    | 390 (9%)  | 3 404 (75%) | 723 (16%) | 4 517 |
| 2012    | 416 (9%)  | 3 292 (75%) | 682 (16%) | 4 390 |
| 2011    | 445 (11%) | 3 170 (78%) | 447 (11%) | 4 062 |
| 2010    | 659 (17%) | 3 101 (79%) | 185 (5%)  | 3 945 |
| 2009    | 762 (19%) | 3 064 (77%) | 160 (4%)  | 3 986 |
| 2008    | 742 (21%) | 2 640 (75%) | 144 (4%)  | 3 526 |
| 2005-07 | 813 (9%)  | 7 278 (85%) | 500 (6%)  | 8 591 |

Table 33: Primary operations - Unicondylar knee prostheses

| Year    | Yes     | No          | Missing  | Total |
|---------|---------|-------------|----------|-------|
| 2020    | 2 (0%)  | 801 (97%)   | 26 (3%)  | 829   |
| 2019    | 0       | 920 (93%)   | 64 (7%)  | 984   |
| 2018    | 1 (0%)  | 961 (96%)   | 38 (4%)  | 1 000 |
| 2017    | 0       | 810 (93%)   | 58 (7%)  | 868   |
| 2016    | 0       | 800 (93%)   | 63 (7%)  | 863   |
| 2015    | 4 (1%)  | 681 (90%)   | 68 (9%)  | 753   |
| 2014    | 0       | 519 (86%)   | 87 (14%) | 606   |
| 2013    | 0       | 389 (82%)   | 88 (18%) | 477   |
| 2012    | 0       | 419 (88%)   | 56 (12%) | 475   |
| 2011    | 1 (0%)  | 387 (88%)   | 51 (12%) | 439   |
| 2010    | 7 (2%)  | 394 (95%)   | 13 (3%)  | 414   |
| 2009    | 3 (1%)  | 452 (98%)   | 8 (2%)   | 463   |
| 2008    | 15 (3%) | 416 (95%)   | 9 (2%)   | 440   |
| 2005-07 | 21 (2%) | 1 231 (93%) | 69 (5%)  | 1 321 |

Registration of CAOS started in 2005

Norvegia

## Dati da Report

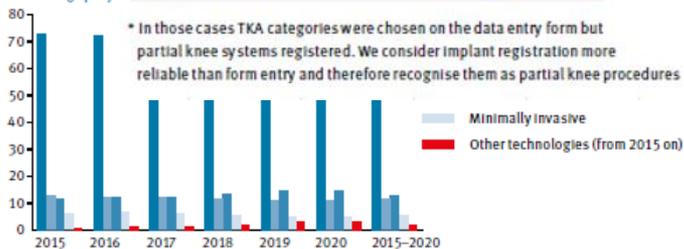
### Svizzera

Table 6.7  
Primary total knee arthroplasty: Technologies used

All diagnoses, Multiple

| Technology          | N (2015-2020)                    | N      | %    |
|---------------------|----------------------------------|--------|------|
| Conventional        | Conventional                     | 11,131 | 68.8 |
| Computer/navigation | Minimally invasive               | 3,943  | 24.4 |
| PSI                 | Patient specific instrumentation | 790    | 4.9  |
| Minimally invasive  | Computer assisted                | 319    | 2.0  |
| Other technologies  | Other                            | 361    | 2.2  |

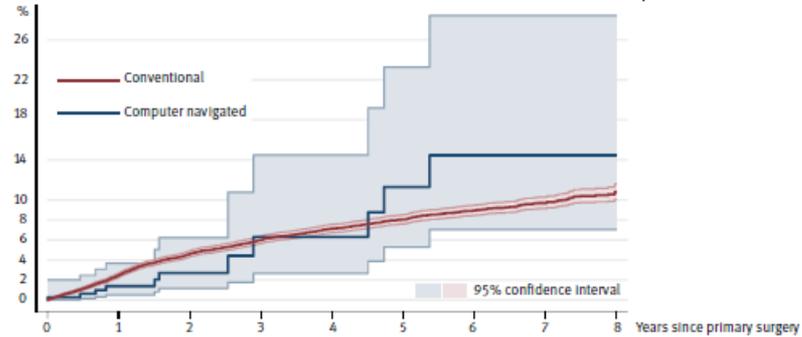
Figure 6.5  
Primary total knee arthroplasty: Percentage per year



|      |
|------|
| 20   |
| 15,3 |
| 70   |
| 10   |
| 14   |
| 5    |
| ...  |

Table 6.4  
Primary total knee arthroplasty: Surgery characteristics all diagnoses

Figure 7.6  
Estimated failure rates of primary partial knee arthroplasty: conventional vs. computer navigated



| Cumulative rev. rates | 1 year        | 2 years       | 3 years        | 4 years        | 5 years         | 6 years         | 7 years         | 8 years          |
|-----------------------|---------------|---------------|----------------|----------------|-----------------|-----------------|-----------------|------------------|
| Conventional          | 2.5 (2.3-2.7) | 4.6 (4.3-4.9) | 6.0 (5.6-6.3)  | 7.1 (6.7-7.6)  | 8.1 (7.6-8.5)   | 8.9 (8.4-9.5)   | 9.7 (9.1-10.3)  | 10.8 (10.1-11.6) |
| Computer nav.         | 1.4 (0.5-3.7) | 2.7 (1.2-6.2) | 6.3 (2.7-14.5) | 6.3 (2.7-14.5) | 11.3 (5.3-23.3) | 14.5 (7.0-28.4) | 14.5 (7.0-28.4) |                  |

|                                  |     |     |
|----------------------------------|-----|-----|
| Patient specific instrumentation | 84  | 0.8 |
| Minimally invasive               | 273 | 2.6 |
| Other                            | 94  | 0.9 |

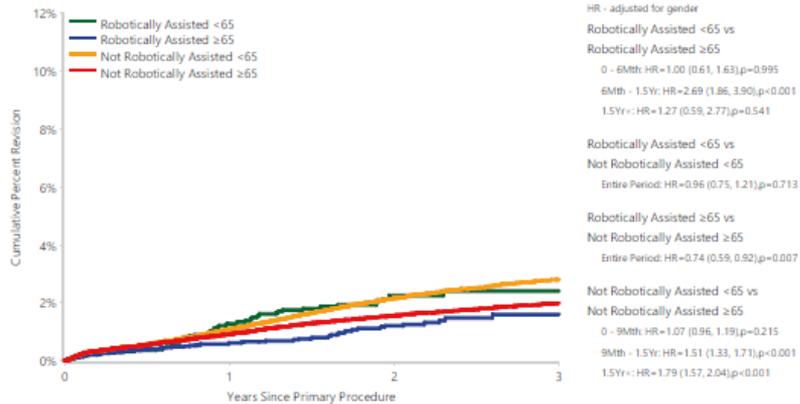
\* Includes a small proportion of reoperations that are not counted as component revisions in the evaluative parts of this report

\*\* Entered as „other“ intervention and then recoded. As of form version 2021, SIRIS lists Medial Pivot as a separate main category

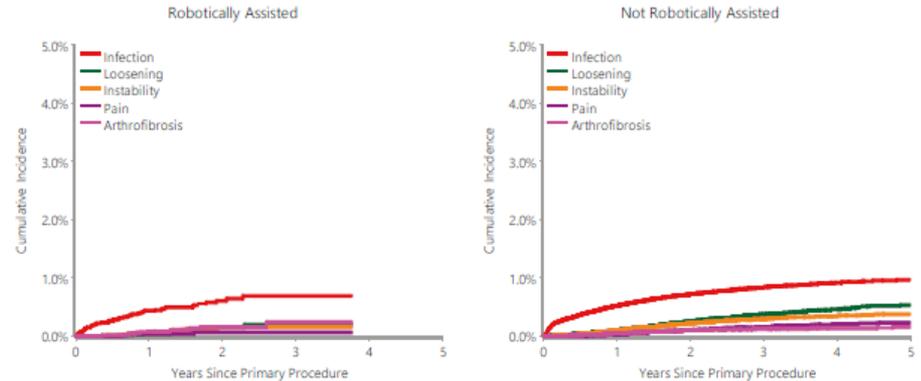
# Dati da Report

## Australia

**Figure KT55 Cumulative Percent Revision of Primary Total Knee Replacement Since 2017 by Robotic Assistance and Age (Primary Diagnosis OA)**



**Figure KT54 Cumulative Incidence Revision Diagnosis of Primary Total Knee Replacement Since 2017 by Robotic Assistance (Primary Diagnosis OA)**

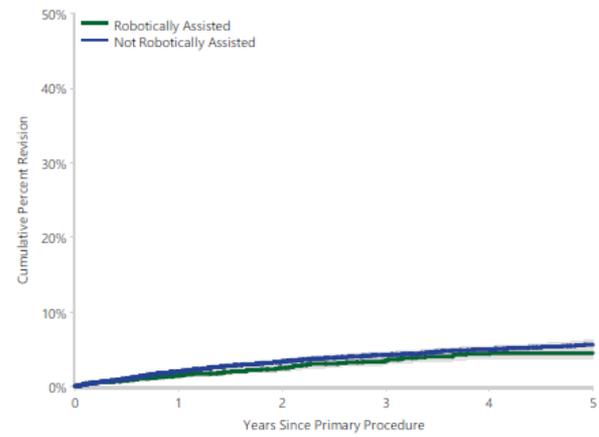


Note: Restricted to modern prostheses

# Dati da Report

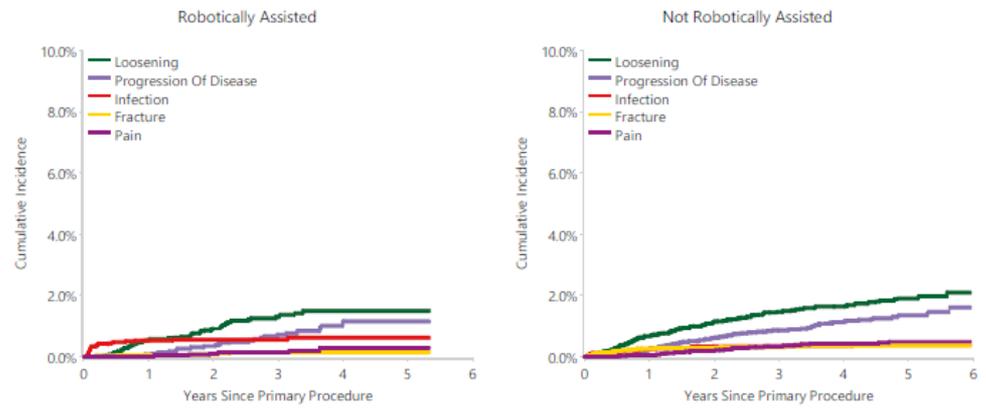
## Australia

Figure KP10 Cumulative Percent Revision of Primary Unicompartamental Knee Replacement since 2015 by Robotic Assistance (Primary Diagnosis OA)



HR - adjusted for age and gender  
 Not Robotically Assisted vs  
 Robotically Assisted  
 Entire Period: HR=1.23 (1.03, 1.48), p=0.025

Figure KP11 Cumulative Incidence Revision Diagnosis of Primary Unicompartamental Knee Replacement Since 2015 by Robotic Assistance (Primary Diagnosis OA)



Note: Restricted to modern prostheses

# Conclusioni

- Australia domina la scena internazionale (33.6%)
- Più diffusa la chirurgia robotica per le protesi totali di ginocchio
- Nei report annuali non è sempre presente
- Difficoltà nel reperire le informazioni

# Grazie dell'attenzione!

Il lavoro è stato realizzato nell'ambito del Registro Italiano ArtoProtesi (RIAP) e del Registro Italiano delle Protesi Impiantabili (RIPI) coordinati dall'Istituto Superiore di Sanità e realizzati grazie al contributo assicurato dal Ministero della Salute, Direzione Generale dei Dispositivi Medici e del Servizio Farmaceutico