Lo SCALPELLO Journal (2022) 36:75-77
doi number: 10.36149/0390-5276-255

Implementation of data collection for the Italian Arthroplasty Registry. Learning curve of 5 surgical centers

Alessio Tarantino[1], Emilio Romanini[1,2], Raffaele Cioffi[1], Francesca Silleni[1], Luigi Valentino[1], Pierpaolo Scarnera[1], Andrea Fidanza[1], Marina Torre[3], Enrico Ciminello[3], Giandomenico Logroscino[1], Vittorio Calvisi[1]

[1] Department Life, Health and Environmental sciences, Unit of Orthopaedic & Trauma, University of L'Aquila, L'Aquila, Italy; [2] Center for Hip and Knee Arthroplasty, Polo Sanitario San Feliciano, Rome, Italy; [3] Scientific Secretariat of the Presidency, Italian National Institute of Health, Rome, Italy

Summary

Introduction. Arthroplasty registries are widely recognized as an effective tool, providing a constant flow of data that can guide the clinical practice of orthopedic surgeons. Despite their usefulness, their implementation in Italy has historically proved to be laborious. In fact, many surgeons are unwilling to participate, claiming as reason for this inertia the additional work needed in an already overloaded clinical practice.
Material and methods. Five operators from five different hospitals without any previous experience with arthroplasty registries entered all the data relevant to the joint replacements performed in their structures in a dedicated online platform and measured the time needed for any input. The learning curve for each operator was then drawn.
Results. After the input of 20 procedures, all operators reached a plateau of about 2-3 minutes to record a single intervention.
Conclusions. The modest amount of time required to compile registry data sheet should not represent a limitation for surgeons to enter the information into a national registry.

Key words: registry, arthroplasty, knee arthroplasty, hip arthroplasty, RIAP

Received: April 25, 2022
Accepted: September 12, 2022

Correspondence
Alessio Tarantino
Department Life, Health and Environmental Sciences (MeSVA), University of L'Aquila, piazzale S. Tommasi 1, 67100 L'Aquila, Italy
E-mail: alessio.tarantino1984@gmail.it

How to cite this article: Tarantino A, Romanini E, Cioffi R, et al. Implementation of data collection for the Italian Arthroplasty Registry. Learning curve of 5 surgical centers. Lo Scalpello Journal 2022;36:75-77. https://doi.org/10.36149/0390-5276-255

List of abbreviations

EBM: evidence-based medicine
TKA: total knee arthroplasty
THA: total hip arthroplasty
RIAP: Registro Italiano ArtroProtesi

Introduction

Joint registries have played an important role in the development of hip and knee arthroplasty and are now widespread in the international orthopedic world [1]. Swe-

den was the leader in the organization of reliable joint registries, starting an organic data collection process in the 1970s. Registries were initially conceived as a tool to guide the surgeon in choosing the implant in an era in which the number of procedures performed was low and limited to a few highly specialized centers. Since then, registries quickly turned into an invaluable source of clinical data and a milestone for evidence-based medicine (EBM) [2], guiding therapeutic choices [3] and strategies [4], and encouraging the start of national registries in many countries (Finland, Norway, Denmark, New Zealand, Australia, United Kingdom) [5,6]. Registries are also widely used to perform prospective assessments for medium- and long-term health planning strategies. In Italy, some registries were started on a voluntary initiative of individual regions [7]. However, in 2005 Orthopedic surgeon community launched a project to collect and organize data from individual regions that led to the establishment of a national registry (Registro Italiano ArtroProtesi, RIAP), producing a single annual report since 2015. Considerable progress has been made since the start of the RIAP project, even if full coverage and completeness of data collection from the entire nation is still far from reality. The reasons for this delay are manifold: while surgeons complain of work overload due to the input of data, the constant changes in the bodies in charge also slowed down the implementation of a standardized methodology and the consolidation of adequate know-how. Furthermore, the lack of incentives renders hospitals little interested in collaborating voluntarily. Some regions have introduced reimbursement schemes linked to the entry of registry data, rapidly achieving remarkable completeness percentages [8]. The issue of overwork for surgeons is a more complex topic. It is undeniable that in many Italian structures the chronic lack of staff makes it difficult to fulfill normal bureaucratic obligations. However, in a previous study we demonstrated that after a fast learning curve less than 3 minutes are necessary to enter data for a primary case [9]. It is undeniable that in many Italian structures the chronic lack of doctors makes it difficult to fulfill normal bureaucratic obligations. In this study we standardized the data collection procedure to quantify the learning curve of different operators in different orthopaedic centers timing the data imputing for the first 100 cases (50 hips and 50 knees arthroplasties).

Materials and methods

Data for a total of 500 primary and revision procedures were collected retrospectively by 5 different operators in 5 different facilities linked to the Orthopedic Residency program of the University of L'Aquila in Italy for a total of 50 total hip arthroplasties (THA) and 50 total knee arthroplasties (TKA) for each operator. None of the operators had any previous experience in registry data collection. Time of input for every data collecting timing was measured and the learning curve of each operator was drawn. Both election and trauma cases were included. The time needed for each input was measured and the learning curve of each operator was drawn.

Results

The data proved to be highly homogeneous, with the learning curves of four of five structures basically superimposable. The learning curve showed a plateau after about 20 cases by all operators, with a reduction of the initial entry times ranging between 25 and 40%. Average entry time for all the procedures was around 2.5 minutes. There were no significant differences in the entry times between primary THA (Fig. 1) and TKA (Fig. 2), but revision cases required an additional 45% to 61% time compared to primary cases. Just a single operator took on average 40% longer.

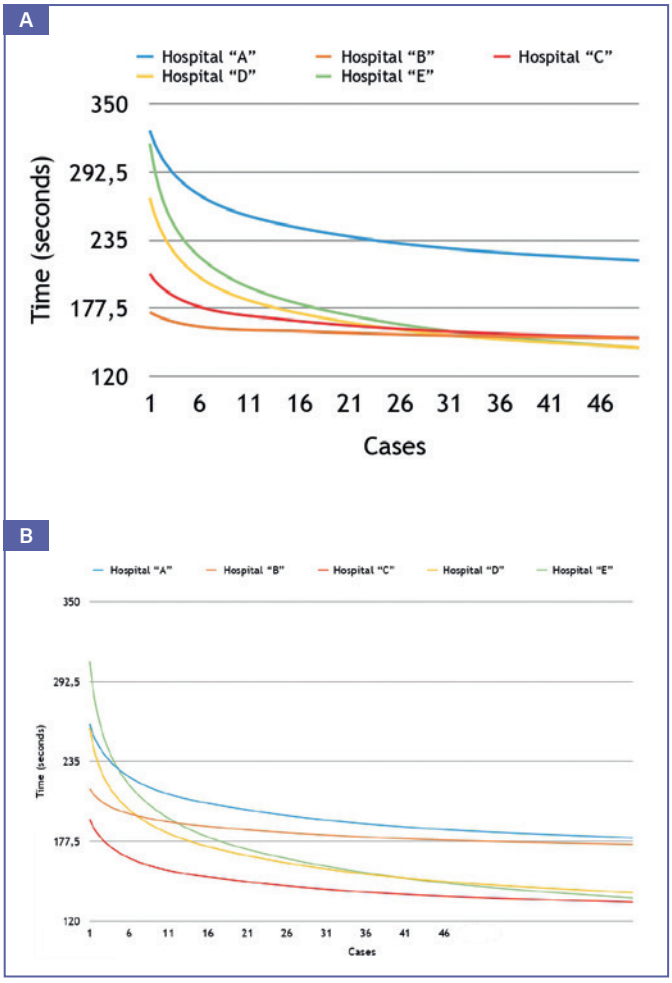

Figure 1. Flowcharts of primary THA (a) and TKA (b) show a plateau after about 20 cases with a substantial reduction of entry times to collect data according to the RIAP protocol.

Discussion

Our study clearly showed that, to successfully enter in the registry the data relating to a single case, about 2.5 minutes of additional work are required in standardized settings after a negligible learning curve. It has to be highlighted that, initially, none of the residents were familiar with either the RIAP or the data entry program. Among the five operators considered, the results produced by four are substantially superimposable. Only one operator showed entry times about 40% higher than the others. This is probably because he had to manually enter the codes of some components not yet available in the device database integrated in the RaDaR platform (and to signal to RIAP that they are missing), or had to register a higher number of devices, as happens for revision procedures. In fact, data entry time increases in a directly proportional way with the number of components to be registered. However, it is important to highlight that the time spent to signal to RIAP a missing device is capitalized for the subsequent registrations. Thanks to these inputs, the process managed by RIAP that continuously update the device database has allowed in a few years to increase its compliance to more than 90% of all the product codes contained within the registry [10]. Leaving the discussion on incentives and deterrents for registry to be treated elsewhere, based on our results we believe that the requested additional time does not justify the low participation in data collection and that the possibility of contributing to a data source of such reliability should represent a sufficient incentive for all surgeons dedicated to arthroplasty.

Conclusions

The strengthening and enrichment of RIAP with high level of coverage and completeness represents a need that cannot be further delayed for the Italian Orthopedic community. The small amount of extra resources needed for the collection of a solid know-how and the very rapid learning curve of an operator do not justify the inertia of many among surgeons and healthcare facilities. Therefore, to reach high levels of coverage and completeness, it is essential to introduce an appropriate system of incentives to sensitize surgeons to the use of RIAP. Moreover, further multicenter and case studies are also needed to verify any discrepancies in the learning curves for other joints not considered in this study.

Acknowledgements
This study was performed within the framework of the Italian Arthroplasty Registry coordinated by the Italian National Institute of Health (ISS) and supported by the Medical Devices and Pharmaceutical Service General Directorate of the Italian Ministry of Health.

Availability of data and materials
The datasets used and analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest statement
The Authors declare that they have no conflict of interest.

Funding
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' contributions
AT, ER, VC: designed the studio; AT, RC, FS, LV, PS: selected the patients and collected the data; AF, GL: verified the analytical methods and supervised the findings of this work; M: Torre coordinated the study for RIAP, interpretation of data and manuscript preparation; EC: provided data analysis and interpretation, manuscript preparation. All Authors provided critical feedback and helped shape the research, analysis and manuscript. All Authors have read and approved the manuscript.

Ethical consideration
This article does not contain any studies with human participants or animals performed by any of the Authors.

References
1 Malchau H, Garellick G, Berry D, et al. Arthroplasty implant registries over the past five decades: development, current, and future impact. J Orthop Res 2018;36:2319-2330. https://doi.org/10.1002/jor.24014
2 Hughes RE, Zheng H, Igrisan RM, et al. The Michigan Arthroplasty Registry collaborative quality initiative experience: improving the quality of care in Michigan. J Bone Joint Surg Am 2018;100:e143. https://doi.org/10.2106/JBJS.18.00239
3 Markel DC, Allen MW, Zappa NM. Can an Arthroplasty Registry help decrease transfusions in primary total joint replacement? A quality initiative. Clin Orthop Relat Res 2016;474:126-131. https://doi.org/10.1007/s11999-015-4470-z. Erratum in: Clin Orthop Relat Res 2016;474:279.
4 Patel A, Pavlou G, Mújica-Mota RE, et al. The epidemiology of revision total knee and hip arthroplasty in England and Wales: a comparative analysis with projections for the United States. A study using the National Joint Registry dataset. Bone Joint J 2015;97-B:1076-1081. https://doi.org/10.1302/0301-620X.97B8.35170
5 Delaunay C. Registries in orthopaedics. Orthop Traumatol Surg Res 2015;101(Suppl 1):S69-S75. https://doi.org/10.1016/j.otsr.2014.06.029
6 Lübbeke A, Silman AJ, Barea C, et al. Mapping existing hip and knee replacement registries in Europe. Health Policy 2018;122:548-557. https://doi.org/10.1016/j.healthpol.2018.03.010.
7 Stea S, Bordini B, De Clerico M, et al. First hip arthroplasty register in Italy: 55,000 cases and 7 year follow-up. Int Orthop 2009;33:339-346. https://doi.org/10.1007/s00264-007-0465-z
8 Torre M, Romanini E, Zanoli G, et al. Monitoring outcome of joint arthroplasty in Italy: implementation of the National Registry. Joints 2017;5:70-78. https://doi.org/10.1055/s-0037-1603899
9 Tarantino A, Romanini E, Venosa M, et al. Registro Italiano Artroprotesi: curva di apprendimento e ottimizzazione delle procedure di immissione dei dati [Italian Arthroplasty Registry: learning curve and optimization of data entry procedures]. Recenti Prog Med 2020;111:327-330. Italian. https://doi.org/10.1701/3366.33414
10 Urakcheeva I, Saquella E, Biondi A, et al. Italian Arthroplasty Registry. Annual Report 2018 – Addendum. Roma: Il Pensiero Scientifico Editore 2020 (https://riap.iss.it/riap/en/activities/reports/2020/05/13/report-2018-english-addendum/, last accessed 2021 Sept 12).