The Role of a Nation-Wide Information System in Improving the Access to Surgery in Portugal

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Abstract. This paper describes the design and definitions of an information system (SIGLIC) to support a new integrated management program (SIGA) to improve the access to surgery in Portugal. SIGIC, the Ministry of Health’s agency responsible for access to surgery management, started re-thinking the system in 2005 by re-defining key processes and workflows. The designed information system SIGLIC integrates all hospitals with surgery with every other hospital, where it picks the data to help manage optimal solutions for each patient. The results since 2005 are very interesting and show the importance of an integrated information system to overcome the bureaucracy in the system: it was noticed a 50% improvement in scheduled surgical episodes and a 49% reduction in waiting time.

Keywords. waiting list for surgery, information systems, organizational processes, health information management

1. Introduction

The Portuguese National Health System (PNHS) services aims at serving all citizens. In this regard, the need for Information Systems (ISs) to address the exchange of information between different health institutions is critical [1]. Today, most of the problems have to do with lack of coordination between systems due to the use of different architectures and standards [2]. The Health Systems Central Administration (ACSS) has both responsibilities in addressing the “National Health Information Systems Infrastructure” and the development of “Surgery Access National Program”, among other things. ACSS started to implement the SIGIC (Integrated System of Management of the Waiting List for Surgery) program in 2005, following a less integrated program named PECLEC that started years before. By “Access to Healthcare” is meant the possibility that individuals have to get proper healthcare treatment according to their needs in order to have real healthcare gains [3]. In Portugal, this is a constitutional right for all citizens. Proper care treatment is understood as a combination of factors: the opportunity (on-time treatment), the gains in health
effectiveness), the adequate costs (efficiency), and the value felt by the patient. The need for regulation elapses from the fact that healthcare services are a scarce and valuable resource. PNHS has limited resources for 10 millions inhabitants: the numbers of healthcare centres (hc) in the public healthcare system in Portugal (North, Centre, Lisbon, Alentejo and Algarve Regions) are respectively: 105 hc, 111 hc, 84 hc, 44 hc and, 16 hc (255 hc in total). The numbers of hospital beds (b) in the public healthcare system (North, Centre, Lisbon, Alentejo and Algarve Regions) are respectively: 6,342 b, 4,763 b, 7,072 b, 1,412 b, 859 b (20,448 b in total). The numbers of National Reference System for Continued Integrated Care (RNCCI) beds (North, Centre, Lisbon, Alentejo and Algarve Regions) are respectively: 726 b, 871 b, 614 b, 266 b and 216 b (2,693 in total). These resources need proper and timely management. SIGIC defined that “Access” means to assure the treatment by services in the following terms [4]:

- Standards of technical quality of the healthcare services (quality);
- Maximum waiting time by medical priority and pathology (standards);
- Schedule rules safeguarding medical priority and time waiting (equity);
- Guarantees of alternative choice if waiting time is 75% of the maximum waiting time established (process);
- Transparency and guarantee of information quality (transparency).

2. Problem Specification

The existence of a significant number of patients waiting for treatment that exceed the clinical acceptable times has ominous consequences not only for the individuals (increasing suffering, reduce treatment success, more complex treatments) but also for the society (more expensive use of resources, higher absenteeism, etc), which made the government to take political measures like the creation of the SIGIC program.

In the recent past, the access to healthcare was carried through in a non-regulated manner and the integration of the different levels of treatment was inexistent. The citizen did not have the opportunity to participate in the process. The system evolved, with the expansion of new regulation units (SIGIC, MUCP, MUCIC[^2]) guided towards efficiency of the system centred in the patient. It was defined and consolidated healthcare referencing nets and it was strengthened the participation of the patient in the development of the processes [5]. It is understood as a global system that integrates the diverse levels of healthcare. The regulation is centred in the patient gains in health. As NHS is driven by the “Primary-care”, closer to patients, from which MCDT (Complementary Diagnosis and Therapeutically Means) are prescribed and hospital-care is referenced. SIGIC personnel works the data from surgical services, medical services, and other MCDT in order to manage the “surgery access” (with SIGA: the Integrated System of Management of the Access) and related it with Continued care and, Patient needs.

3. Methods

SIGIC goals are to reduce waiting time for surgery (improve the service), to apply identical standards to all patients (equity in access), to profit from good use of resources

[^2]: MUCP ist he Mission Unit for Primary Care; MUCIC is the Mission Unit for Continued Integrated Care.
(increase the efficiency) and, to create a national structure of homogeneous information based in a system of data collection (a database) that elapses from the production process (knowledge and transparency). The strategy chosen was the “survey of information systems and technology in Demand/Supply/Resources”, the “institutionalization and monitoring of procedural standards for management of the Waiting List for Surgery (WLS)”, to provide “evaluation by results” and, to regard the “Correction of deviations to the standard”. To fulfil SIGIC’s objectives (defined by law) it was created a management model and an IS to support it. SIGA is the integrated system of management of the access (includes the information model, regulation model, financial model, incentives and penalties). There are four main issues to be accomplished by SIGA: create knowledge, establish the equilibrium between demand and supply, guarantee the equity in access, improve the quality/efficiency, and tackle sustainability. Therefore, the SIGA mission is to serve well the citizen needs of surgical treatment. By now 66 public hospitals (all with sustainable surgery activity) and 54 private hospitals (with convention in SIGIC) had joined the SIGIC network (3,012 users).

Means to achieve the goals: After setting the goals and defining the targets, they were built the necessary instruments for pursuing them. The main targets identified were: increasing supply of “surgeries”, improving the management of WLS (i.e., creating the conditions to improve the use of surgical rooms and teams), supply and demand regulation, process improvement, assess the quality of services provided, guarantee of the access for all citizens and, improving the quality of information.

Processes Effort: Right from the beginning it was established a strong effort to properly define the workflow processes by involving all actors in the system. The result is “The circuit of the patient in WLS and in hospital transfers” (Figure 1).

Figure 1. SIGIC Access Governance Model

The “hospital of origin” (HO, the hospital where the patient had the consultation) of the patient classifies the patients according to their priority and tries to schedule a surgery for them on time. But, there is a time limit of 15 days to the HO surgery department reply for all cases: The HO must clarify and declare every lack of capacity for coping with high priority patients. It was defined a time limit of one month for the HO to perform the surgery. Otherwise the patient must be transferred to another hospital: From 1 to 6.75 months, as it is or not a priority patient, he is sent to another hospital, or even to a private hospital with a convention agreement with PNHS/SIGIC.
9 months (adjusted by pathology) is the maximum waiting time allowed. The circuit of the patient is always monitored in order to guarantee that the maximum waiting time is not reached.

### 4. SIGLIC: The Access to Surgery Information System Design and Implementation

SIGLIC was defined as an information system to allow real-time exchange of information to support all the SIGIC decision-making processes. The knowledge is integrated with a unified and coherent set of information that is based on the needs revealed by patients, integrating the production processes while generating cost and value and which culminates in the perception of the gains in health and the value perceived by the patient. The information model includes the following items: information on patients and events to allow “Process management”, “clinical information” for “Disease Management” and “financial data” to allow the “Contract management” between the health units, from which data is gathered to improve access management (quality treatment, i.e., gains in health, and value perceived for the patient). The information is recorded by hospitals (with the responsibility for the contents) in accordance with a set of standards and integrated into the central database of SIGIC. It was clearly defined who produced and signed the information, the minimal data set (standardized information), and all the information to be recorded is included in the workflow. The quality of integrated information from the hospitals is guaranteed by a set of tools to validate its consistency, rejecting non-compliant data. The information is recorded in hospitals throughout the process of managing the patient on WLS and integrated daily in the central database (Figure 2).

![Figure 2. SIGLIC – Process of acquiring the information. Flow of information between hospitals and the central database](image)

The transactions between hospitals and central database are (two-way) daily. They must be subjected to central data sync with the hospitals and there is a reporting system for errors that identifies gaps in the transaction. Thus the central IS does not create parallel processes and generates an integrated knowledge of hospital activity with 24 hours of delay. In SIGIC the information campaigns, the training sessions for professionals and the provision of quality information are key measures to promote the participation of all stakeholders in this process of improvement.
5. Evolution of the Performance Indicators on WLS

The results from SIGIC are very positive (Figure 3). The waiting time for surgery decreased from 8.6 to 4.4 months (-49%), the WLS reduced from 241,125 to 184,924 episodes (-23%), scheduled surgery increased from 269,946 to 403,723 episodes (+50%), and hospital transfer (a usual bureaucratic process) has increased from 3,003 to 38,976 episodes (+1,200%). This last result shows the real impact of an integrated IS over bureaucracy.

6. Conclusion

From the case presented one should conclude that SIGLIC, the IS that supports SIGIC, is essential to ensure the delivery of benefits to the patient and healthcare providers in access. The results are quite impressive, managed to overcome communication barriers and lack of operating rooms management practices. This is only part of a bigger effort to implement a comprehensive strategy to consistently allow information collection and sharing within Portuguese healthcare sector to improve resources use management.

References