Health Treatment and Management Optimization

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--**ABSTRACT**---

Why do some patients have no treatments when they arrive at a hospital service? Now and then, it is due to the lack of an effective implementation of a hospital referral network.
The implementation of a hospital referral network to promote healthcare is associated with the better global articulation of all hospital centers and their multidisciplinary teams. This permits lowering health care costs for patients and National Health Systems.
We here present an example of the implementation of a Hospital Referral Network with all its benefits and improvement of patient treatments.
The results show an efficiency of ~ 95% of patient treatments and a 17% cost reduction.
KEYWORDS: *Hospital Cost Efficiency; Radiotherapy Treatments; Healthcare Optimization; Hospital Referral Network*

I. INTRODUCTION

Why do some patients have no treatments when they arrive at a hospital service? Occasionally, it is due to the absence of effective implementation of the Hospital Referral Network (HRN).

An HRN is an important asset for wellbeing suppliers to monitor their patient records. Its principal objective is to improve and smooth out information among essential intervening key people: doctors, nurses, specialized medical attendants, and wellbeing suppliers associated with the patients. The point is to improve the general nature of care being; given by all interveners, diminishing operational failures, and upgrading existing cycles for medical care associations. There are various reasons why having an HRN is helpful. Medical Services overall are endlessly examined for their general significant expenses and wasteful cycles. Vastly programming systems for referral management were prepared as a possible answer for these issues. With the implementation of the software systems at the hospitals, medical services moved towards augmenting quality and proficiency, while additionally limiting expenses. This is apparent in the boundless selection of electronic clinical records at all levels and institutions. By executing, a compelling reference the wellbeing framework and administrations have seen a prompt decrease in leakage, quality confirmation for clinical strategies and treatments, with fewer patients leaving one service to another, sparing expenses. The implementation of referral networks has additionally led to more limited patient waiting times, higher patient contentment, to avoid superfluous travels to medical services clinical, and at last, more patients being seen with top evaluation quality. Another important aspect of the HRNs is that diverse clinical institutions can effectively trade patients' records that are crucial for health providers involved in the patient's care [1].

II. METHODS

A Hospital Referral Network must take into account the foreseeable evolution of populations' needs and achieve high levels of satisfaction. Therefore, the existence of an HRN is of utmost importance to allow the existence of an effective articulation between the different services that care for cancer patients. It has to be an agile, competent, easily accessible, un-bureaucratic communication system that allows the transmission of information and responsibilities with simplified procedures. Accordingly, the HRN is understood as an integrated health care delivery system, thought and organized coherently, based on principles of rationality and efficiency, both for the health care provider and for citizens who seek the same care [2].

The Nursing Information System (NIS) in Portugal is an evolutionary information system developed from the vast experience of two previous applications used by thousands of doctors, nurses, and other health technicians. It has grown to be a unique application, common to all healthcare providers and patient-centered. This tool is present in more than 50 Hospitals and Institutes and has about 60000 registered professionals. NIS is part of the strategy defined by the Ministry of Health for the area of clinical computerization of the Portuguese National Health System. It provides the standardization of clinical records procedures to guarantee the

standardization of all information. It permits access to the patient's varied clinical information, the use and sharing of data with health professionals from different areas, and the systematization and homogenization of all practices and information collected at the national level. The system, therefore, allows health professionals more effective and efficient that improves their role in multidisciplinary teams, thus enabling better support, assistance, and follow-up to the user. NIS provides a set of backup materials to help the utilization of the software. Organized by profile and functionality, this initiative intends to facilitate the utilization of the various potentialities of NIS, in the medical and nursing profiles. Access to the software is free and available in Ref. [3]. NIS was installed or "made visible" for the several care units in the project for the study. This initiative brings caretakers closer to their users. What follows are the first steps of the implementation of the NIS in our department.

III. RESULTS AND DISCUSSION

The impact and importance of an HRN are shown in a radiotherapy service at a hospital that also receives patients from other units (long and medium distances). The HRN implemented by the Nursing team had a positive impact, creating a "ripple effect" on workers and quality care. It was classified as a positive "entrepreneurship".

For the first six months of the evaluation, not all patients arriving at the radiotherapy service underwent the prescribed treatments and consequently nursing appointments, due to the deficiency of information and communication between the institutions involved. A further important aspect was that the further the patients came from, the probability of treatments being performed was less. Alternatively, the closer the institutes are, the closer are the protocols, procedures, and status updates of patients privileging enhanced conditions for treatments. In the second semester of the evaluation, while the COVID19 situation exploded worldwide there was a decrease in the optimization of the process results. This was caused by the saturation of the nursing teams involved. The specialized nurses were dislocated to mitigate the situation in other departments; in addition, all oncology patients had to undergo COVID19 testing before treatments. The majority of reasons for treatment failure are caused by the absence of complementary diagnostic medical exams. This happened mainly for hospitals that were not yet included in the HRN. Hence, it is possible to demonstrate the effectiveness of the protocol in action by observing Fig.1, where:

i) Patients from other institutions (longer distances) were not treated, due to the nonexistence of the HRN;

ii) The number of patients shown from medium distance units avoided traveling to undergo radiotherapy treatments, and;

iii) From the receiving hospital (short distance), there is almost a negligible percentage that failed medical procedures, with a slight increase in the second semester fundamentally due to the COVID19 situation.

These results indicate a well-expected accomplishment however, there is a large margin of progression as the HRN has only been implemented between a few units, and the full implementation with all the other centers, especially long-distance ones is still missing. Therefore, the unfavorable value (14% of patients without treatments) is on the verge of being solved by extending the implementation of the HRN. A side, but most important issue of the HRN is that it is not a closed structure, meaning when a new variable arises, like the COVID19 situation, it can be rapidly modified and updated to accommodate new issues that might hinder the objectives for an enforceable quality.

The other high-quality "side effect" with the employment of the HRN was cost reduction (17%). This is noticeable in several issues corresponding to diagnostic exams, primary care, staff planning, transportation, etc.
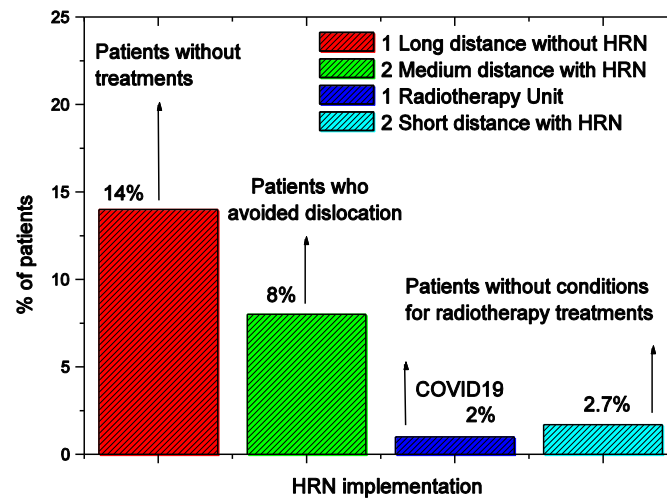
Fig. 1: hospital referral network in practice.

IV. CONCLUSION

The implementation of a hospital referral network to promote healthcare is associated with the better global articulation of all hospital centers and their multidisciplinary teams, lowering health care costs for patients and National Health Systems.

Excluding the long-distant units, the results show that after the implementation of the network an efficiency of ~ 95% of patient treatments was achieved. Albeit the novelty of the COVID19 pandemic, the implemented network manifested a rather fair response with only a 5% decrease in the optimization of the process results. The promotion of quality and better management of available resources yielded a 17% reduction of patient cost treatments.

To conclude, organizational communication channels, management/workflow capabilities, and multidisciplinary skills were developed between colleagues and hospital services. The reported patient benefits of an implemented hospital referral network include avoided traveling, reduced length of patient stay, better patient health outcomes, and lower risk of complications.

Acknowledgments

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