Electronic Referrals in Healthcare: A Review

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Abstract. This paper gives an overview of projects completed on the topic of electronic referral in healthcare. The first referral projects were based on standardized EDI-communication. The same basis is still used in many projects, but these are slowly being replaced by web-based solutions with possibilities for decision support and booking. The time from initiation of the first services to high volume use seems to be very much related to how well the new solutions fit with the general practitioners and specialists work practices, and if there are obvious benefits for the communication partners. High volume national services seem to require both political support and pressure. Some of the projects have not paid enough attention to sociotechnical approaches.

Keywords. electronic referral, booking, sociotechnical approaches, review

1. Introduction

A search for scientific papers related to the development of electronic referral systems has revealed that there have been few evaluations and reviews of such projects. Most related reviews cover telemedicine services more in general as [1–3].

The main sources for this paper have been scientific papers, but reports and interviews with people who work with referral-related projects have also been used as a basis. Many of the papers described planned or recently started projects, or projects that covered a limited number of users or few medical specialties. The main focus in this paper is on projects that seem to be of national interest and have been ongoing for some time, but some promising newly started projects are also mentioned. It has been a challenge that many projects are not regarded as research projects, and limited documentation about them is available in English. Most projects in this review originate from Northern-European countries, but it is likely that there are contributions from other countries available in other languages than English. The findings in this paper are still thought to be representative of trends in general.

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2. Referral Projects

2.1. Electronic Referrals in Finland

One of the first referral projects was initiated at the Helsinki University hospital in 1991 [4]. Two other projects were also well established early: One of them was a system for developed countries [5]. The other [6] was established in the Oulo region in Finland. All these three systems involved e-consultation in addition to referral.

According to the users, the e-referrals saved time and improved the quality of the documentation.

2.2. The MedCom-Projects in Denmark

The first Danish project started in Vejle in Fyn County in 1995 [7] and was based on EDIFACT-messages. Although Denmark started early, electronic referrals have had a slower uptake than most other health messages. 41% of the referrals were sent electronically in 2004, and 63% of the referrals were sent electronically in November 2008.

In June 2008, a solution called the “referral hotel” [8] was introduced and rolled out in full scale over a period of three months. The general practitioners (GPs) fill out the electronic referral in their electronic health record (EHR)-system and send referrals as EDI-message to a repository. The patient will then contact the specialist for appointment by phone or e-mail. The specialist retrieves the referral from the hotel by means of a standardized EDI-message. The patient can also ask the patient to send the referral directly to a named specialist.

MedCom reports that all GPs and specialists in Denmark currently have the access to the system, and that it is widely used. Use of the hotel is compulsory for the GPs. The development and management of the referral hotel is paid by the hospital regions.

2.3. National Health Service (NHS) and the “Choose and Book” System, United Kingdom

The Choose and Book system gives the patient the opportunity to book an appointment at a hospital or clinic either when the patient is at the GP’s office or the patient can book and/or change the appointment later. Choose and Book is a nationwide system, and can be used for booking appointments at any hospital funded by the NHS. It is also possible for the patient to check the status of the booking.

It took two years to get the first million referrals through the system, but in less than a year another 4 million referrals were through the system. According the NHS, 15,070 referrals were sent daily in October 2007, representing 45 percent of the NHS referral activity from GPs to specialist care.

2.4. ZorgDomein, Netherland

ZorgDomein is a commercial web-based product that includes clinical guidelines and information about the services that are offered. The project started in 1997 and the first implementation was available for use in 2001. The solution supports standardized cooperation between GPs and hospitals. Twenty-five percent of the regions, and 2000 GPs used the system in 2008. The GPs can choose from available services in the region and refer patients to the chosen hospital.
2.5. Electronic Referrals in Norway

Some Norwegian hospitals provide solutions for standardized referrals, and all the GPs EHR-systems are prepared for sending electronic referrals. Less than 25% of the referrals were sent electronically in January 2009. The basis for electronic referrals has been EDI-messages based on XML [9].

A national electronic booking project was established in 2002. The idea was that GPs in cooperation with the patient should book appointments at any Norwegian hospital. The use of the system has been very limited.

In parallel with the deployment of traditional EDI-messages, web-based solutions are planned at AHUS hospital, UNN in Tromso, Bærum hospital and St. Olavs hospital. These projects have a basis in the Norwegian messaging standards but represent a migration towards new solutions. The project at UNN is called the One-STOP project [10]. The objective of the One-STOP project is to study if standardized electronic referrals based on guidelines combined with electronic booking can decrease waiting time for out-patient surgery. The project at AHUS is a web-based referral solution linked to work with new national guidelines from the Directorate of Health. The project is intended to be deployed within the whole South-East regional health authority, which is the largest of the four regional health authorities in Norway. The project is linked to other projects at Bærum hospital and St. Olavs in hospital in Trondheim. The project in Trondheim has a focus on development of recommendations for referrals within different specialities. The intention is to combine the referral solution with the EHR-systems, decision support and clinical guidelines.

3. Discussion

When electronic referrals were introduced, many were hopeful that there would be large economic savings and many benefits for the users. Hasman [11] concluded that the use of standard messages for exchanging information between hospitals, GPs and pharmacies could result in relatively large savings. Harno et al. [12] examined the clinical effectiveness and costs of the referral process in the Peijas region in Finland. They also concluded that an electronic referral system between secondary and primary care would improve clinical effectiveness, lower direct costs, increase productivity and be cost-effective. A study with focus on quantifiable cost benefits in Denmark [13] also concludes that widespread adoption of electronic referral would be of significant benefit to the national economy.

The uptake of electronic referral systems has been much slower than expected. A survey [14] among the GPs gave a number of reasons for the limited use of Choose and Book. According to Eason many patients did not want to choose, the system did not provide the information they needed about clinics, it took a lot of time to work through options with patients and the GPs were worried about the security of patient information put into the system.

Even if many of the first initiatives, including the Norwegian ones, had a focus on organizational development, they have probably not paid enough attention to the interrelation between technology and its social environment. According to Berg [15], sociotechnical approaches aim to increase understanding of how new information systems and communication techniques are developed, introduced and become a part of social practices. Berg suggests that the largest challenge for the sociotechnical
approach is how to interrelate the nature of health care work with the characteristics of formal tools.

The intention behind the Norwegian booking system was to reduce the number of cancellations and give the patient in cooperation with the GP the option of freely booking between hospitals. The system was intended to be used for cases when it was not necessary to send a referral, but the GP could book appointments in accordance with guidelines from the hospital. It turned out that the specialists did not want GPs to book appointments without them being able to prioritize the patients according to information from the referral letter. The GPs found it time consuming to search for “the best” hospital together with the patient. Many of the patients did also not want to be involved in this process themselves, and wanted the GP to make the decision. The presence of the patient, also made it difficult not to book available timeslots, i.e., to book on behalf of the patients preference and not in accordance with the hospitals priority policy [16].

Reponen [6] assumes that their roll-out process of electronic referral was successful because they used a special team consisting of primary care physician, University physicians and a nurse in charge of education and planning of e-service usage. They worked at all the clinics and were involved in planning customized workflow changes. The rollout process was described as demanding because many actors were involved.

A series of semistructured interviews with involved partners in ZorgDomein [17] showed that the project positioned itself in a controversy on the role of primary vs secondary care diagnostics. The project could imply a new distribution of tasks between GPs and medical specialists, and it was also a concern that the role between diagnostic centres and hospitals could be changed.

If the technology cannot be seen as useful for the parties involved, the solution will not work in practice. When it comes to electronic referrals and booking, it is essential that the parties involved see what is beneficial for the patient and society as a whole, as opposed to how the system affects themselves as an individual. This is a challenge in a market-driven system where specialists, hospitals and GPs get paid according to the services they provide. The GPs would not like to spend extra time together with the patient to try to find the “right” hospital and make a booking, if this responsibility can be given to the patient instead. The Danish referral hotel transfers the responsibility for making an appointment from the GP to the patient. ZorgDomein and Choose and Book also provide the same option. In Norway, politicians, patients, and GPs would probably be skeptical to use this kind of solution, seen in light of prior experiences.

4. Conclusion

Ongoing referral projects differ a great deal. There is not likely to be one best solution that proves to be beneficial for all countries. Legislation, organization of the healthcare system and cultural differences are factors that may influence the choice. Electronic referrals seem to have a large potential for economic savings as a whole, but it takes longer time than expected to realize this potential. Denmark seems to be successful with a short roll-out period for the referral hotel, but for most of the systems examined, the deployment process has taken much longer than first expected.

Electronic referrals are requested in many countries, but it is likely that the roll-out process still will be slow, and that there will be a migration towards new solutions. In
some countries booking of specialist services will probably also be more accepted and more easily fitted within work processes than booking at hospitals, because hospitals in many cases would like to have control over the priority between different patients.

Many of the new referral projects provide possibilities for booking in combination with clinical guidelines [18] and streamlining the referrals according to the particular needs for different specialties and/or local hospital/region needs. Sociotechnical aspects are often underestimated. If the new solutions cannot easily be a part of the clinician’s work processes, the roll-out process will probably be slow.

Whatever solution is chosen, it will probably be necessary to have support for the project at a national level, and as part of a national strategy. Coiera [19] also states that strong political support is a key factor. Coiera recommends that Australia should start with just a few national clinic centers and after they have been successful, migrate to the rest of the health system.

References