

A Bespoke Home Oximetry E-Referral System

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INTRODUCTION

Pulse oximetry can be used to diagnose serious but relatively common conditions such as obstructive sleep apnoea (OSA). Pulse oximetry is a low cost, simple diagnostic test that can be performed by the patient at home.

The Medical Physics Department at the James Cook University Hospital (JCUH) has created a Home Oximetry Study E-Referral System (the system) which streamlines the patient referral process into the Home Oximetry Service, and has resulted in a paperless workflow. Additionally, this tool enables the department to monitor patient delays and referral statistics with potential to improve service quality and patient experience.

METHOD

The system has been custom designed as it needed to be integrated with an existing MS Access database which stores patient's overnight oximetry results. We have split between the front and back end.

We have ensured data is kept secure and compliant with the Data Protection Act 1998 and local Information Governance Policies. The system will continue to be compliant with the General Data Protection Regulations (GDPR).

The web front end was written in C# and ASP.Net, using customised bootstrap CSS for styling.

It was developed to be secure by using features such as encrypted URL strings to prevent sensitive identification data being viewed in the URL and as clear text over the network which can be viewed by packet sniffing. We have reduced the risk of SQL injection by using SQL Parameters in the C# code to prevent SQL injection.

The web front end integrated with the existing MS Access Database using a linked table, which allowed the existing database to access the actioned referrals from the referral system. The system also utilises a MSSQL Database for admin authentication, system logging/auditing and email alerting.

RESULTS

Since the implementation of the system, over 400 referrals have been created. Each referral contains data which we can use to accurately determine waiting times for patients. We have demonstrated that we can audit referrals at each step of the process, from the initial input to final processing.

As a result we are now easily able to effectively monitor key performance indicators (KPIs) and demonstrate compliance to meeting these KPIs. Patients benefit from improved monitoring of the patient pathway and identification of delays.

Fig1 shows the monthly referrals. It can be seen that in the first two months there are no referrals as this is the initial development of the system.

In May and June we released a beta test of the system, then back to two months development. We then released the system in September 2017.

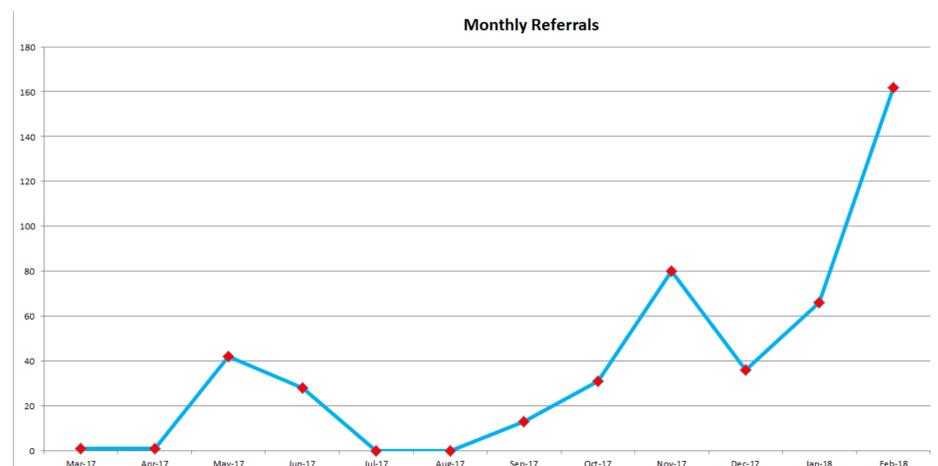


Fig1. Source: Ox Refer Database

DISCUSSION

Further beneficial developments include the creation of web-based visual representation of data and the creation of further tools which mine the data. There is the scope of automated highlighting of patients exceeding the required referral time frame and graphical representations of data.

The system could be migrated fully to MS SQL Server from MS Access.

CONCLUSION

The move from paper to electronic referrals has been positive. Collecting referral data electronically has helped to streamline the referral process whilst providing easier to access statistics which can be used to monitor patient pathways and provide useful performance indicators.

The system was designed with much involvement from the system users, requiring much iteration. This led to a more agile approach to the software development and has maximised the user value of the system.

Home Oximetry Referral | Home | Referral Request | Home Oximetry Clinics | Admin

Welcome to the Home Oximetry Referral Portal
Here you can request a referral for Home Oximetry Studies.

Referrals Dashboard

Refer New Patient

Refer New Bariatric Patient

Refer Review Patient

Referral Statistics Overview

47

New Referrals
Over the last 7 days

23

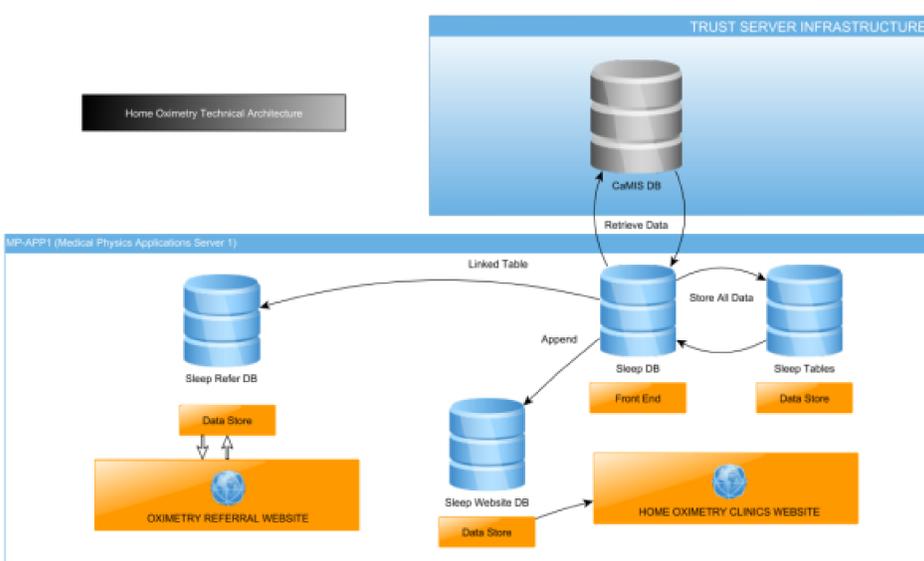
Pending Referrals
Waiting to be actioned

36

Actioned Referrals
Actioned in the last 7 days

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