Development of a web-based financial application for clinical trials pharmacy services

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Introduction

Clinical trials are an essential part of translating medication into effective new therapies to improve health outcomes. Conducting a clinical trial requires dedicated experts and individual steps of trial conduct are highly time consuming and resource demanding. To ensure that there are adequate resources for the efficient provision of clinical trials pharmacy services, fees are levied to cover the costs. Most clinical trials pharmacies operate as not-for-profit entities and have a limited funding. Historically, finance related tasks have taken up a considerable amount of pharmacy staff resources. The Clinical Trials Pharmacy and Health Intelligence teams at The Royal Melbourne Hospital collaborated to develop a new web-based clinical trials pharmacy financial administration application.

Aim

The web-based financial application was developed to streamline the invoicing procedures so the workload of clinical trials pharmacy staff administering finance related tasks is reduced.

Background and Action

Clinical trials are conducted under clinical trials agreement between the sponsor and the hospital. Pharmacy fees are also listed under these clinical trials agreements. Rather than applying a one-fee-fits-all approach to pharmacy fees for clinical trials, fees are determined based on a number of factors, including:

- Year of study initiation
- Study duration
- Number of study drugs
- Complexity of dispensing
- Complexity of study drug preparation
- Complexity of study drug management procedures
- Commercial vs non-commercial sponsors

A side-effect of having a variable-fee structure is that the invoicing activities for pharmacy staff becomes complex and resource-intensive.

The old invoicing system involved multiple Excel worksheets and Access databases to record and extract relevant pharmacy fees as described in Figure 1.
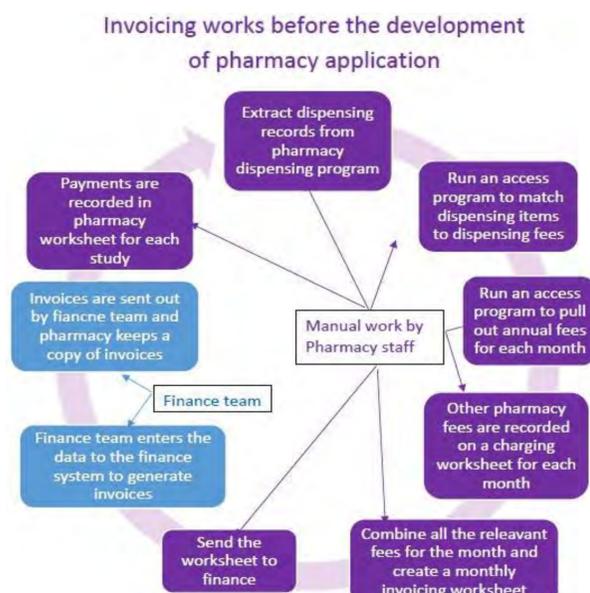

Figure 1. Pharmacy invoicing work procedures before the development of pharmacy finance application

It required a substantial amount of manual record keeping, data entry and transferring of data between applications. As a result, errors were common, leading to delays in payment.

On average, using the old invoicing system, it used to take an average of 60 hours of a pharmacist's time each month to manage approximately 300 clinical trials. Additionally, the hospitals finance team spent a significant amount of time manually generating pharmacy invoices.

The clinical trials pharmacy team wanted a comprehensive database system to store clinical trial details together with invoicing data for a more efficient invoicing system. The finance team wanted a programmed data file to upload into their finance system which would then generate invoices automatically. Therefore a multi-disciplinary team of pharmacists, financial accountants and application developers worked together to develop a web-based application with the goal of integrating the hospital's existing finance system with the pharmacy dispensing system to manage the finance aspects of clinical trials pharmacy.

Discussion

The new clinical trials pharmacy financial application has a main list (Figure 2) which contains;

- Clinical trial number
- Protocol number
- Details of sponsor
- Clinical research organisations
- Name of principal investigator
- Unit
- The status of study with site initiation dates

Figure 2. Study list from clinical trials pharmacy finance application.

The list has search functions and also can be filtered.

Each study has clinical trial information page with correct invoicing details and additional information as per the clinical trials agreement.

The study list opens up a study medication page with matching dispensing fees for each study medication and a fees page which lists all the other pharmacy fees such as establishment fee, annual administration fee, protocol amendment fee, study completion fee, storage fee, drug destruction fee etc.

Once all the study information and invoicing details are entered on the application, invoicing items are entered directly on the application as it occurs for each month for monthly invoicing.

The application downloads dispensing data from pharmacy dispensing program and lists the dispensing fees under each study (Figure 3).

Figure 3. Pharmacy financial application showing detailed description of pharmacy fees on invoice.

The application is programmed to extract the name of clinical trial medication (in a blinded fashion, if applicable), subject number, visit number and dispensing date automatically, so there is no need to manually enter this data.

At the end of each month, clinical trials pharmacy staff reviews the automated invoicing report for accuracy and to finalise the invoices. Once finalised, the application produces a data file which is uploaded to the hospital finance system which in turn, automatically generates and emails invoices to the relevant clinical trial sponsor.

The application has replaced all Excel spreadsheets and Access databases which were previously used (Figure 4).
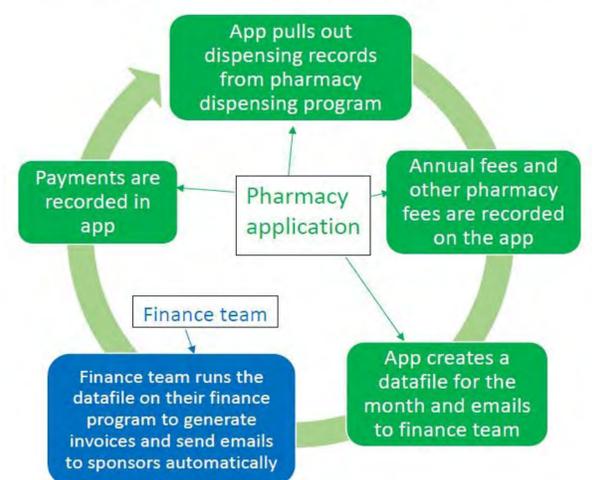

Figure 4. Pharmacy invoicing work procedures after implementing the pharmacy finance application

Evaluation

The application has reduced the total time spent generating invoices for clinical trials pharmacists to less than 3 hours a month, representing a 95% reduction in time spent when compared to the previous invoicing procedure.

Conclusion

The clinical trials pharmacy financial application simplified the invoicing procedures and significantly saved the pharmacist's time when generating invoices.

Contact details

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