OpenEyes - Event Alerts

Editors: G W Aylward
Version: 0.9:
Date issued: 11 November 2010

Target Audience

General Interest	✔
Healthcare managers	✔
Ophthalmologists	✔
Developers	✔

Amendment Record

Issue	Description	Author	Date
0.9	Draft	G W Aylward	11 Nov 2010

Table of Contents

Introduction

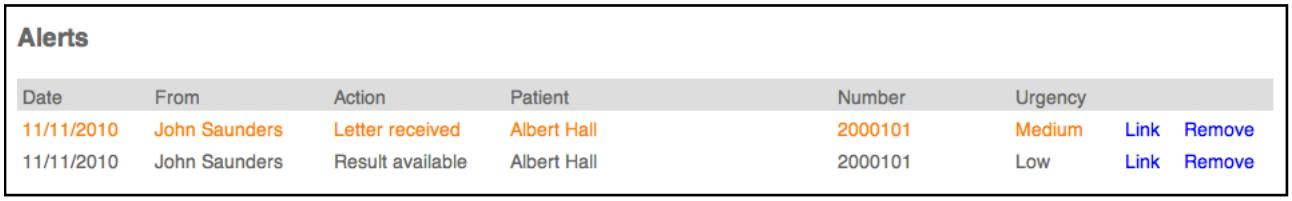
Items of information that may enhance the clinical management of a patient, often arrive in a healthcare environment at unexpected times. Examples include correspondence, and the results of investigations. In principle the clinician ordering an investigation is responsible for ensuring the result is both seen, and acted upon. However, in practice conventional paper systems make it very difficult to ensure this happens reliably. Such results may arrive as isolated pieces of paper in the in-tray of a clinician, but unless the notes are also retrieved, it is not possible to put the result into clinical context. More commonly, it is only when the patient returns to the outpatient clinic that results are seen, and even then only if they are pinned to the front of the paper notes. This is not a robust system, and there are also occasions when results should be acted on before the patient comes to the clinic. This is a fertile area of clinical risk, and OpenEyes needs a reliable system to deal with it. This document describes how 'event alerts' can address and solve this problem.

Event Alerts

An event alert is a lightweight message that is sent to an OpenEyes user when an item of information, such as an investigation result, is added to the system. The alert appears in the 'inbox' of the user on the home page (which is displayed once the user has logged on). Clinical alerts are like emails, but bound to the relevant patient's record. An alert contains the following information;

Item	Description
Date	The date and time when the item was added to OpenEyes
Patient	The name of the patient
From	The user who added the item
Type	The type of item that was added (letter, ultrasound result etc)
Urgency	An indicator of urgency (low, medium, high)

Most importantly, the display includes a hyperlink which calls up the relevant item, and displays it within the context of the clinical record. The following figure shows an example of alerts displayed on the home page;



Alerts are not automatically deleted when the link is viewed, but remain in the user's inbox until manually removed.

Targets

The recipient of an event alert will usually be an identified user, such as the Consultant in charge of the patient, but events may also be targeted to a role, such as 'Ultrasonographer'. There is also a system whereby users can flag their absence and redirect the alert to a deputy (similar to the 'out of office' function in many email servers.

Examples

There are several areas in which event alerts are used within OpenEyes, and these are listed here.

Incoming correspondence

The addition of a scanned letter to the system sends an event alert to the recipient of the letter (usually the Consultant in charge of the patient). The recipient is then able to read the letter within the patient record, so that any relevant clinical information is also available.

Questions

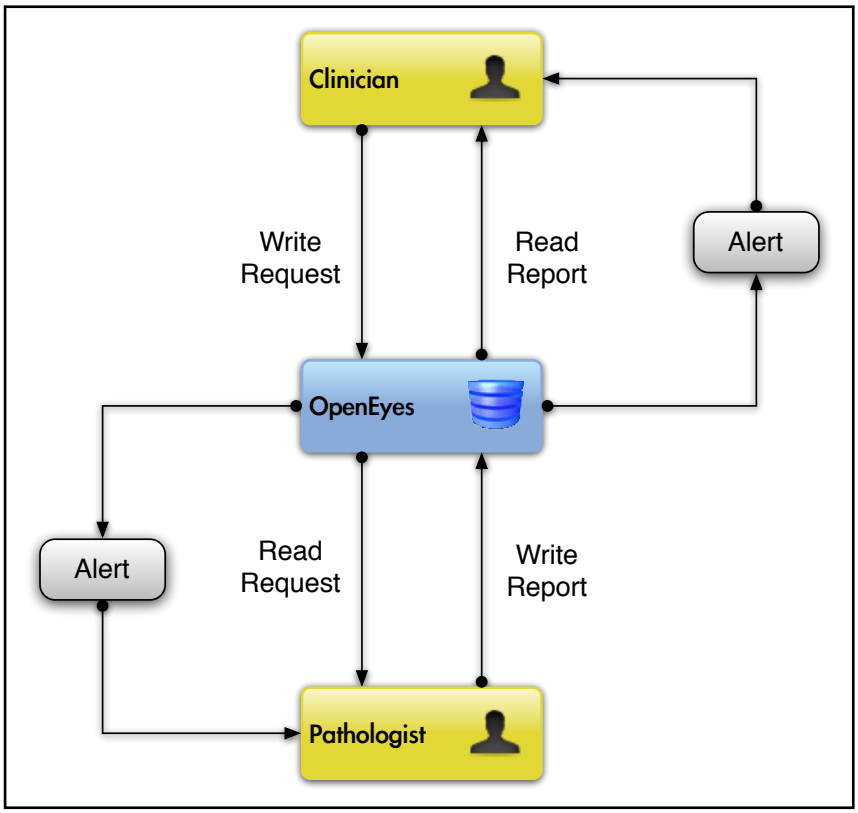
The addition of a 'question' event sends an event alert to the target of the question, and the addition of an answer sends an alert the other way, so that the questioner knows that the question has been answered.

Investigations

The submission of an investigation request form may send an alert (where appropriate) to an identified individual, or role who is responsible for taking action (to carry out the investigation). When the result is available, an alert is sent back to the user who requested it. This work flow is described in detail as follows, using histopathology as an example;

1. **A user fills in a histopathology request on OpenEyes, and saves it.**
2. **An event alert is sent to an identified individual (or role) in the pathology department**
3. **The pathologist views the request within the full clinical context (by viewing the full record)**
4. **The pathologist adds their report to OpenEyes and saves it.**
5. **An event alert is sent to the user who requested it, copied to the Consultant in charge of the patient.**
6. **The user reads the report within the full clinical context (by viewing the full record)**

This workflow is illustrated in the following diagram;



Implementation

Event alerts are implemented within OpenEyes using a very simple system of table entries. The ‘eventalerts’ table has the fields described in Appendix 1. Sending an alert is accomplished by simply adding a row to the this table.

In cases where it is appropriate to send an alert to a role, then the RBAC is interrogated first to determine all users who are assigned to that role, and an alert is then sent to each of them.

Appendix 1

Structure of the eventalerts table;

Field	Type	Comments
eventalert_id	INT UNSIGNED NOT NULL AUTO_INCREMENT	Primary Key, 4 billion
patient_id	INT UNSIGNED NOT NULL	Foreign key referencing the patient to which this event belongs
event_id	INT UNSIGNED NOT NULL	Foreign key referencing the event to which the alert pertains
touser_id	INT UNSIGNED NOT NULL	The id of the user to whom the event alert is being sent
fromuser_id	INT UNSIGNED NOT NULL	The id of the user from whom the event alert is being sent
action	ENUM(‘Letter received', 'Review', 'Result available', 'Image available', 'Question', 'Booking required', 'Request')	Action required of the user
urgency	ENUM('Low', 'Medium', 'High')	Urgency
is_done	BOOL	Flag indicating alert has been read and acted upon