Reducing Risk in Electronic Messaging: Best Practice in Implementing Australian Standards for Application Acknowledgements

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Problem Statement

The successful transfer of electronic referrals and results from the senders' Electronic Medical Record (EMR) computer systems to the EMR recipients' computer systems is subject to a number of possible errors. The Health Level Seven (HL7) electronic clinical messaging specifications provide a means to confirm through the use of Application Acknowledgements from the EMR to the sender that their referral, results or transfer of care message has been received by the intended recipient.

Application Acknowledgements are generated by the actual EMR when a message is successfully imported into the patient management system. In contrast, Transport Acknowledgements are generated by the electronic message delivery system. The Transport Acknowledgement indicates that it has been delivered to a machine, that is, the message has gotten to the receiver's internet server. This does not equate to a full transfer of care as the message is not human readable or regularly looked for by the clinician who is dependent on their EMR for all things.

Unfortunately many EMR vendors have not built the Application Acknowledgement functionality into their systems. This leaves a gap in the process where, if a message goes undelivered to the EMR, the sender will be uninformed. The acceptance of Transport Acknowledgements as final indicator of transfer of care places patients, doctors and healthcare providers in an unnecessary position when the last point of transfer into the EMR fails. If the sender is able to diligently track Application Acknowledgements, with the assurance of all recipient EMR systems complying with best practices, then, when a result is not received into the EMR system, it becomes immediately obvious, and necessary follow up processes can begin.

The Scale of the Problem

The clinical risks arising from unsafe use of electronic messaging are very real. Examining current data from HealthLink for August 2012 for HL7 messaging shows:

- For Laboratory Results 81.15% return a positive Application Acknowledgement; 0.04% returns a negative Application Acknowledgement and 18.81% return no form of Application Acknowledgement
- For Referrals, Summaries and Discharges 85.54% return a positive Application Acknowledgement; 0.27% returns a negative Application Acknowledgement and 14.19% return no form of Application Acknowledgement

While the failure to return an Application Acknowledgement is largely associated with limited software functionality on the receiver EMR system end, the rational to not make such capabilities mandatory or best practice will further cloud whether a sending provider

dangerously and falsely assumes that the transfer of care has been successful. Just think about this in the context of an abnormal result not being correctly imported by the recipient EMR system. If we estimate that 0.1% of messages have a true failure due to sporadic events that are unable to be controlled, this would equate to the following number of messages not being reviewed by a GP:

- 8,000 specialist referrals by GPs
- 7,500 discharge summaries to general practice
- 10,000 radiology reports for GPs
- 60,000 pathology reports for GPs

In the current environment where best practice is not implemented, it is possible that the failure rate is even higher. This small risk is being clouded by the much larger numbers we are seeing with the inadequate use of Transport Acknowledgements. It will be even further clouded if we are not attempting to use the benefits of best practice use of Application Acknowledgement with emerging message formats like Clinical Document Architecture (CDA) and making it a requirement of Secure Message Delivery (SMD).

Emerging messaging developments will not ameliorate this problem over time as EMRs are upgraded. Application Acknowledgements are not being treated as best practice in the Standards development processes around the use of CDA message types and the requirements around SMD. The argument being that Transport Acknowledgments are sufficient practice and business processes should take responsibility. Business processes do have responsibility when the electronic processes are implemented using best practice principles, but should not be an excuse to cover for poor electronic implementations.

The Solution

The solution is to get all EMR systems to import messages in common use as defined by the family of Australian Standards of HL7 (AS4700)[1] and to generate an appropriate Application Acknowledgement. These Australian Standards cover the exchange electronic pathology orders and results (AS4700.2 – 2004)[2]; electronic referrals, discharge summary, status and discharge summary messages (AS4700.6)[3]; and radiology results and orders (AS4700.7)[4] and detail how Application Acknowledgements can be generated. Emerging message payloads like CDA and the use of SMD should also be based on the same principles of best practice through the use of Application Acknowledgements.

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[1] AS4700: The family of Australian HL7 Standards used for the exchange, integration, sharing, and retrieval of electronic health information

[2] AS4700.2 – 2004: The HL7 v2.3.1 Standard commonly used by Australian EMR systems to exchange electronic pathology orders and results.

[3] AS4700.6 – 2004: The HL7 v2.3.1 Standard commonly used by Australian EMR systems to exchange electronic referrals, discharge summaries, status and discharge summary messages.

[4] AS4700.7 – 2005: The HL7 v2.3.1 Standard commonly used by Australian EMR systems to exchange radiology results and orders.