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How can we close the loop on test results to reduce risks associated with diagnostic error in Emergency Departments?

Stakeholder Dialogue Summary

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June 2018

ISSN: 2208-6080

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Conflict of interest: The authors have no conflicts to declare.

Citation: Wright B, Lennox A, Bragge P. *How can we close the loop on test results to reduce risks associated with diagnostic error in Emergency Departments?* Melbourne, Australia: BehaviourWorks Australia, Monash University. June 2018. ISSN: 2208-6080

This program is funded by the Victorian Managed Insurance Authority

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Executive Summary

A day-long, structured stakeholder dialogue was conducted on June 19, 2018 to address the issue of "*How can we close the loop on test results to reduce risks associated with diagnostic error in Emergency Departments?".* This project was funded by the Victorian Managed Insurance Authority (VMIA). The dialogue was attended by 7 people representing government, insurance, clinicians, and research. A briefing document presenting findings of a rapid review of academic evidence, practice interviews and citizen's panel outcomes pertaining to this topic was sent to all dialogue participants in advance of the dialogue. The dialogue had three aims:

1. Gain a shared understanding of evidence, practice and key issues in the Victorian Emergency Departments

A number of key themes arose in the discussion, including:

- The process of ordering, receiving and acting upon radiology and pathology tests when a patient presents to an emergency department takes place in a complex system with multiple actors. Due to the time involved in ordering, evaluating, reviewing and reporting diagnostics tests, it is often the case that the person who ordered the test has completed their shift before the definitive test results are known. The patient may also have moved to a different part of the hospital or been discharged. There are a lot of assumptions that the system functions a particular way – for example that someone else will take responsibility for following up or actioning reports.
- It can be difficult to know who should be responsible for making sure that diagnostic test information is received, viewed, and acted upon.
- Radiology and pathology differ significantly with regards to diagnostic test processes. Preliminary reports from radiology tests dictate early clinical management, with definitive findings available within the next 8 – 15 hours. Preliminary radiological findings may be altered upon review by more senior radiologists, in some cases necessitating substantial (and sometimes urgent) changes in clinical management. Like radiology, pathology tests are also acted on based upon initial findings, however a longer time period (48 – 72 hours) is generally required for definitive results, for example to grow and identify a bacterium. Therefore, treatment based upon pathology findings may evolve from broad to more targeted antibiotic and other therapies; however radical changes in clinical management when the final report is sent are rarer compared to radiology.
- Many clinicians want to filter out 'normal' test results and only view abnormal. However, when tests are ordered, minimal information is often provided about the patient. Therefore, it can be difficult for radiology or pathology to know what 'normal' is in each context.

2. Identify interventions to review diagnoses in Emergency Departments that could be trialled and scaled across Victoria

A range of suggested options were deliberated upon taking account of feasibility and sustainability. The discussion focused at the system, rather than the individual level, specifically where in the system an intervention is most appropriate, the differences between radiology and pathology, who needs to be involved and in what circumstances should 'closing the loop' be strengthened. Deliberations

focused on the evidence to support interventions, implementation considerations and what has already been tried. There was further discussion regarding how to focus the intervention on the most relevant test results due to the large volumes that clinicians must contend with.

3. Prioritise an intervention and determine measures of success

Following discussion, a behaviour change trial was framed with a focus on radiology results that are critical or have changed between the preliminary and final reports would elicit two actions. First, the radiologist will call the relevant clinician and send a time-stamped message to record that they have contacted the clinician. Second, the clinician will acknowledge receipt of the message and action as appropriate. Communication of test results to the patient is another important outcome, being the final point of 'loop closure'.

Pilot Behaviour Change Project Outline

Background and Aim

"Closing the loop" on test results includes transfer of information from sender to recipient, but also acknowledgment of receipt by the recipient, and recorded follow-up actions on the test result (Kwan and Singh 2017). The Australasian College of Emergency Medicine (ACEM)'s policy on the follow-up of results of investigations ordered from EDs is that *"Clinicians in emergency departments must ensure that the results of investigations ordered from that department are followed up within a clinically appropriate time frame."*

In the emergency department (ED), up to 75% of test results are missed and the potential impact on patient outcomes. Misinterpretation or delayed communication of imaging findings can certainly lead to a breakdown in the progression towards clarity of diagnosis and appropriate patient care (Siegal, Stratchko et al. 2017). Incomplete, unclear, or non-standardized communication in radiology or pathology reports may lead to misinterpretation of the results by referring clinicians. This can result in either inappropriate treatment or lack of treatment (Allen, Chatfield et al. 2017).

Clinicians must at times contend with a huge number of test results to review. When there is a backlog, and a huge volume of tests, many clinicians will only check or review abnormal test results, particularly for fracture results. This means that there are many test results that are not viewed or acknowledged by clinicians. Even when this does occur, there is often no definitive record of who has contacted who, and when, due to the turnover of shifts and possible patient movements into other units. This means that on the rare occasions when the system fails, health services may be unable to demonstrate what actions were taken at what time to mitigate adverse outcomes.

This project aims to identify an intervention that can help 'close the loop' on test results between radiology/pathology, ED and the patient to ensure that all relevant clinical information is viewed by the clinician and incorporated into treatment decisions. Importantly, a key aim is to generate a record of loop closure, formalising processes that may be currently occurring, but not documented.

Rationale

There are results and information from tests ordered from radiology and pathology that are critical to patient management and treatment. Clinicians currently have difficulty accessing or checking all relevant information of a patient's history and tests, whether because they don't know that a report has been updated or because they can't see previous test results.

However, currently there are no consistent and documented systems to ensure that critical information is received. This is potentially exacerbated in the ED with rotating staff. There is significant disconnection between all aspects of the system – the setting where tests are ordered, the imaging rooms or pathology laboratories, the setting where test results are sent (which may be different if the patient has moved) and the patient. Electronic Medical Records (EMR) are not part of all these systems and where they are, they don't always communicate with each other, even within a health service and more so between health services.

Currently, there is no way of knowing if someone has opened and viewed test results after they have been sent; acted upon the information received; or communicated this to the patient. This is exacerbated in situations where reports are updated or altered – in which case communication through a fractured system must be repeated. This has implications for patient treatment, especially where care needs to be escalated as a result of updates to diagnostic test findings.

Thus, this intervention will aim to test if formalising a system where confirmation or acknowledgement is required, improves the communication of critical information.

Methodology

Population: Radiologist. and ED clinicians.

Intervention: Changed or critical radiology results have been acknowledged (time-stamped) as read and/or actioned as appropriate. An acknowledgement of loop closure.

For the radiology technician, for changed or critical results, they will find and call the relevant clinician or role, and make a recordable time stamped message (via Medex for example).

The receiving clinician must then acknowledge receipt of the message and action as appropriate.

Depending on volume/scope, this could potentially be restricted to CT scans (even abdominal CTs). Focusing on CTs may capture most of the critical results that need to be communicated.

Comparison: The intervention will be compared to usual practice.

Outcomes:

Clinician outcomes

- Compliance with intervention
- Perceived usefulness
- Changes to diagnosis / treatment
    - Change / no change

Patient outcomes

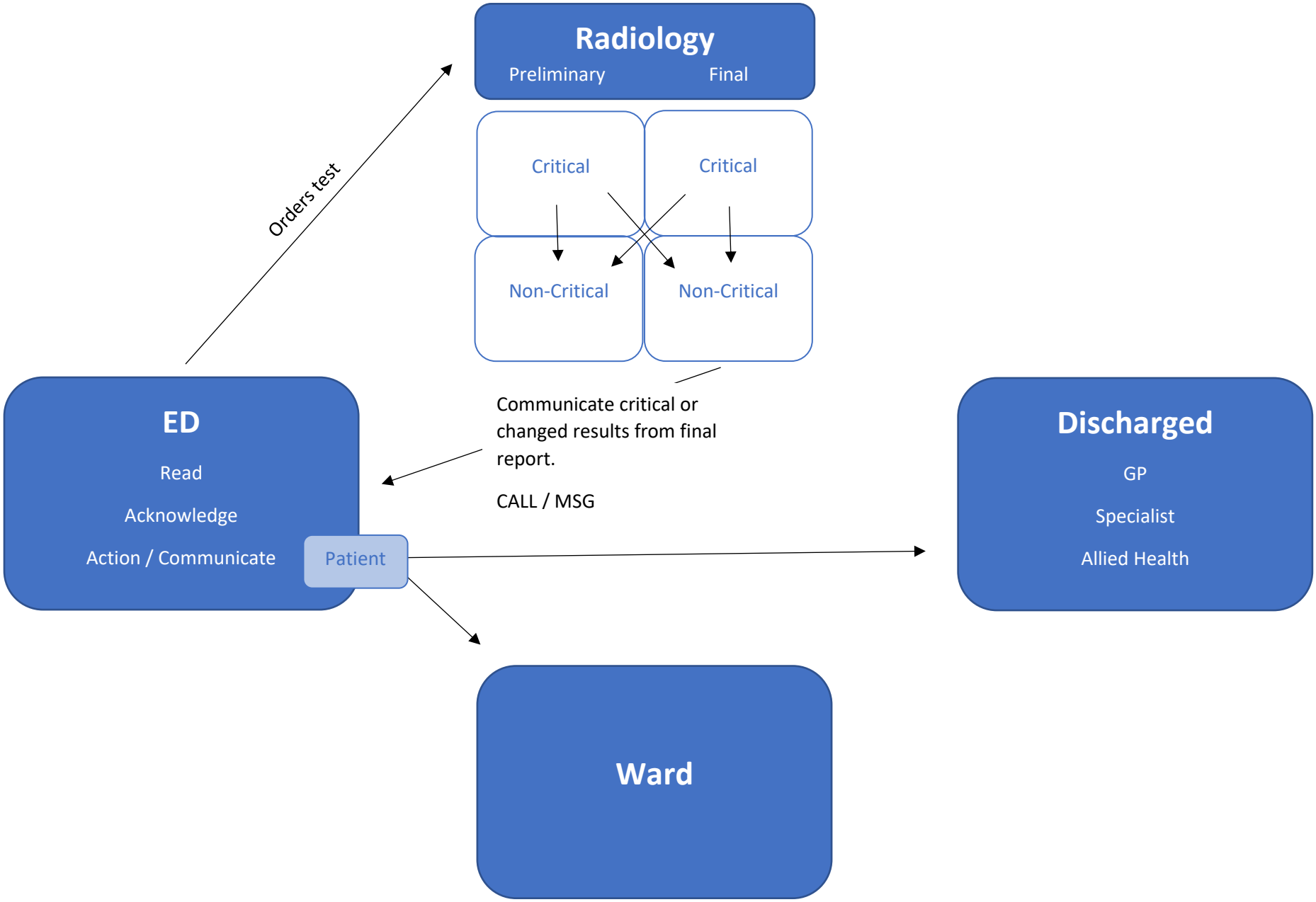
- Have the results been communicated to the patient
- Change in patient management or treatment
- Ultimate outcome / diagnosis
- Information communicated to the patient

Organisational outcomes

- Patient flow (flowmetrics, patient journey)
- Length of Stay
- Re-presentations to hospital within 24-72 hours following discharge
- Test changes / using new test
- Medication changes / using new medication

Considerations and details to resolve:

- Need to establish what current practice looks like
- Needs to be EMR, IT and paper compatible
- What does this look like in regional / rural areas?
- Will the receiving clinician record their response?
- How many hospitals have role based positions?


Radiology
Preliminary
Final
Critical
Critical
Non-Critical
Non-Critical
Orders test
ED
Read
Acknowledge
Action / Communicate
Patient
Communicate critical or changed results from final report.
CALL / MSG
Discharged
GP
Specialist
Allied Health
Ward

Key Themes of the discussion

Assumptions

The current system is based on assumptions, including thinking that the next person will read and action what they need to and pay attention to the relevant information. There is an assumption that the current systems will catch pertinent information, however there are currently no fail safes.

Common assumptions:

- Meaningful clinical information will have been included in the test order
- Someone else will read the report.
- Someone else is responsible.
- Someone will action the report if necessary.
- Someone will take responsibility and take on accountability for the results or change in results. This can be adding notes to the GP as well.
- Discharging with the assumption that the GP will follow up.
- Patients have a GP.
- Specialists, e.g. cardiologist, may assume that if it's not related to their area, that someone else may follow up with something.

Assumption that biggest errors are between labs and ED. But most radiologists will ring through the 'big ticket' items. The issue happens when a radiologist registrar reports as normal, consultant comes next day and they change the report. There is a disclaimer "this is a preliminary report" – but most act on registrar's report. If the consultant makes a substantive change, then consultant should contact the ED.

Who's responsibility?

Who is responsible for making sure the relevant person gets the results? Radiology and pathology try to get onto the right person but may not always be possible. Tests may come back to other people; to a person in ED who has a designated role, or another clinician, or wherever they have been admitted to.

Someone has to take on the responsibility of telling the patient and managing the result or any changes.

The person who is most invested is whoever's patient it is but if they've gone home or things have changed, then role-based ppl are easier to deal with.

Role of technology

With the increasing use of EMRs, technology is fundamental to how departments communicate. In Victoria, there are different systems in different hospitals, this can lead to a lot of frustration because there is unnecessary over-ordering. And not being able to see previous results means clinicians can't see changes in test results if they have to be re-ordered.

Medex – is a smartphone app, it's whatsapp for hospital doctors, except that you communicate with a role rather than a person. It's easy, and it's auditable. If you're a role based person you have to act on that information because it's part of your role. Can acknowledge messages in a recorded way. It may also be possible to escalate to other people if the original recipient is unable to respond. This will likely replace older forms of communication, e.g. fax.

What's normal?

Many clinicians won't view normal reports. Clinicians want to filter out normal, but the radiologists think that this shouldn't happen because they can't know what's normal in relation to the patient (e.g. is an additional rib relevant to the case?) without clinical context, normal is impossible to define.

Pathology vs Radiology

While things can be missed in radiology, in pathology, if there is an indication that anything is growing, then they'll generally start on broad spectrum antibiotics and then once there is more definitive information, that is refined but it is rare for something to go from no problem to big problem.

The underlying problem of funding

Whilst beyond the scope of this project, it should be acknowledged that there is still an underlying problem of lack of resources and funding. The system doesn't have enough people to read all the results and to make sure that everything is followed up. For this project we are working within the system as it currently stands.

Appendix 2: Background and methods of stakeholder dialogue

The stakeholder dialogue was convened to enable a comprehensive discussion of relevant considerations (including research evidence) about a highpriority clinical or system issue in order to inform action. The key features of the dialogue were:

1. It identified an issue that was considered a high priority;
2. It focused on different features of the problem, including (where possible) how this differed across settings and contexts;
3. It was informed by a pre-circulated briefing document that summarised contextual information on the current situation;
4. It brought together parties who would be involved in or affected by future decisions related to the issue;
5. It engaged a facilitator to assist with the deliberations;
6. It allowed for frank, off-the record deliberations, by following the Chatham House rule:
   "Participants are free to use the information received during the meeting, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed"; and
7. It did not aim for consensus.

Participants' views and experiences and the tacit knowledge they brought to the issues at hand were key inputs to the dialogue. The dialogue aimed to connect the information from the briefing document with the people who can make change happen, and energise and inspire the participants by bringing them together to address a common challenge. This use of collective problem solving can create outcomes that are not otherwise possible, because it transforms each individual's knowledge to a collective 'team knowledge' that can spark insights and generate action addressing the issue. This dialogue summary was prepared based upon notes of discussion taken independently by a BehaviourWorks Australia staff member (audio of stakeholder dialogues is not recorded). These notes were analysed to identify key themes and other information relevant to identifying priority areas.