Patient Safety Tip of the Week

April 17, 2018

More on Tests Pending at Discharge

The problem of significant abnormal test results "slipping through the cracks" is a serious cause for preventable adverse patient outcomes and a leading cause of malpractice settlements. A subset of this problem has to do with "tests pending at discharge". This refers to tests that were performed during an inpatient hospitalization for which the formal interpretive report has not been completed before the patient is discharged from the hospital. We've discussed this in our Patient Safety Tips of the Week for March 1, 2011 "Tests Pending at Discharge" and August 21, 2012 "More on Missed Followup of Tests in Hospital" and the list of other columns below.

In our March 1, 2011 Patient Safety Tip of the Week "Tests Pending at Discharge" we discussed a systematic review on the safety implications of missed test results in hospitalized patients (Callen 2011). This is an issue we have harped upon in many previous columns and the findings in the new review are no less frightening. They found **lack of followup on test results** ranged from **20-60% for inpatients** and **1-75% for emergency room patients**. And the lack of followup had clinical implications since some of the results were considered critical or urgent or otherwise actionable.

A couple factors in recent decades have contributed to this problem. One is the pressure to shorten hospital lenghs of stay. The second has to do with the widespread adoption of hospitalist programs. Don't get us wrong. We love hospitalists! But the nature of hospitalist scheduling often leads to reports being sent to a hospitalist who will not be at the hospital for a considerable period of time or even never again. In our March 9, 2010 Patient Safety Tip of the Week "Communication of Urgent or Unexpected Radiology Findings" we noted a study (Were et al 2009) which showed that only 16% of tests with results pending actually are documented in discharge summaries. They identified multiple changes in attendings as an issue and difficulty identifying the physician who will ultimately follow the patient after discharge. We also noted in our October 13, 2009 Patient Safety Tip of the Week "Slipping Through the Cracks that studies have shown sending reports to two physicians, rather than increasing the likelihood someone will follow up, **actually doubles the risk that no one will follow up** (Singh 2009)!

Dalal and colleagues (Dalal 2018) at Brigham and Women's Hospital (Partners HealthCare) recently reported results of a cluster-randomized controlled trial assessing the impact of automated notification of tests pending at discharge (TPAD's) on documented follow-up in the EHR. (Note that we've described some of the design and implementation of such systems by Dalal and colleagues (Dalal 2011, Dalal 2012) in previous columns.)

Patients discharged from general medicine and cardiology services with at least one TPAD between June 2011 and May 2012 were assigned to intervention or usual care groups based upon the randomization status of their discharging attending and PCP. They adapted an established algorithm to identify **actionable** TPAD's. All normal, near-normal, and benign results were excluded. 7.5% of all TPAD's sampled were determined to be actionable and underwent subsequent chart review. Examples of actionable TPAD's include malignant cells in pericardial fluid cytology, low vitamin D level, HIV genotype, positive urine culture, low protein C level, gastric biopsy positive for H. pylori, and positive hepatitis C antibody. Most commonly documented actions included establishing, changing, or confirming a diagnosis and communicating results with the patient.

Most TPAD's were generated on patients discharged from general medicine services. The most frequent test type was chemistry/hematology. Most discharging attendings were male and had 5 years or less of experience. 66% of patients had non-network PCP's. The proportion of actionable TPAD's listed as pending in the discharge summary was 50.7% and 49.5% in the intervention and control groups, respectively.

The proportion of actionable TPAD's with documented action was not statistically different for the intervention arm compared to usual care (60.7 vs. 56.3%). But almost all (97.4%) instances in the intervention arm who had action had evidence of documented action on the same day.

The proportion of actionable TPADs with documented action was significantly higher for pathology compared to other test types (77.2 vs. 48.5%). There was a non-significant trend towards increased proportion of actionable TPADs with documented action for patients discharged by hospitalists compared to non-hospitalists (62.3 vs. 54.4%). There was a significantly greater impact of the intervention on documented follow-up of actionable TPAD's among patients with network PCPs (70 vs. 50%). There was no evidence of effect modification of the intervention by clinical service, provider type or experience, test type, or number of actionable TPAD's per patient.

Even with the automated notification system there were still approximately **40 percent of patients who had no evidence of documented follow-up for actionable TPAD's**, including several patients with biopsy specimens that revealed malignancies.

The proportion of actionable TPAD's lacking documented follow-up was 39.9% for acknowledgment, and 41.1% for action. Types of actionable TPADs without documented follow-up included abnormal vitamin levels ($n = 25$), pathology specimens ($n = 15$, including 6 malignancies); abnormal rheumatology titers ($n = 9$, including an extremely elevated anti-DS DNA titer); abnormal endocrine results ($n = 8$); abnormal viral tests ($n = 8$, including an elevated HCV viral load); positive microbiology cultures (4); and miscellaneous (32)

Notably their healthcare system also had separate notification systems running in parallel for pathology and radiology. The authors suspect that may account for the higher

proportion of pathology follow up action documented and for the very low number of radiology TPAD's identified (most significant radiology TPAD's were identified prior to discharge).

Note that this study only included patients who were inpatients. It did not address the issue of **patients seen in the ED** and discharged before official reports of all tests were done. The ED is particularly vulnerable because the individual ED physician may not be returning to the hospital soon (or never in some circumstances). So the ED medical director or his/her designee must be assigned the task of going over the previous day's tests to ensure no test results are "pending" and have not been acknowledged by the original ED physician. Similarly, particularly for radiology studies, each facility must have a system in place a system where the ED physician's interpretation of an imaging study is reconciled with the official radiology report and any discrepancies get back to a party in position to take appropriate follow up action.

The other issue it does not address is **the amended report**. We discussed that in our Patient Safety Tips of the Week for October 2, 2012 "Test Results: Everyone's Worst Nightmare" and March 12, 2013 "More on Communicating Test Results". Each facility must have in place a system in which any report that is amended gets conveyed to a party responsible for the patient.

Although the study did not show significant improvement in the proportion of actionable TPAD's with documented follow-up, they did observe significant improvement in time to documented follow-up favoring the intervention.

The study does demonstrate that the system designed at the Brigham resulted in significant improvement in documented follow-up for patients of network PCP's and shortened the time to follow up action. One other positive aspect of the study is that Partners HealthCare clearly has a good algorithm for identification of potentially actionable TPAD's (tests pending at discharge). In our Patient Safety Tip of the Week August 21, 2012 "More on Missed Followup of Tests in Hospital" we discussed some of the barriers to identifying all those pending test results and in being able to attribute responsibility for followup to the correct party.

Also, since the Brigham is a tertiary referral center and a very high percentage of inpatients were non-network patients (66% of their patients had non-network PCP's), it might be anticipated that a system like theirs might be more effective in hospitals that have a higher proportion of in-network patients and PCP's, such as community hospitals.

It's also encouraging that the systems for communicating significant results for radiology and pathology seem to be working well at the Brigham.

And it's encouraging that the percentage of discharge summaries identifying tests pending at discharge has improved since our original columns (the proportion of actionable TPAD's listed as pending in the discharge summary was 50.7 and 49.5% in their

intervention and control groups, respectively). But that's still short of the 100% target we have.

But the Brigham study found that about 40% of actionable TPAD's did not have follow-up documented in the EHR, including a few high-risk results such as malignancies. The study shows that we still have a big gap in "closing the loop" on test results when patients are discharged prior to official test result reports being available.

To address this gap, Dalal and team envision integration of newer digital health tools with the hospital's electronic health record that not only notifies discharging attending physicians and primary care physicians, but that empowers patients to make sure their test results are followed-up in a timely manner. They note that most major EHR vendors can extend existing functionality to externally notify clinicians of actionable TPAD's via institutional email, secure messaging, or mobile app "push" notifications. They can also flag importance in subject headings or notification banners, facilitate knowledge transfer between key inpatient and ambulatory clinicians; and request acknowledgment electronically.

See also our other columns on communicating significant results:

- Patient Safety Tip of the Week May 1, 2007 "The Missed Cancer"
- Patient Safety Tip of the Week February 12, 2008 "More on Tracking Test Results"
- Patient Safety Tip of the Week October 13, 2009 "Slipping Through the Cracks"
- What's New in the Patient Safety World July 2009 "Failure to Inform Patients of Clinically Significant Outpatient Test Results"
- Patient Safety Tip of the Week March 9, 2010 "Communication of Urgent or Unexpected Radiology Findings"
- Patient Safety Tip of the Week March 1, 2011 "Tests Pending at Discharge"
- Patient Safety Tip of the Week August 21, 2012 "More on Missed Followup of Tests in Hospital"
- Patient Safety Tip of the Week for October 2, 2012 "Test Results: Everyone's Worst Nightmare"
- Patient Safety Tip of the Week for March 12, 2013 "More on Communicating Test Results"
- What's New in the Patient Safety World October 2013 "New AHRQ Toolkit: Improving Your Office Testing Process"
- What's New in the Patient Safety World January 2014 "Email Alerts for Pending Test Results"
- What's New in the Patient Safety World July 2015 "Technology to Avoid Delays in Follow-up of Significant Results"
- Patient Safety Tip of the Week November 17, 2015 "Patient Perspectives on Communication of Test Results"
- Patient Safety Tip of the Week December 20, 2016 "End-of-Rotation Transitions and Mortality"

References:

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Were MC, Li X, Kesterson J, et al. Adequacy of Hospital Discharge Summaries in Documenting Tests with Pending Results and Outpatient Follow-up Providers. Journal of General Internal Medicine 2009; 24(9): 1002-1006 http://springerlink.com/content/57u6374273282457/?p=8d1facb4fd6c402a9b895f3a46a59022&pi=1

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