

Lost in the Black Hole

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The Case

A 38-year-old married, monogamous female came to the emergency department with aseptic meningitis. She had a remote history of gonorrhea, no environmental exposures, and had not taken any non-steroidal anti-inflammatory or sulfonamide drugs. She was admitted to the hospital and cared for by a hospitalist, who suspected that the patient might have acute HIV and ordered a test for HIV quantitative PCR. The test result (positive, with a viral load of 32,000 copies/mL) came back more than 1 week after the patient was discharged, and the hospitalist noted it. However, the laboratory indicated that the batch was "defective" and the test needed to be rerun. The hospitalist never received the new report and, lacking a reminder system, forgot to follow up on the result. Neither the patient nor the primary care physician was notified that an HIV test was pending, so neither of them followed up on this test result. The error was first recognized 6 months later when the hospitalist stumbled upon the original test report while cleaning out a desk.

In fact, the patient's aseptic meningitis was her first manifestation of acute HIV seroconversion. Although it was unclear whether the delayed notification had adverse clinical consequences (the role of antiretroviral treatment during primary HIV infection is controversial), it caused the patient major emotional distress, delayed referral to an HIV specialist, and raised the possibility of unprotected intercourse during the 6 months during which she was seropositive but unaware of her diagnosis.

The Commentary

Although continuity of care is a laudable goal, having a single doctor manage care in all settings is nearly impossible. Primary care physicians (PCPs) are under pressure to see more outpatients in less time, and the average PCP now spends relatively little time in the hospital. A growing literature has established the value of specialized care for complex diseases or in complex settings.⁽¹⁾ Interest in patient safety and quality has catalyzed the creation of teams (often physician-led) that can focus on improving the systems of care in a given setting.⁽²⁾ Taken together, these forces have led to the development of the hospitalist, to manage and coordinate inpatient care and help improve systems of care.^(3,4) Early literature supports the premise that switching from PCP-based to hospitalist-based inpatient care can improve efficiency, quality,

and teaching.(5-8)

Several questions about the hospitalist model still must be answered.(9) One is the impact of the "purposeful discontinuity" that the model introduces between inpatient and outpatient worlds. This case, in which a critical laboratory test result fell into the "black hole" that often separates a hospital stay from the follow-up setting, highlights the problem. A recent study found that nearly one in five patients experienced an adverse event during the transition from hospital to home; two-thirds could have been prevented or ameliorated with better bridging.(10) A simple follow-up call by a pharmacist can prevent some post-discharge adverse events.(11) However, few institutions have such a system, in part because it is neither reimbursed nor emphasized. Many providers and health care organizations lack *any* organized approach to preventing transitional errors. Such approaches involve three areas: clear delineation of roles and responsibilities, better methods for transmitting verbal data, and information technology.

The first issue is the clear delineation of roles and responsibilities. Malpractice law, mostly drawn from transitions in Emergency Medicine, places duties on *both* the hospital-based physician and the PCP.(12) Practically, though, saying that both the hospitalist and the PCP are responsible after discharge creates false redundancy: because neither is unambiguously responsible, too often both will assume that the other will follow-up. I believe that the hospitalist does maintain responsibility for ensuring that critical laboratory tests drawn on his watch are followed-up, either by doing it himself or by confirming that the PCP accepts this responsibility. In this case, the hospitalist did neither—an error of omission.

The role of a third party—the laboratory itself—has been underemphasized. Courts have held that radiologists have an obligation to ensure that critical findings (such as abnormal mammograms) are transmitted to the relevant provider (13), and one could make the same argument for key lab studies such as positive HIV tests. Interestingly, this hospitalist's (appropriate) decision to run a quantitative HIV PCR may have facilitated this error by exposing another hole in the Swiss Cheese of our data transmission "system." Had the usual HIV ELISA screening assay been run (whose results return "positive" or "negative" for HIV), the lab probably would have made sure that a positive result reached the correct physician. The quantitative PCR test for HIV viral load, however, is usually used to monitor response to therapy in patients with known HIV. Thus, clinical labs generally do not notify individuals of the test's results, lest they be calling incessantly. This case illustrates the one situation in which the test is used *diagnostically* rather than to follow therapeutic response: in acute HIV infection, the ELISA HIV test may be falsely negative (it may take weeks after seroconversion to turn positive) and the HIV PCR is the more sensitive test.(14) In fact, the reporter of this case mentioned that the hospital's order form for HIV PCR now (as a result of this case) queries whether the test is being sent to diagnose HIV or follow its course. If the former, the lab treats the result as it would any new diagnosis of HIV and contacts the responsible physician. This modification represents an admirable example of a systems change in response to an error.

In addition to follow-up, the mechanisms for passing a baton must become more robust. One study found that being covered by another physician was a more powerful predictor of hospital complications and errors than was the severity of a patient's illness.(15) The same researchers instituted a standardized computerized sign-out system, and the error rate fell by two-thirds.(16) By increasing the number of handoffs, new housestaff work-hour restrictions mandated by the Accreditation Council on Graduate Medical Education (ACGME) may have the unintended effect of *increasing* medical errors unless methods

can be found to prevent the degradation of information during transfers of care.⁽¹⁷⁾ In our department, we recently initiated a computerized sign-out system in response to this increase in handoffs.

Although computerization of information transfer is part of the answer, verbal handoffs will always occur, and can often be "sloppy." Other fields that transfer critical information verbally have developed methods to minimize the risks. For example, workers in commercial aviation and the military read-back key transmissions and use standard language and alphabets (such as the NATO system of "Alpha-Bravo-Charlie-Delta") to minimize misunderstandings. Restaurants may take verbal handoffs more seriously than hospitals: you are more likely to hear "let me read your order back to you" when you call a restaurant for takeout than when you call a colleague to sign out a patient or to issue a verbal order.⁽¹⁸⁾

Although it would be easy to blame this error on a forgetful hospitalist, preventing transitional errors requires that health care systems put attention and resources into preventing such fumbles. Until systems become more robust, physicians will need to develop their own micro-systems for following up on key tests (such as paper, PDA, or computer-based "tickler" systems), using these prompts to remind themselves to contact both patients and physicians. Some large primary care, hospitalist, and emergency department groups have created methods to follow-up test results, such as designating a single responsible physician, nurse, or clerk to check all lab and x-ray studies and ensure that the results reach the appropriate provider.

The days in which a single physician can be responsible for patients in all settings will live on only in Marcus Welby reruns. Patients will constantly be moving from setting to setting and from provider to provider. This places a great responsibility on individual providers and health care systems to ensure that handoffs aren't dropped. As it stands now, if our health care system was an NFL team, we would lead the league in fumbles. We can and must do better.

Take-Home Points

- Handoffs are the price we pay for the benefits of specialized care.
- The hospitalist model is growing rapidly, but has the side effect of creating another transition of care at hospital discharge.
- Improving care across transitions will depend on clearly delineating responsible parties, creating standard methods to ensure accurate transmission of verbal information, and using information technology.
- Standard information transfer protocols, such as reminder systems to cue providers to check tests, mandating that laboratories or radiology departments contact providers about critical lab values, and read-backs of key verbal information, have been used to great effect in other industries and should be adopted in health care to prevent transitional errors.

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