

On the Other Hand

May 1, 2007

Henneman EA. On the Other Hand. PSNet [internet]. 2007.

<https://psnet.ahrq.gov/web-mm/other-hand>

The Case

A young woman with Takayasu's arteritis presented to the hospital with severe abdominal pain. The patient had been diagnosed with Takayasu's a decade earlier. The disease results in arterial stenoses, which can cause ischemia in a variety of organs. One of the diagnostic clues is differential blood pressure (BP) in both arms (if there is more arteritis in one of the arm arteries than the other), and in fact the patient had been noted in the past to have very different BPs in her right and left arm. This had been recorded in her chart but was not noted in her hospital room or on her person.

The patient was admitted at 6:00 p.m. to the intensive care unit (ICU) for monitoring, pain medication, and intravenous (IV) hydration, in preparation for vascular surgery the next morning. The IV, with normal saline, was started in her left arm.

During the night shift, the midnight BP measurement using the right arm revealed a very low pressure (approximately 70 systolic). The nurse notified the covering resident, giving him a concise description of the patient, her primary admitting diagnosis, the surgery plans, and a report of the vital signs. The resident, who had been given only a brief signout on the patient (that did not include the history of different BPs in the two arms), was quite worried about the hypotension and ordered Levophed (norepinephrine), a powerful IV pressor. He did not examine the patient—if he had, he would have found that her mental status was normal, which might have been a clue that the true BP was not as low as the reading. The nurse took the resident's verbal order for the medication and administered the drug.

When the surgical team arrived in the morning, they were puzzled by the low BP (since the patient appeared to be otherwise stable) and asked that the BP be reassessed, once in each arm. When the pressure was measured in the left arm, it was noted to be within normal range, even as the pressure in the right arm was still very low. The team immediately discontinued the pressor order, believing that the patient's true BP was the one from the left arm, and that the right arm reading was due to local vascular narrowing. Although giving a vasoconstricting medication to a patient with narrow blood vessels could have had catastrophic effects, no adverse outcomes were noted in this case.

The Commentary

Because of failure to identify this patient's preexisting BP differences, she was mistakenly placed on a powerful IV vasoactive agent, which could have led to a myocardial infarction or a stroke. Takayasu's arteritis is a rare disease—as a practicing critical care nurse with almost 30 years of experience, I can say I have never heard of it. The definition of Takayasu's arteritis from the Merck Manual is "an inflammatory disease of unknown cause that affects the aorta and its branches."⁽¹⁾ Because of its rarity, it would be easy to suggest that the errors in this case stem from the patient having a relatively uncommon diagnosis. But, in fact, the issues presented by this case have little to do with the patient's medical diagnosis. Clinicians working in ICUs are frequently responsible for the assessment and management of patients with unusual conditions, uncertain diagnoses, and rapidly changing hemodynamic status.

This case raises multiple patient safety concerns. They relate to both the knowledge and experience of the clinicians caring for the patient (human factors) and to system failures related to accessing information, communication, and collaborative care planning.^(2,3) While it is likely that clinician inexperience played a role in this case, the system failures are by far the more compelling concerns.

Inability to Access Critical Information

A serious yet common system failure in this case was the inability of clinicians to easily access critical information. Data about the patient's baseline BP differences were not available to either the nurse or resident despite having been previously noted and recorded in her medical record. In addition, no alerts were available to the nurse and resident about the assessment and management of BP in a patient with Takayasu's arteritis.

Timely access to critical information is an important patient safety concern. The lack of technology (e.g., electronic medical records, clinical decision support systems) to support bedside clinicians is a serious shortcoming of our health care system.⁽⁴⁾ Emergency departments, general patient care units, and ICUs typically use different forms and flow sheets to document findings. Access to these records is cumbersome at best, and busy clinicians do not have the time to search through paper records. As a result, clinicians rely heavily on other methods of communication such as verbal report, "cheat sheets," sign off records (index cards), and handwritten reminder notes posted over the head of the patient's bed. These commonly used communication mechanisms are rarely part of the patient's permanent record, and there is frequently no set hospital policy that governs their use.

The problem of access to critical information is compounded by the physical limitations of the patient care environment. Medical charts (paper and electronic) are often inaccessible to the clinician providing care to the patient at the bedside. Space limitations, infection control issues, and privacy concerns often preclude access to electronic records in "real time." The use of wireless, hands-off accessing of information and documentation has great promise for decreasing errors related to communicating and receiving critical data. For example, one can envision that a patient like this might have a wirelessly transmitted alert emanating from her room, which would automatically alarm (or even provide a computerized voice warning through a communication device that all nurses would carry). Like all alerts, once the technological obstacles are overcome (wireless communication throughout the floor, all nurses carrying the appropriate

receivers), the main challenge will be deciding which conditions merit alerts, balancing the need to transmit information against the ever-present risk of "alert fatigue."

The use of other innovative technologies such as temporary tattoos has been recommended as a way of alerting clinicians to unique patient assessment requirements. For example, a temporary tattoo could be used during the postoperative mastectomy period to remind professionals and technicians to avoid the use of a particular limb for venipuncture or BP measurement.⁽⁵⁾ For the patient in this case, a "do not take blood pressure in this arm" temporary tattoo could have been applied ([Figure](#)). Sleeves that cover an arm to indicate "no venipuncture or blood pressure measurement" have also been used. Methods of alerting the bedside practitioner are promising, yet they introduce new safety concerns. The use of any bedside or applied patient alert (e.g., allergy bracelets, overhead signs, tattoos) relies on clinicians to verify their accuracy, apply them correctly and in a timely manner, and systematically re-verify and update them over time. For example, wristbands are sometimes used to alert the nurse administering medications about potential patient allergies. These wristbands need to be applied by health care personnel who are knowledgeable about medications and allergies. If a patient develops an allergy later in the hospital stay, this alert mechanism requires that someone re-enter the new information in both the patient medical record and on the wristband. The fact that critical information needs to be entered in multiple places (i.e., in the medical record and on the patient) may increase the risk of error. So, although these methods offer hope, they should be studied before widespread implementation.

Failure to Communicate/Collaborate

The difficulty in accessing information in this case was compounded by a failure on the part of the nurse and physician to engage in effective communication and collaboration related to the patient's assessment and plan of care. The need for accurate and timely communication is imperative to patient safety and has been integrated into the patient safety goals of many organizations.⁽⁶⁾ Although the nurse caring for the patient gave a concise description of the patient, she failed to communicate a critical finding, that is, the patient's mental status. The resident caring for the patient was placed in a difficult situation because he had received only a brief signout from his physician colleague. Nonetheless, neither the nurse nor the resident recognized the potential critical nature of the situation and the need for more collaboration about assessment and care planning.

Another failure of communication/collaboration involved the resident, attending, and other members of the surgical team. Clearly, the resident lacked sufficient familiarity with the patient and the diagnosis. It is disconcerting that there appeared to be no consultation with the attending physician responsible for the patient. It is also troubling that the surgical team appeared to be unaware of the patient's hypotensive status when they arrived in the morning despite the patient having been hypotensive and receiving treatment for several hours throughout the night. From a systems perspective, there is no evidence that any back-up was available to the resident, and if there was, it is unclear why it was not used.

What is also not evident from the case study is the extent to which the patient and family were involved in the assessment and care-planning process. Patients with chronic conditions (and their family members) are often very knowledgeable of their disease state and are typically aware of unique assessment findings such as very low or very high BPs. Experts suggest that the work environment of ICUs must be reorganized to

systematically include patients and family members if patient safety is to become a reality.(7,8) It is quite likely that a discussion with the patient and family may have been all that was needed to explain the low BP in the right arm and avert any potential for harm. Because most of the case occurred during the nighttime, the family may have been unavailable, but the patient was noted to be alert and may well have offered the information if asked. It is not clear what the visitation practices were at the hospital, but many ICUs still restrict family visitation, so it is possible that the family presence was restricted, adding to the communication problem.(9)

Nurses and physicians play a pivotal role in patient safety. Surveillance of the patient and environment, communication, and collaboration all are necessary to prevent error and adverse outcomes.(10-14) This case study is not atypical. It exemplifies the many potential problems that can occur when a lack of access to critical information and communication/collaboration failures impact our patients and their families.

Take-Home Points

- Use structured communication forms/checklists when giving information to other caregivers to ensure that "critical" data are consistently relayed between clinicians.
- Minimize the use of "cheat sheets" and other handwritten reminders that are less likely to be systematically included in the "hand-off" process.
- Allow time for a comprehensive report at nursing change of shift and during physician "hand-offs."
- The use of point-of-care reminders about key patient issues (such as through the use of temporary tattoos or wristband reminders) may help prevent errors but should be studied for acceptability, utility, and unexpected consequences.
- Involve the patient and family in the care-planning and decision-making process.
- Collaborate with fellow clinicians to evaluate unusual assessment findings or plans of care. Use the expertise of senior nurses and attending physicians.

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Figure

Figure. Temporary Tattoo Indicating "Do Not Take Blood Pressure from This Arm."

Figure courtesy of MEDtoos (<http://www.medtoos.com>).



This project was funded under contract number 75Q80119C00004 from the Agency for Healthcare Research and Quality (AHRQ), U.S. Department of Health and Human Services. The authors are solely responsible for this report's contents, findings, and conclusions, which do not necessarily represent the views of AHRQ. Readers should not interpret any statement in this report as an official position of AHRQ or

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