# TiPS®

**NCPS**
VA National Center for Patient Safety

## Contents

## Communicating Safely Through the VA's Electronic Health Record

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Communication break-downs are responsible for a significant number of adverse events in health care – and communication among VA health care providers is increasingly dependent upon the VA's electronic health record, the Computerized Patient Record System (CPRS).

Although electronic communication overcomes many of the limitations of paper-based records, it remains vulnerable to break-downs. This is especially relevant in the ambulatory care setting, where communication occurs across care teams, geographical locations, and health systems, and the time lag between communications may be lengthy. Despite these challenges, many break-downs in electronic communication are preventable.

The mission of our Patient Safety Center of Inquiry (PSCI) is to reduce preventable events in ambulatory care by improving the process of electronic communication. Below, we explore three key issues relevant to safety of electronic communication in CPRS, along with illustrative examples from our recent work.

### Information Overload

The complexity of CPRS and the availability of large amounts of clinical data may pose unusual cognitive demands for busy clinicians. The CPRS interface and functions must be well matched to the user's ability to process, integrate, and respond appropriately to new information. Suboptimal system designs may have direct consequences on patient outcomes when, for example, critical communications are overlooked in the midst of competing demands on the provider's attention.

*Example:* communication via the View Alert System. The View Alert System in CPRS notifies the designated provider(s) of new test results and other pertinent clinical information. While this automated system helps to ensure that critical information about a patient reaches a responsible provider, it also means that providers receive a large volume of alerts in their View Alert window. Pro-

viders may be overwhelmed by the number of such notifications to the extent that some of the information is overlooked. If providers receive 50-100 or more such alerts per day, it is not surprising that some of the notifications are never reviewed.[1]

The appeal of access to a large amount of clinical data must be balanced against the real possibility of information overload. Although achieving this balance is a long term challenge, some improvement can be made in the short term. For instance, our work revealed opportunities to increase providers' awareness of CPRS features that allow them to better manage and customize notifications. We are now evaluating ways to tackle "alert fatigue," including strategies to minimize unnecessary alerts.

### Clarity of Provider-to-Provider Communication

To date, great strides have been made to improve clarity and reduce ambiguity of communication between members of health care teams. Electronic communication is itself a solution to many of these problems. However, electronic systems introduce new and often unanticipated constraints and challenges to effective communication.

*Example:* medication orders. Potential safety issues in Computerized Provider Order Entry (CPOE) have now been described extensively in the literature. Many concerns are related to the inflexibility and usability of CPOE systems. The VA's CPOE overcomes some of these limitations by offering a free text field that providers can use to clarify or comment on their orders; however, we recently found that this feature may result in inconsistent information within the same order, if free text comments contradict information entered through the order template.

We estimated that this problem occurred in approximately 1-out-of-100 medication orders, altogether, but in 1-out -of-20 medication orders with any free-text comments.

# Fighting Both the "Regular" and the New 2009 H1N1 Flu

*Adapted by NCPS staff members Judith Anderson, M.D., Noel Eldridge, M.S., and Joe Murphy, M.S., from an article*
*by Connie Raab, VA Office of Public Health and Environmental Hazards, that appears in the Sept./Oct. 2009* Vanguard, *a VA publication*

Influenza (flu) season seems to be year-round these days. Although "regular" or seasonal flu occurs throughout the fall, winter, and spring, the situation this year is extraordinary.

A new type of flu — previously known as the "swine flu" and now called the 2009 H1N1 flu — was first identified in Mexico in the spring of this year. It quickly spread worldwide and continues to occur in many parts of the world, including the United States.

The rates of flu that we have seen in this country in September and October 2009 appear to be unprecedented in the careers of today's health care workers.

The Veterans Health Administration (VHA), has been getting ready for a situation like this for several years. A depth of experience in planning flu programs and emergency preparedness has paved the way for dealing with the current challenges. The VHA's approach to emergency planning and response has long been recognized and emulated.

After concern in 2003 that the respiratory disease SARS might become a critical problem in the U.S., the Office of Public Health and Environmental Hazards worked across the VHA to start up the "Infection: Don't Pass It On" campaign to promote hand and respiratory hygiene, which NCPS helped develop.

The campaign also began to take on the yearly flu vaccination program, helping to coordinate the VHA's highly successful efforts. The VA rates for both staff and patient vaccination outperform the national data.

VHA's expertise in emergency planning and in flu prevention, along with a collaborative approach across the Department and the field, led to the development of the VA Pandemic Influenza Plan in early 2006. This plan was cited by the White House as a model for agencies to follow.

## Preventing the Flu

Vaccination continues to be the best protection against contracting the flu. The seasonal flu vaccine and the 2009 H1N1 flu vaccine are separate vaccinations. A seasonal vaccine is distributed routinely every year; the H1N1 flu vaccine has just been developed. The seasonal vaccine cannot protect against the 2009 H1N1 flu and the 2009 H1N1 flu vaccine does not replace the seasonal flu vaccine.

It is important to get both vaccinations because the seasonal flu viruses may also circulate this winter in addition to the novel H1N1 virus. The VHA will have supplies of both vaccines, as will local public health departments, community health clinics, and private doctors' offices throughout the country — although availability may be delayed for the 2009 H1N1 vaccine and availability of the seasonal vaccine may be limited. (See your facility's flu coordinator for up-to-date information.)

Besides vaccination, you can help prevent the flu by washing your hands often with soap and water, especially after you cough or sneeze.

Alcohol-based hand sanitizers are also effective for flu. Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it. Avoid touching your eyes, nose, or mouth. Avoid close contact with sick people whenever possible.

Heed your local community health leaders if they request that public events be postponed and stay home when you are ill, especially when you have a fever.

## More Information

Federal site: www.flu.gov.
VA's extensive collection of material on flu and its prevention: www.publichealth.va.gov
Site for the 2009 H1N1 flu: www.publichealth.va.gov/h1n1flu/
Site for VA Pandemic Influenza Plan: www.pandemicflu.va.gov/page.cfm?pg=17
Recommendations on home care from CDC: http://cdc.gov/h1n1flu/guidance_homecare.htm

## "Do I Have The Flu? What Care Should I Get?"

Symptoms of flu are:

- Fever
- Coughing and/or sore throat
- Runny or stuffy nose
- Headaches and/or body aches
- Chills
- Fatigue

In addition, some people may also have gastrointestinal symptoms such as nausea, vomiting, and diarrhea.

One recent VHA project has focused on "self-assessment" tools to help Veterans understand what these symptoms are, whether they might have the flu; and, if so, what care is most appropriate for them.

In many cases, getting cared for at home is all that is needed. This involves rest, drinking fluids, taking fever-reducing over-the-counter medications, and taking other medicines if prescribed. Antiviral drugs are often prescribed for individuals at high risk or with severe flu, and these drugs are on the VA formulary of medications. In some situations — such as pregnancy, the presence of one or more of several chronic health conditions, or having a person at home that no one can care for — patients are advised to call a nurse "advice line" or a health care provider for guidance. There are also several warning signs that indicate that a person should get medical help right away.

For more information about flu assessment and care (and to take an online asssement): www.publichealth.va.gov/h1n1flu

A flow chart to determine high-risk patients and severe flu symptoms is also available from the VA: www.publichealth.va.gov/docs/flu_selfassess_flowchart.pdf

# Use of Color-Coded Wristbands

*By Joe DeRosier, PE, CSP, NCPS program manager*

NCPS does not plan to pursue standardization of color-coded wristbands for falls, do not resuscitate (DNR), or allergies. We prefer prominent labeling, for many reasons.

Approximately 10 percent of the male population has a color perception deficit. Colored wristbands are also worn to support various causes; e.g. yellow for the Lance Armstrong "Live Strong" campaign. (This in mind, it would not be unusual for a patient to show up wearing a colored wristband.)

Readers who have had human factors training on the "Stroop Effect" will understand some of the other problems with color-coding. When a word such as blue, green, red, etc., is printed in a color differing from the color expressed by the word's semantic meaning (e.g., the word "red" printed in blue ink), naming the color of the word takes longer and is more prone to errors than when the meaning of the word is congruent with its ink color.

These factors could result in an adverse event if color-coding – instead of reading a label – is relied upon by staff to identify a specific medical condition.

Some institutions have opted out of standardization programs that rely on color-coding, due to unintended consequences, such as:

A hospital in Pennsylvania submitted a report to the Pennsylvania Patient Safety Reporting System describing an event in which clinicians nearly failed to rescue a patient who had a cardiopulmonary arrest because the patient had been incorrectly designated as "DNR" (do not resuscitate). The source of the confusion was that a nurse had incorrectly placed a yellow wristband on the patient. In this hospital, the color yellow signified that the patient should not be resuscitated. In a nearby hospital, in which this nurse also worked, yellow signified "restricted extremity," meaning that this arm is not to be used for drawing blood or obtaining IV access.[1]

In the unlikely event we were to develop a standardized set of wristbands, we would want them designed not only with different colors, but also with different patterns. For instance, one might be solid; others might have colored dots; still others might have horizontal, vertical, or diagonal colored stripes. This would make the wristbands easier to identify in low lighting conditions or to those with color deficits. We would also want them to include labels that identified the condition.

We would also have to take a close, hard look at exactly what information we would want to convey with the color-coded wristbands. For instance, it makes sense for one to be standing in a doorway and know that a patient across the room is a fall risk. But how important is it to know that a patient is DNR or has an allergy from the doorway of a room?

Wouldn't it make more sense to have the care giver beside the patient, reading the label on a wristband? Especially in an emergency situation?

A brief look at reports available in the NCPS Patient Safety Information System, commonly known as SPOT, indicates problems with current wristbands, such as:

- Fell off patent's wrist
- Removed by patient
- Placed on wrong patient

The same problems could easily develop with color-coded wristbands, regardless of uniform VA-wide color codes for specific conditions, which is why we generally prefer prominent labeling.

## Reference

1. Pennsylvania Patient Safety Reporting System: Patient Safety Advisory. Vol.2, Sup. 2, Dec. 12, 2005.

# Spotlight on Patient Safety and Recalls

*By Stephanie Bergsieker, NCPS program support specialist*

Patient safety alerts and advisories share a Web site with product recalls. In February 2009, an action item was added to each VHA alert and advisory requiring patient safety managers (PSMs) to document alert or advisory actions and recommendations on the Alert and Recalls Web site (see Note 1).

Though the programs share a Web site, members of each program have different duties and responsibilities. For instance, PSMs are *only* responsible for alerts and advisories; facility recall coordinators are responsible for recalls.

Each PSM should be receiving monthly reports (as of July 2009) that provide the status of monthly completion and compliance ratings. These ratings are based on recalls, alerts, and advisories.

The completion rating measures the completion of alerts and advisories for that month. The compliance rating measures timeliness, based on a completion date written in each alert and advisory.

A new Web site for alerts, advisories, and recalls is currently being beta-tested. A roll-out date has not yet been decided upon, but we are eager to provide users with better and more efficient online tools.

## Note

1. VA employees can click to: vaww. nbc.med.va.gov/visn/recalls/index.cfm

http://www.va.gov/ncps/pubs.html#tips

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About 20 percent of the errors we discovered could have resulted in moderate to severe harm, had the pharmacist not intervened.[2]

Monitoring the clarity of communication is necessary to ensure that new solutions to system constraints are safe. An apparent system fix (i.e., adding a free-text data entry field) for one problem, such as inflexibility in the CPOE template, may bring about unintended consequences (e.g., potential for contradictory instructions).

Our work in this area highlights a need to consider communication problems and solutions using a comprehensive approach that includes human factors engineering; however, several potential solutions, such as improved provider education and minor modifications to the CPOE template, are within reach.

## Assuring Follow-up After Information Transfer

Even when information has been transmitted properly, received and acknowledged by the appropriate party, the intended outcome of the communication may not take place. The vulnerable interval between information transmission and follow-up is increasingly recognized as a patient safety priority.

For instance, the Joint Commission National Patient Safety Goals and VHA Directive 2009-019 (Ordering and Reporting Test Results) [3] call upon institutions to establish clear guidelines for reporting test results to providers and patients. Timely follow-up action, such as initiation on further patient work-up, referral to specialty care, or changes to the current treatment plan, is essential for safe care.

*Example:* We recently evaluated communication outcomes of 1,196 alerts related to abnormal diagnostic imaging test results and found 8 percent lacked timely follow-up.

We are exploring strategies to improve follow-up of both abnormal imaging and laboratory test results communicated through CPRS, as well as ways to ensure that providers and patients are safely informed of abnormal findings in need of clinical attention.[4]

Our work also focuses on improving the process of consult request and follow-up through CPRS. We are using a multifaceted approach that takes into account not only technological issues, but also organizational and provider factors that influence how users interact with CPRS.

## Toward Improving Communication

Careful attention to how communication systems function in real-life work environments will help ensure that the best intentions for CPRS-based communication are realized. Although optimizing systems will require a sustained and coordinated effort, some actions can be taken in the short term:

1. Maximize the benefits of what is now available. At our facility, we found that many providers were not aware of the full functionality of the View Alert and CPOE systems. We suspect this may be true at other facilities, as well. Taking advantage of these features could help reduce information overload and streamline communication of clinical data.

2. Revisit policies for consistency and clarity. Recruit feedback from providers and other end-users to make sure that procedures are unambiguous and feasible. This is particularly important when follow-up responsibilities are shared among multiple parties.[1]

3. Monitor the effects of interventions through follow-up reporting to ensure not only that information is transmitted successfully, but also that patient care outcomes are enhanced.

## A Multidisciplinary Approach

Errors in electronic health communication have complex origins and defy easy solutions. Some of the problems of electronic communication, such as role ambiguity and a lack of well-defined protocols, are not entirely new. Other problems, such as information overload and system usability, arise from unique aspects of human–computer interaction.

Multidisciplinary interventions aimed at users, information systems, and organizations, such as ours, are needed to realize the promise of electronic information systems. Our PSCI, "The VA Center of Inquiry to Improve Outpatient Safety Through Effective Electronic Communication," is one of six centers funded by NCPS in 2007.

Since our inception we have conducted over 5,000 medical records reviews, 50 task analyses of several types of VA personnel, and many multidisciplinary focus groups. In the course of our work we have intervened in several patient care situations to prevent patient harm.

Although our work is still ongoing and much remains to be done, we believe this foundational work will have a significant impact on the quality and safety of health care for veterans nationwide.

Contact Donna Espadas for further information about our center: donna.espadas@va.gov

## References

1. Singh H., Thomas E.J., Mani S., et al. Timely Follow-up of Abnormal Diagnostic Imaging Test Results in an Outpatient Setting: Are Electronic Medical Records Achieving Their Potential? *Archives of Internal Medicine*. Preprint.

2. Singh H., Mani S., Espadas D., Petersen N., Franklin V., Petersen L.A. (2009). Prescription Errors and Outcomes Related to Inconsistent Information Transmitted through Computerized Order-Entry: A Prospective Study. *Archives of Internal Medicine*, 169, 982-989.

3. VHA Directive 2009-019, retrived October 7, 2009 from http://www1.va.gov/vhapublications/ViewPublication.asp?pub_ID=1864

4. Hysong S., Sawheny M, Wilson L., et al. Provider Management Strategies of Abnormal Test Result Alerts: A Cognitive Task Analysis. *Journal of the American Medical Informatics Association*. Preprint.