2014 Gage Awards

Reference #	7492126
Status	Complete
Name of hospital or health system	UC Davis Medical Center
Name of project	Can Automated Alerts Improve Compliance with Guidelines for Ordering Pap Tests In Women Under Age 21 and Over Age 71?
CEO name	Ann Madden Rice
CEO approval	Check here to confirm that your CEO approves of this project being submitted for a 2014 Gage Award
Submitter name (first and last)	Khanh-Nhat Tran-Viet
Submitter title	Administrative Fellow
Submitter email	khanh-nhat.tran-viet@ucdmc.ucdavis.edu
Submitter phone	916-734-5043
Project contact person's name (First and Last)	Dr. Lydia Howell
Project contact title	Professor and Chair Department of Pathology and Laboratory Medicine
Project contact email	lydia.howell@ucdmc.ucdavis.edu
Project contact phone	916-734-3330
Within which of the two categories does your application best align?	Quality

1. Provide a brief description of the project. (This section should resemble an abstract for a poster presentation or an abstract for a peer reviewed journal. Include an objective, data sources, study design, findings, and conclusions.)	Introduction: The electronic health record (EHR) provides opportunity to improve health and enhance appropriate test utilization through decision support. Electronic alerts in the order entry system can guide test use, reduce waste, and increase patient safety. Few published reports have assessed the impact of automated alerts on compliance of Pap ordering with published screening guidelines. Methods: Programming rules for Pap test ordering were developed within the EHR (Epic, Madison, WI) of the University of California, Davis Health System using AmericanCollege of Obstetrics and Gynecology's 2009 guidelines and implemented in primary care clinics in 2010. Alerts discouraged Pap orders in women 71 years and displayed when an order was initiated. Providers were not prevented from placing an order. Average Pap tests ordered/month as a percentage of total Pap orders were measured during four time periods: 1) Pre-alert baseline (7/2010-6/2011), 2) Functioning alert (7/2011-12/2011), 3) Inadvertent non-functioning alert (1/2012-12/2012), 5) Reinstatement of alerts (1/2013-7/2013). Results: Alerts were most effective in the 70 year old group in which the average percentage of Pap orders decreased from 2.2% (40/ 1780 total Pap orders/month to 1.6% (22/1347), a relative reduction of 28%. This likely reflects inclusion of women with a history of abnormal Pap tests for whom continued Pap testing is indicated, as well as reluctance by providers and patients to accept discontinuation of Pap testing for women with a history of normal Pap results. In both age groups, decreases in ordering were greatest when the alerts were functioning, indicating that the alerts had an effect beyond the influences of the environment. Conclusions: Discouraging alerts can impact ordering of Pap tests and improve compliance with established guidelines, thus avoiding unnecessary follow-up tests that can create potential patient harm and unnecessary expense. Alerts represent a potential model to address utilization of other lab tests. Continual monitoring is underway to determine compliance maintenance over a longer study interval.

2. Describe the methods use in this project. Include where, why, and how the project was accomplished.	Decision support rules for interruptive alerts to discourage inappropriate Pap test orders were developed by an outside contractor and our local EMR team within the University of California Davis Health System (UCDHS) Epic EMR system. Alerts and other methods of support as part of computerized physician order entry (CPOE) have been identified by the Centers for Disease Control and Prevention as an important method to facilitate provider compliance established laboratory practice guidelines since lack of awareness, unfamiliarity and perceived difficulty in application, inconvenience, cumbersomeness, confusion, lack of a reminder system, and lack of time are all barriers to compliance. For our project, the discouraging alerts for this project were intended to guide Pap test ordering for women under age 21 and over age 70, in accordance with the American College of Obstetrics and Gynecology's 2009 cervical cancer screening guidelines when the when the project was initiated in 2010. The alerts were implemented within UCDHS' primary care clinics, and displayed when an order was initiated for women less than 21 years of age and over age 70 (Figure 1). There was no "hard stop"; in other words, providers were not prevented from placing an order. The metric used to measure impact of the alert was the percentage of the total Pap tests ordered each month that were from women in the under 21 and over 70 year old age group . This percentage was measured for the following four periods: 1) the baseline period before alerts were initiated (July, 2010 through June 2011), 2) a post-alert period following initiation of alerts (July, 2011 through December, 2011), 3) a period in which alerts inadvertently stopped functioning (January, 2012 through December 2012), and 4) a period in which the alerts were re-instated (January, 2013 through July, 2013).

3. Describe the results of the project. What data was used to support improvement results?	Figure 2 illustrates the average monthly percentage of Pap orders in both age groups during the four time periods. During the baseline period, an average of 2.6% (47/1780) Pap tests per month was ordered in patients less than age 21. In the post-alert period, the average monthly percentage from this age group decreased to 1.6% (26/1613), a 38% relative reduction. During the period in which the alert inadvertently stopped functioning, the average percentage of monthly orders in this age group was 1.3% (19/1463), a 20% relative reduction. When the alert was reinstated, an even greater decline was observed with an average monthly percentage of Pap orders of 0.7% (10/1347), a 47% relative reduction over the previous non-functioning alert period. Overall, there was a 73% relative reduction from the baseline period. For the over 70 year old age group, the average monthly percentage of Pap test ordered during the baseline period was 2.2% (40/1780). In the post-alert period, the average monthly percentage decreased to 1.9% (32/1613), a 14% relative reduction. During the period in which the alert inadvertently stopped functioning, the average percentage of monthly orders in this age group remained stable at 1.9%, (28/1463). When the alerts were reinstated, the average monthly percentage of Pap tests ordered was 1.6% (22/1347), a 16% relative reduction over the previous period. Overall, there was a 28% reduction from the baseline period.
3A. Attachment, if applicable (Only graphically displayed data such as charts will be accepted. Data should include baseline and improvement data)	GageAward.Results.Figures.docx (21k)

4. Describe what happened as a result of the project. Was the improvement related to the intervention? Can the project be duplicated by other organizations?	Our interruptive alerts to discourage Pap test ordering in women <21 and 70+ years is an example of an effective IT intervention to support evidence-based practice. We have demonstrated that these alerts can discourage Pap test ordering. Since substantial decreases in the monthly percentage of tests ordered in the age groups of interest occurred when the alerts were functioning, and a lesser decrease was observed during the interval with non-functioning alerts. Though growing provider awareness of Pap test guidelines may have contributed to the decrease in Pap test ordering, the period when alerts inadvertently ceased to function provided a fortuitous opportunity to assess this variable. During the non-functioning alert period, Pap test orders declined by 20% in the <21 age group over the previous functioning alert period, a much smaller reduction than the relative decline before (38%) or after (47%) the non-functioning alert period. In the 70+ group, the non-functioning alert period showed no decline in Pap test ordering. A decline in orders only occurred when alerts functioned, both initially (14% relative reduction over baseline) and after alerts were reinstated (16% relative reduction over the previous non-alert period). The interruptive discouraging alerts clearly influenced compliance with guidelines beyond general awareness of LPGs for Pap testing alone. Alerts had a greater influence on Pap test ordering in women <21 than in those 70+. We speculate that providers may be more comfortable with delaying the start of Pap screening to age 21 than they are with discontinuing screening in older women. Additionally, older women may not be as accepting of discontinuing Pap testing since this test's importance has been strongly emphasized throughout their life. Older patients may pressure providers to perform a Pap, making it difficult for providers to deny this test. Published reports from others have shared that alerts can be irritating to clinical providers since alerts interrupt workflow, create extra steps, and can lead to "alert fatigue" in which individuals pay less attention to all alerts due to habituation. No complaints or negative comments were received by the laboratory or the EMR team when the alerts were initiated or during the time that they have been functioning. Longer monitoring intervals will be necessary to assess the habituation factor and determine if provider compliance is maintained.

5. Describe how patients, families, and if appropriate, community was included in the work.	In summary, our study demonstrates that interruptive alerts can effectively discourage ordering of Pap tests and improve compliance with established laboratory practice guidelines, thus providing the opportunity to avoid unnecessary follow-up tests that can create potential patient harm and unnecessary expense. Our experience with Pap test alerts within computerized physician order entry provides an effective model worthy of consideration for controlling utilization of other lab tests. We encourage other laboratories and healthcare systems to consider this important method as a part of laboratory quality programs.
Last Update	2013-12-15 20:39:24
Start Time	2013-12-15 20:33:51
Finish Time	2013-12-15 20:39:24