

Context Aware workflow compared to traditional alerts for Clinical Decision Support for In Visit Patient Screening

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ABSTRACT

We improved yearly depression screening rates in our outpatient population by using context aware clinical decision support (CDS). We hypothesized that context aware workflow inline decision support would perform better than traditional pop-up driven decision support. In our workflow the PHQ-2 Questionnaire was presented directly into the nursing workflow section of our electronic health record (EHR). Using a rule based mechanism, the PHQ-2 was displayed based on the patient's age, presence or absence of depression diagnosis, and whether the screen had been done in past year. Depression screening rates were compared with the prior year's data which used a traditional pop up based alert to direct the nurses to go to a screening section to complete their task. Rates were also compared to one department that did not move to the new decision support technique.

Introduction

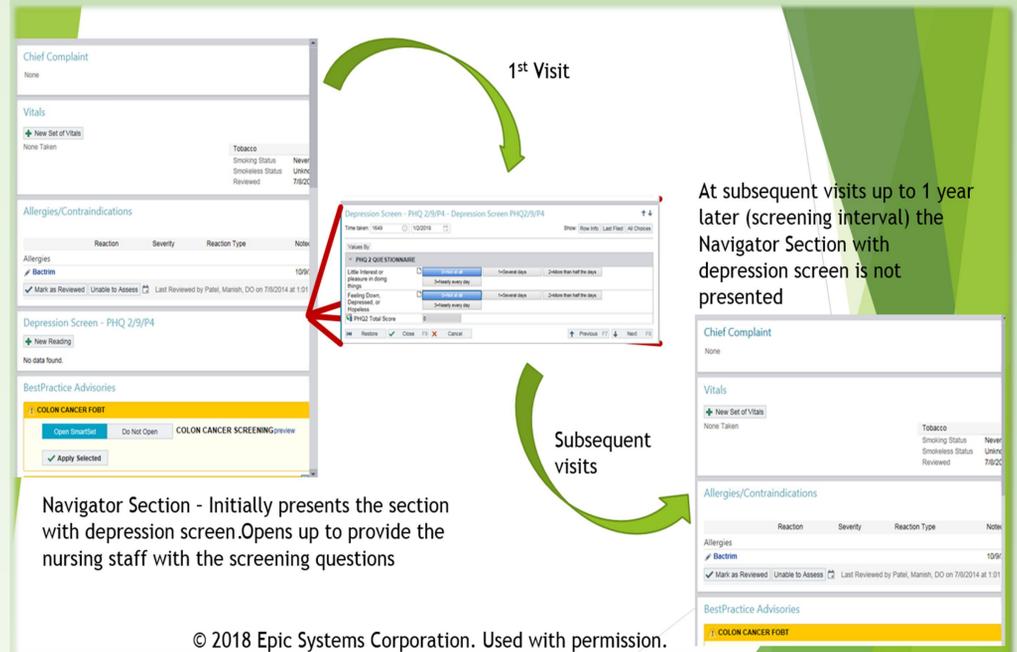
Traditional Patient screening in EHRs has been accomplished by presenting the screening staff, be it nursing or providers, with an alert, interruptive or non-interruptive, reminding the staff to perform the task. Clinicians would then have to go to a screening section of the EHR and perform and record the screen, then resume their prior workflow. Traditional CDS using some form of alert or reminder has been shown in outpatient community settings to have inconsistent results (1). A great deal of work seems to go into getting traditional decision support to be successful (2). We have done some preliminary work in this study demonstrating that context sensitive workflow can quickly improve screening rates without the use a traditional pop up alert system.

Design

Our Traditional Depression Screening involved the staff looking to a Health Maintenance alert section of our EPIC EHR, where an icon would alert them as to the need to perform a depression screen on that patient. They would then open a screening section of the EHR to ask and record the results of the depression screen (PHQ-2). Using a rule that evaluated current patient data combined with a trigger in the EHR navigator section display controls, we set the section that displayed the depression screen to appear based upon the patient's age, whether they had a diagnosis of depression already (these were excluded), and whether a depression screen had been done in the past year. We collected screening data from the entire population of patients seen by 105 providers at 14 of our clinic sites during the 1st week of each month. We used clinical quality measure CMS-2 to determine parameters for our numerator and denominator – both our rule and reporting were based on these specifications.

We compared our screening rates 3 ways – to last year's average screening rate, to 1st quarter prior to improvement in screening rates, and to screening rates in a department that maintained the old workflow. Cohen's *d* was calculated in order to determine the effect size between each comparison.

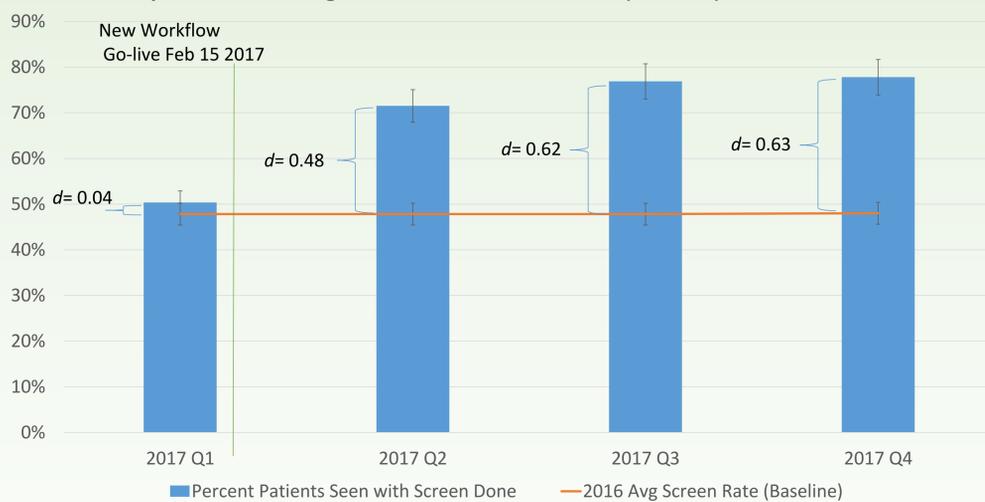
Context Aware Workflow



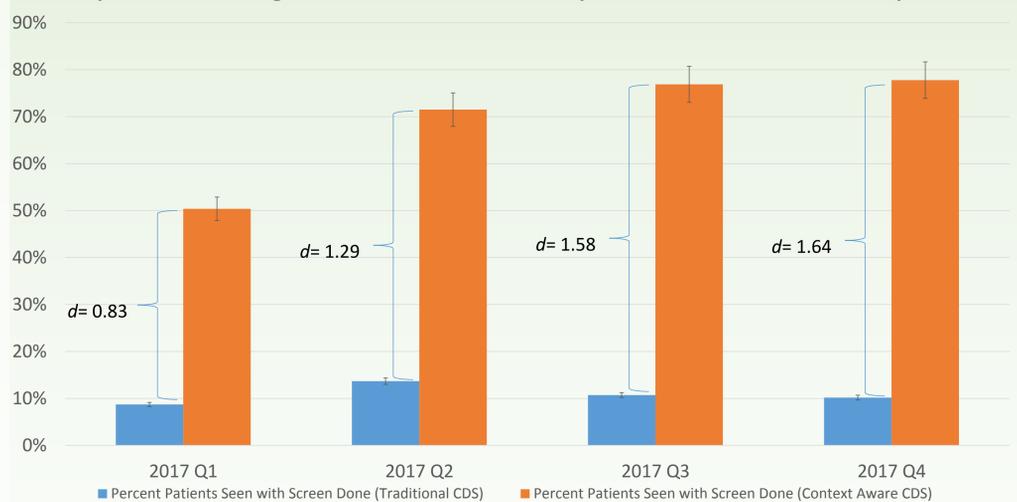
Results

A total of 33,960 eligible patients were seen in 2016. An average of 14,484 eligible patients were seen per quarter in 2017. Effective Screening rates (patients screened who had a visit during the measured time period) were almost immediately improved over rates from 1st quarter of the current year (pre-workflow change) and from the previous year in departments where the traditional CDS were switched to context aware CDS with inline workflow. Effect size (*d*) ranged from small to medium when comparing each quarter with the 2016 baseline. Large effect sizes were found when comparing context aware CDS with traditional CDS across 2017 quarters. The screening rate actually improved with use rather than staying level over 3 quarters of data, suggesting that the improvement was minimally due to education and Hawthorn effect. The lack of improvement in the department that did not switch from context aware CDS supports this conclusion.

Depression Screening Rate For Patients Seen 2016 (baseline) vs Quarters in 2017



Depression Screening Rates: Context Aware CDS Departments vs Traditional CDS departments



Conclusion

Context Aware clinical decision support with inline workflow showed improvement from baseline over traditional CDS both within departments when switched to context aware CDS and in comparison to departments that did not switch to context aware CDS.

Future Work

Implement additional screens with minimal education; show sustained performance in second and third years of screens; compare methods using a cognitive workload scale.

References

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