Electronic screening tool for pneumonia: Performance and utilization

Barbara 13635 Jones barbara.jones@hsc.utah.edu MD 1,2, David 13649 Collingridge david.collingridge@imail.org 2, Al 13650 Jephson al.jephson@imail.org 2, Jeffrey 13651 Ferraro jeff.ferraro@imail.org 3, Kumar 28019 Mynam kumar.mynam@imail.org , Peter 13653 Haug peter.haug@imail.org MD 3, Herman 13652 Post herman.post@imail.org 3, Caroline 13654 Vines caroline.vines@imail.org MD 4,5, Todd 13655 Allen todd.allen@imail.org MD 4 and Nathan 13656 Dean nathan.dean@imail.org MD 1,2. 1 Pulmonary and Critical Care Medicine, University of Utah, Salt Lake City, UT, United States, 84152 ; 2 Pulmonary and Critical Care Medicine, Intermountain Medical Center, Murray, UT, United States, 84157 ; 3 Homer Warner Department of Bioinformatics, Intermountain Medical Center, Murray, UT, United States, 84157 ; 4 Emergency Medicine, Intermountain Medical Center, Murray, UT, United States, 84157 and 5 Emergency Medicine, University of Utah, Salt Lake City, UT, United States, 84152.

RATIONALE: We developed a real-time electronic screening tool that identifies patients with pneumonia in the emergency department (ED) using the electronic medical record. Our aim was to evaluate performance and compare utilization rates 6 months after tool initiation. METHODS: Our screening tool uses Bayesian logic to combine electronically recorded clinical data with a natural language program that identifies evidence of pneumonia within radiographic reports. Once a patient is identified, the ED physician can confirm the diagnosis then proceed with a decision support tool for management recommendations. In 4 EDs located in Salt Lake City, among all patients obtaining a chest radiograph for the periods of May 5-Jul 10 2011, and Oct 1-Dec 31 2011, a random selection of 300 as well as 60 tool-positive patient records was evaluated by three physician authors for clinical and radiographic evidence of pneumonia. Sensitivity and specificity compared to physician review, ED physician acknowledgment, and tool utilization were evaluated. RESULTS: 13,859 patients had chest imaging done; the rate of pneumonia was 8.2%. Sensitivity was .74, and positive predictive value .51. Among the true- positive cases, ED physicians' recognition and agreement with the tool alert showed a non-significant increase from 37% (15/41) to 53% (21/40) (p=.22). Of all true pneumonia cases, utilization of the decision support tool increased significantly, from 12% (6/49) to 48% (29/60) (p=.004). CONCLUSION: Our electronic screening tool demonstrated moderate sensitivity and positive predictive value compared to physician review. Physician recognition and usage increased over time.