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CDS Hooks: Integrating Decision Support at the Point of Care (Part 2)

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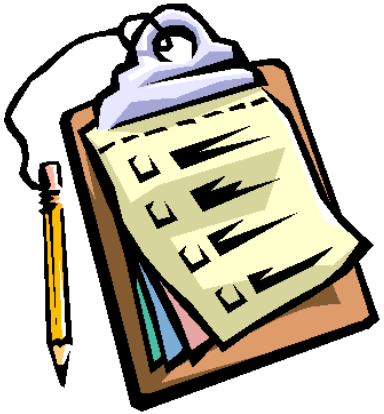
Agenda – April 18 - 10:25 - 10:50 am

- Part 2
  - Discussion Zone: Example Scenarios
  - Recommended Tools / Reading
  - Questions/Answers



Agenda

We will review four CDS published cases and discuss how they can be implemented using CDS-HOOKS

1) **Reducing Unnecessary Tetanus Immunization** in the ED
2) **Increase Seasonal Influenza Vaccination** Among Hospitalized Children Before Inpatient Discharge
3) Decision Support System to **Identify and Manage Opioid Use Disorder**
4) Artificial intelligence-assisted clinical decision support for **childhood asthma management**

and finally,,, we will discuss **Da Vinci PDEX CDS-Hooks**

1- Reduction of unnecessary Tetanus immunization

Abstract

Study objective: Tetanus is the most common vaccination given in the emergency department; yet, administrations of tetanus vaccine boosters in the ED may not comply with the US Centers for Disease Control and Prevention's recommended vaccination schedule. We implemented a clinical decision support alert in the electronic health record that warned providers when ordering a tetanus vaccine if a prior one had been given within 10 years and studied its efficacy to reduce potentially unnecessary vaccines in the ED.

Methods: This was a retrospective, quasi-experimental, 1-group, pretest-posttest study in 3 hospital EDs in Boston, MA. We studied adult patients for whom tetanus vaccines were ordered despite a history of vaccination within the prior 10 years. We compared the number of potentially unnecessary tetanus vaccine administrations in a baseline phase (when the clinical decision support alert was not visible) versus an intervention phase.

Results: Of eligible patients, 22.1% (95% confidence interval [CI] 21.8% to 22.4%) had prior tetanus vaccines within 5 years, 12.8% (95% CI 12.5% to 13.0%) within 5 to 10 years, 3.8% (95% CI 3.6% to 3.9%) more than 10 years ago, and 61.3% (95% CI 60.9% to 61.7%) had no prior tetanus vaccination documentation. Of 60,983 encounters, 337 met the inclusion criteria. A tetanus vaccination was administered in 91% (95% CI 87% to 96%) of encounters in the baseline phase, compared to 55% (95% CI 47% to 62%) during the intervention. The absolute risk reduction was 36.7% (95% CI 28.0% to 45.4%), and the number of encounters needed to alert to avoid 1 potentially unnecessary tetanus vaccine (number needed to treat) was 2.7 (95% CI 2.2% to 3.6%). For patients with tetanus vaccines within the prior 5 years, the absolute risk reduction was 47.9% (95% CI 35.5 % to 60.3%) and the number needed to treat was 2.1 (95% CI 1.7% to 2.8%).

Conclusion: A clinical decision support alert that warns ED clinicians that a patient may have an up-to-date tetanus vaccination status reduces potentially unnecessary vaccinations.

Hook?

Resources?

Cards?

- **Indicator: Critical / Warning / Info**
- **Type:**
  - Information
  - Suggestion (Action? Accepted?)
  - App Link

Clinical Decision Support Reduces Unnecessary Tetanus Vaccinations in the Emergency Department
Ann Emerg Med. 2021 Sep;78(3):370-380
Department of Emergency Medicine, Massachusetts General Hospital, Boston, MA; Massachusetts General Brigham Digital Health, Boston, MA; Harvard Medical School
Dutta S, McEvoy DS, Stump T, McCabe J, Mahendra-Rajah A, McMurry R, White BA, Rubins D

2- Improve Pediatric Seasonal Influenza Vaccination

Key Points

Go to:

Question

Is a clinical decision support (CDS) strategy associated with improved influenza vaccination rates before discharge among eligible hospitalized children?

Findings

In this quality improvement study, the combinination of a default-checked influenza vaccine order in admission order sets for eligible patients with a nursing script using a presumptive strategy to offer the vaccine was associated with significantly higher odds of the hospitalized child receiving the influenza vaccine compared with concurrent and historical controls.

Meaning

This study suggests that a user-centered CDS strategy may improve vaccination rates among vulnerable, hospitalized children.

Abstract

Go to:

Importance

Hospitalized children are at increased risk of influenza-related complications, yet influenza vaccine coverage remains low among this group. Evidence-based strategies about vaccination of vulnerable children during all health care visits are especially important during the COVID-19 pandemic.

Objective

To design and evaluate a clinical decision support (CDS) strategy to increase the proportion of eligible hospitalized children who receive a seasonal influenza vaccine prior to inpatient discharge.

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Evaluation of a Clinical Decision Support Strategy to Increase Seasonal Influenza Vaccination Among Hospitalized Children Bef ore Inpatient Discharge

Evan W. Orenstein, MD,corresponding author1,2,3 Omar ElSayed - Ali, MD,4 Swaminathan Kandaswamy, PhD,1 Erin Masterson, MPH,2 Reena Blanco, MD,1,5 Pareen Shah, MD,1,5 Patricia Lantis, MD,1,2 Amy Kolwaite, MS, MPH,5,6 Thomas E. Dawson, PharmD,2 Edwin Ray, RN,2 Christy Bryant, RN,2 Srikant Iyer, MD, MPH,1,5 Andi L. Shane , M D, MPH, MSc,1,7 and Stephanie Jernigan, MD1,8

3- DSS to Identify and Manage Opioid Use Disorder

A pilot study of the functionality and clinician acceptance of a clinical decision support tool to improve primary care of opioid use disorder

Rebecca C Rossom [1 2], JoAnn M Sperl-Hillen [3], Patrick J O'Connor [3], A Lauren Crain [3], Laurel Nightingale [3], Anne Pylkas [4 5], Kristen V Huntley [6], Gavin Bart [7 8]

Affiliations + expand

PMID: 34130758 PMCID: PMC8207778 DOI: 10.1186/s13722-021-00245-7

Free PMC article

Abstract

Objective: Most Americans with opioid use disorder (OUD) do not receive indicated medical care. A clinical decision support (CDS) tool for primary care providers (PCPs) could address this treatment gap. Our primary objective was to build OUD-CDS tool and demonstrate its functionality and accuracy. Secondary objectives were to achieve high use and approval rates and improve PCP confidence in diagnosing and treating OUD.

Methods: A convenience sample of 55 PCPs participated. Buprenorphine-waivered PCPs (n = 8) were assigned to the intervention. Non-waivered PCPs (n = 47) were randomized to intervention (n = 24) or control (n = 23). Intervention PCPs received access to the OUD-CDS, which alerted them to patients at potentially increased risk for OUD or overdose and guided diagnosis and treatment. Control PCPs provided care as usual.

Results: The OUD-CDS was functional and accurate following extensive multi-phased testing. PCPs used the OUD-CDS in 5% of encounters with at-risk patients, far less than the goal of 60%. OUD screening confidence increased for all intervention PCPs and OUD diagnosis increased for non-waivered intervention PCPs. Most PCPs (65%) would recommend the OUD-CDS and found it helpful with screening for OUD and discussing and prescribing OUD medications.

Discussion: PCPs generally liked the OUD-CDS, but use rates were low, suggesting the need to modify CDS design, implementation strategies and integration with existing primary care workflows.

Conclusion: The OUD-CDS tool was functional and accurate, but PCP use rates were low. Despite low use, the OUD-CDS improved confidence in OUD screening, diagnosis and use of

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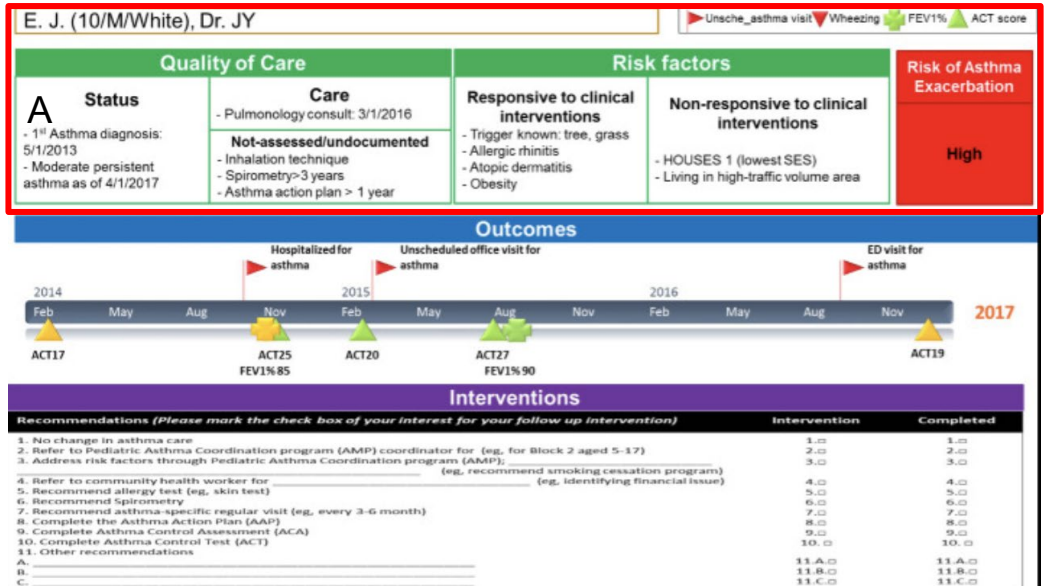
4- AI-assisted CDS for childhood asthma management



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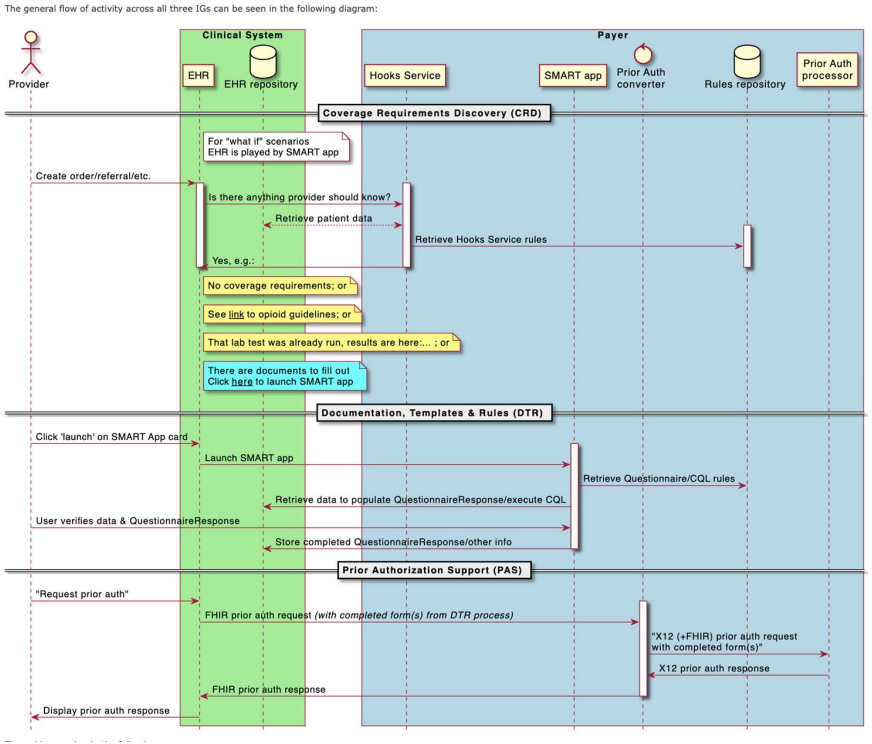
Artificial intelligence - assisted clinical decision support for childhood asthma management: A randomized clinical trial

Hee Yun Seol[1,2], Pragya Shrestha[1,3], Joy Fladager Muth[3], Chung-Il Wi[1,3], Sunghwan Sohn[4], Euijung Ryu[5], Miguel Park[6], Kathy Ihrke[1,3], Sungrim Moon[4], Katherine King[5], Philip Wheeler[1], Bijan Borah[7], James Moriarty[8], Jordan Rosedahl[8], Hongfang Liu[4], Deborah B McWilliams[3], Young J Juhn[1,3]

5- Da Vinci PDEX CDS-Hooks



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https://build.fhir.org/ig/HL7/davinci - crd/hooks.html#cds - hooks

More on CDS-Hooks

- The Standard
  - https://cds-hooks.hl7.org/2.0/
- The Classical Tutorial
  - https://github.com/cerner/code-learning-lab/blob/main/cds-hooks/Remote%20Decision%20Support%20with%20CDS%20Hooks.pdf
- The Sandbox
  - https://sandbox.cds-hooks.org/
- Example Source Code
  - https://github.com/diegokaminker/ueho-cdshooks

Questions and Conclusions

- Questions?