**Maine Medical Center**

**Department of Emergency Medicine**

**Journal Club Summary Template**

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| **Date:8/17/2017** | **Presenter Name: thomas jarrett, MD, PhD** |
| **Article Citation:** Volz; etal. Identifying patients with cellulitis who are likely to require inpatient admission after stay in an ED observation unit. *American Journal of Emergency Medicine.*  2013. 70:581-586 | |
| **Country(ies):** USA | |
| **Funding Source(s):**  None Stated | |
| **Purpose** | |
| **Research Question(s):**  None Stated | |
| **Hypotheses:**  None Stated | |
| **Study Purpose:** Because it remains unclear which characteristics can reliably predict which patients with cellulitis require prolonged hospitalization, this study was designed to identify characteristics in patients with cellulitis that are predictive of ED observation unit (EDOU) failure. | |
| **Methods** | |
| **Study Design:** Retrospective cohort study | |
| **Outcome(s) *[or Dependent Variable]:*** EDOU discharge to home, Inpatient admission | |
| **Intervention *[or Independent Variable]:*** Age, sex, history of diabetes, intravenous drug use, presence of HIV/AIDS, use of immunocompromising medications, subjective history of fever, location of cellulitis, previous treatment with oral antibiotics, type of antibiotics received in EDOU, ED stay vitals signs, white blood cell count, lactate level, abcess incision and drainage, patient treated with MRSA appropriate antibiotics (trimethoprim-sulfamethoxazole, doxycycline, or clindamycin) outpatient, patient treated with outpatient antibiotics. | |
| **Ethics Review:**  IRB Review  IACUC Review  Other:  None Stated | |
| **Research Setting:** United States urban academic center with an ED with 55,000 annual visits in 2009-11. In a state with universal health care**.** With an EDOU with volume of 5,600 patients a year. | |
| **Study Subjects:** Consecutive charts of adult patients presenting to ED by any arrival method. | |
| **Inclusion Criteria:** Age > 18 years of age, ICD-9 Code of cellulitis or skin infection, Date of service 8/2009-5/2011, admitted to the EDOU | |
| **Exclusion Criteria:** Discharged without admission to EDOU or hospital, admitted to hospital without EDOU admission, primary EDOU placement was for reason other than cellulitis, chart was missing data, no IV antibiotics given while in ED or EDOU, left against medical advice, patient eloped, patient was transferred | |
| **Study Interventions:** None. Observational study. | |
| **Study Groups:** EDOU charts discharged to home and EDOU charts subsequently admitted to hospital | |
| **Instruments/Measures Used:** see “Intervention [or Independent variable]:” | |
| **Data Collection:** Trained reviewers reviewed each chart. In addition to listed dependent and independent variables above being collected from each chart, when available, following data was also abstracted: presence of crepitus, bullae, size of cellulitis, and length of symptoms. To qualify as treated with outpatient antibiotics prior to ED arrival patient had to be treated with an antibiotic reviewers agreed was an agent that had known activity towards typical skin infection flora. | |
| **Data Analysis:**  ***A priori* sample size calculation?**  Yes  No  Not Described  N/A  **Statistical analyses used:** Descriptive statistics including confidence intervals (Cis) where appropriate were calculated. Continuous variables were turned into dichotomized variables at accepted cutoffs a priori. Initially, a univariate analysis was completed comparing admission rates for each variable of interest using Fisher exact test, t test, or Wilcoxon rank sum, as appropriate. Variables with unadjusted univariate significance of at least 0.2 were eligible for inclusion into the multivariate model. Multivariate model: stepwise, forward selecting, multivariate logistical regression model, which retained covariates reaching a P < .05. Previously published peer-reviewed methods for adjusting for missing data were used. Area under the receiver operator characteristic curve was used as a measure of model accuracy.  **Adjustment for potential confounders?**  Yes  No  Not Described  N/A  **If yes, list:** | |
| **Results** | |
| **Study participants:** 406 patients with a diagnosis of skin infection/cellulitis were identified. 29 were excluded (reasons:10 in observation for non-skin reasons but also had a cellulitis diagnosis, 8 did not receive IV antibiotics, 5 erroneously admitted to EDOU, 5 left AMA/eloped/transferred, 1 missing chart). No difference in admitted to hospital and discharged to home groups on age, sex, IVD, history of diabetes, or immunocompromised status. | |
| **Brief answers to research questions *[key findings]:*** Predictors identified in multivariate logistical regression model used that led to EDOU patients falling to be discharged to home at end of EDOU stay and requiring admission to hospital at that time include:   * cellulitis of the hand (odds ratio [OR], 2.9; 95% confidence interval [CI], 1.8-4.9) * measured temperature higher than 100.4°F (OR, 2.5; 95% CI, 1.1-5.5) * lactate greater than 2 (OR, 3.1; 95% CI, 1.3-7.3) | |
| **Additional findings:** The model demonstrated only fair discrimination with an area under the receiver operating characteristic curve of 0.65. Following were not found to be a predictor of failing EDOU treatment: age, sex, diabetes, immunosuppression, IVDU, presence of abscess, elevated WBC count, patient history of fever, blood pressure lower than 100, or prior course of PO antibiotics. | |
| **Limitations:**   * Enrollment bias (retrospective study design) * Incomplete records * Did not follow patients that returned to ED within 24 hours for same complaint. * Single site study design | |
| **Clinical Implications** | |
| **Applicable?** Moderately applicable for ED’s with EDOU’s in states with universal health care. Reasons study is only moderately applicable and only to this small subset of ED’s is populations with universal healthcare is multi-faceted. States with universal healthcare have fewer individuals that present to ED with skin infections with a mixed picture of either advanced localized infections or early signs of systemic disease. Overall skin infection case mix presenting to the ED in this study with a skin infection that meets some criteria for inpatient admission but other criteria for discharge to home could be lower than states without universal healthcare. There are more options for close outpatient follow up after EDOU discharge in states with universal healthcare as well. Risk of patients re-presenting to ED in relapse and with florid systemic disease are lower than in states without universal healthcare. Study did not capture data on patients who returned to ED after an EDOU stay or hospital admission with recurrence. The number of patients return after either EDOU or inpatient stays is the population ED physicians are most concerned about of their patients with more serious skin infections that they are considering EDOU stay or full admission for. This study did not look at or comment on this vital subset of their study population. Beyond the limitations of this study being done at one site and in a state with universal healthcare the model only had moderate predictive value with area under curve of receiver operating characteristic curve of 0.65. Being a one center design and not from a center where there is not universal health care the applicability of this study may be much lower for ED’s in states without universal healthcare. However the literature on cellulitis and EDOU’s is far from complete and there are no similar designed studies in states without universal healthcare at the time this article was written or this article was discussed at journal club.  **Feasible?** Very feasible to implement into EDOU admission protocols for cellulitis if findings can be demonstrated in a prospective randomized multi-site study design  **Clinically relevant?** Not relevant considering how much of US population lives outside of states with universal health care and how low the area under the curve of receiver operating characteristic curve was.  **Comments:** No additional comments. | |
| **Level of evidence generated from this study** | |
| III: evidence obtained from a well-designed, non-experimental study | |
| **Additional Comments/Discussion/Notes** | |
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