Critical Review Form
Prognosis

Schrager J, Wheatley M, Georgiopoulou V, Osborne A, Kalogeropoulos A, Hung O, Butler J, Ross M. Favorable bed utilization and readmission rates for emergency department observation unit heart failure patients. Acad Emerg Med. 2013 Jun;20(6):554-61.

Objectives: **"to compare 30- and 90-day readmission rates and resource utilization among patients admitted to the hospital or discharged home following treatment for AHF [acute heart failure] in the OU [observation unit]." (p. 555)**

Methods: **This retrospective cohort study was conducted at Emory University Hospital and Emory University Hospital Midtown between October 1, 2007 and June 30, 2011. Patients with decompensated AHF admitted to the OU at either hospital were identified from a prospective database. Patients were admitted to the OU at clinician discretion, based on inclusion and exclusion criteria outline in an accelerated treatment protocol (ATP), which was also used to guide management and disposition decision. Management included "cardiac monitoring, serial laboratory testing, clinical reevaluations, scheduled diuretics, and nitrates." (p. 555)**

Two independent, trained abstractors who were blinded to eventual disposition of the patient, performed data abstraction using a standard abstraction form. In addition to clinical and demographic patient information, abstractors also recorded disposition (discharge from the OU or admission to the hospital). Readmission rates were evaluated at 30 and 90 days, and were confirmed as being heart failure related by two independent clinicians. The primary comparison was the initial disposition of the patient (discharge from the OU vs. admission).

A total of 358 records were reviewed, of whom 31 were excluded due to having diagnoses other than heart failure, leaving 327 patients in the final analysis. The mean age was 59.6 years and 53.5% were males. The final disposition was hospital admission in 88 (26.9%) patients and discharge home in 239 (73.1%) patients.

Guide		Comments
I.	**Are the results valid?**	
A.	**Was the sample of patients representative?** *In other words, how were subjects selected and did they pass through some sort of "filtering" system which could bias your results based on a non-representative sample. Also, were objective criteria used to diagnose the patients with the*	No. The study examined all patients admitted to the OU at either of the hospitals with a final diagnosis of decompensated AHF. Diagnosis was confirmed by two independent clinicians, though it is unclear if any objective criteria were used to make this determination.

<table>
<tr><td></td><td>disorder?</td><td></td></tr>
<tr><td>B.</td><td>Were the patients sufficiently homogeneous with respect to prognostic risk?
In other words, did all patients share a similar risk from during the study period or was one group expected to begin with a higher morbidity or mortality risk?</td><td>Yes, although patients admitted to EUHM were significantly more likely to be admitted to the hospital than patients at EUH (32.1% vs. 21.4%; p = 0.0283).</td></tr>
<tr><td>C.</td><td>Was follow-up sufficiently complete?
In other words, were the investigators able to follow-up on subjects as planned or were a significant number lost to follow-up?</td><td>Uncertain. The authors not that follow-up ended at death, readmission, or the end of the study period, but they only assessed hospital readmission to one of the two study hospitals. They may have missed additional readmissions to non-study hospitals.</td></tr>
<tr><td>D.</td><td>Were objective and unbiased outcome criteria used?
Investigators should clearly specify and define their target outcomes before the study and whenever possible they should base their criteria on objective measures.</td><td>Yes. The outcome criteria were death, duration of hospital stay (in hours), and need for hospital readmission. These criteria were well-defined and are not subject to interpretation.</td></tr>
<tr><td>II.</td><td>What are the results?</td><td></td></tr>
<tr><td>A.</td><td>How likely are the outcomes over time?
For the defined follow-up period, how likely were subjects to have the outcome of interest.</td><td>

Of the cohort of 327 patients, 88 (26.9%) were admitted to inpatient units and 239 (73.1%) were discharged home from the OU.
Admitted patients had higher overall BNP, BUN, and creatinine levels compared to those discharged home, and the median LVEF was lower in admitted patients (see table).

Table. Values in admitted and discharged patients
<table>
<tr><td></td><td>Admitted</td><td>Discharged</td></tr>
<tr><td>BNP (pg/mL)</td><td>1063
(552 to 2067)</td><td>708
(254 to 1683)</td></tr>
<tr><td>BUN (mg/dL)</td><td>19
(14 to 26)</td><td>17
(13 to 23)</td></tr>
<tr><td>Creat (mg/dL)</td><td>1.3
(1.1 to 1.6)</td><td>1.2
(0.9 to 1.4)</td></tr>
<tr><td>LVEF (%)</td><td>22.5
(15 to 43)</td><td>35
(20 to 55)</td></tr>
<tr><td colspan="3">Values reported as medians with interquartile ranges</td></tr>
</table>

ED LOS and OU LOS were similar in patients eventually admitted and discharged from the OU.
Patients discharged from the OU had significantly fewer median inpatient bed days at 30 days (1.7, IQR 0.0-5.1; vs. 3.5, IQR 2.3-5.8) and 90 days (1.8, IQR 1.1-6.0; vs. 4.0,

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		IQR 2.8-6.8). Readmission rates were similar between those admitted and discharged from the OU at 30 days (12.5% vs. 10%, p = 0.52; HR = 1.28; 95% CI = 0.63 to 2.62) and 90 days (27.3% vs. 21.8%, p = 0.30; HR = 1.33; 95% CI = 0.82 to 2.16).
B.	**How precise are the estimates of likelihood?** *In other words, what are the confidence intervals for the given outcome likelihoods?*	See above.
III.	**How can I apply the results to patient care?**	
A.	**Were the study patients and their management similar to those in my practice?**	Yes and no. This study was conducted at two separate hospitals in Atlanta, one urban and one community-based. As Atlanta also has a county hospital that sees many of the underinsured patients in the city, it is likely that this population is underrepresented in the study. Clinically, these patients were very likely to be similar to patients we see with CHF.
B.	**Was the follow-up sufficiently long?**	Yes. The authors evaluated readmission rates out to 90 days, which should be sufficiently long.
C.	**Can I use the results in the management of patients in my practice?**	No. While this study is interesting and does suggest some possible means of differentiating patients who will require admission from those who will successfully be discharged from the OU, it is not yet possible to use this information to create an algorithm or clinical decision rule. Further research will need to clarify how to use this data clinically. What this paper does suggest is that use of an OU algorithm for treating select ED patients will result in a majority of those patients going home without requiring hospital admission, and may result in decreased healthcare usage.

Limitations:

1. **The authors did not make any attempt to contact patients to determine if readmission occurred at another hospital during the study period.**
2. **This was a very small study with limited numbers, and hence limited ability to identify predictors.**

3. **Patients admitted to the OU in the study were selected and managed using a strict protocol. In the absence of a such a protocol, the results may not be generalizable.**

<u>Bottom Line:</u>

This small, retrospective cohort study demonstrated that patients discharged from the OU of two Atlanta area hospitals were no more likely to require hospital readmission at 30 or 90 days than those admitted to the hospital from the OU. Patients discharged from the OU also used overall few hospital bed-days. This also demonstrated that patients admitted from the OU had overall higher BNP, BUN, and creatinine values and lower ejection fractions. Use of these data may eventually aid us in differentiating patients that are more likely to be successfully discharged from the OU from those who will likely require admission.