

Should patients coming to the emergency department with chest pain always be admitted to the hospital?

Impact of hospital status on outcomes and utilization among ED patients with chest pain

Evidence and practice landscape



Chest pain is the second most common cause for emergency department (ED) visits in the US, accounting for over 8 million visits a year. Even patients who show a very low risk for heart attack are often admitted for observation and cardiac testing in order to monitor symptoms that may take time to present.

Studies have demonstrated great variation in hospital admission rates for chest pain between emergency physicians and hospitals – largely due to differences in risk tolerance, concerns about missed diagnoses and local practice patterns. Most EDs have protocols for managing patients with chest pain, including risk calculators, but they are not always widely used. It is possible these tools do not provide the proper guidance to make informed decisions that are best for individual patients.

In recent years, public attention

has turned to increasing numbers of patients who are “hospitalized but not admitted.” In this scenario, patients are treated under observation – rather than admitted as inpatients – to manage costs and resources. While patients admitted for observation are technically considered outpatients, observation care can be provided in a regular hospital floor bed or in a specific area of the ED. This makes it difficult for patients to know if they have been admitted and if it will impact the care and costs they receive. The value of care provided to patients under observation in comparison to inpatients is a broad question.

This study evaluates trends in hospital admissions and care for patients who come to the ED with chest pain – and the impact of hospital status and testing on their health outcomes.

Key insight

Many people with chest pain can be safely sent home from the emergency department without needing to be admitted for costly hospitalization.

- Patients admitted to the hospital as inpatients received more tests and procedures around their chest pain than patients placed under observation but not admitted.
- Despite receiving more care, inpatients had a similar low rate of a heart attack in the next 30 days as observation patients.
- There is an opportunity to investigate whether care may be overutilized for inpatients or underutilized for observation patients, or if these populations are different despite the matching methods applied in this study.
- Results suggest the need for ongoing discussions about the role, value and quality of care in observation vs. inpatient hospital treatment.

Translation thinking

Researchers are developing shared decision aids to help providers explain heart attack risk to patients with chest pain in the ED and engage patients in choosing the next step in care that is right for them.

[Click to learn about Chest Pain Choice by Mayo Clinic.](#)

This study addresses issues of importance to:

- **Patients** with chest pain who are concerned about their risk of heart attack, as well as how the hospital care they receive will drive the tests and out-of-pocket costs they endure.
- **Providers** treating patients with chest pain, or who may be asked by patients about their heart attack risk, hospital status and what to expect in terms of treatment and costs.
- **Payers and policy makers** who determine and evaluate quality measures and financial performance related to hospital care via ED, observation and inpatient levels of care.

Project mechanics

Objectives

- Compare health care utilization among patients coming to the ED with chest pain and (1) admitted to the hospital as a short-term inpatient stay (≤ 2 days), (2) placed under observation (in ED observation units or in-hospital observation), or (3) discharged home.

Study population

- A total of 2,013,731 ED visits were recorded for chest pain among Medicare Advantage and commercially insured enrollees during the study period of 2010-2014.
- 774,017 patients were included in this study – adults 18 years or older with continuous health plan enrollment 12 months prior and 31 days after coming to the ED with acute chest pain between 2010 – 2014 . Patients were excluded if they had a heart attack during the index ED visit.

Methods

- Retrospective analysis using the OptumLabs Data Warehouse, which includes administrative claims data on over 130 million Medicare Advantage and commercially insured enrollees.
- One-to-one propensity-score matching in three separate models – (1) observation vs short inpatient stay, (2) observation vs discharged home, (3) short inpatient stay vs discharged home – to account for selection bias between the groups.
- Logistic regression models using the matched samples to identify associations; odds ratios (ORs) with 95% confidence intervals (CIs) were reported.

*Concepts to know

Acute myocardial infarction (AMI): also known as a heart attack, which occurs when blood flow to the heart is blocked by a build-up of fat or cholesterol in the heart arteries.

Cardiac catheterization: procedure used to diagnose and treat heart artery blockages. A long thin tube is inserted in an artery or vein in the groin, neck or arm and threaded through blood vessels to the heart. Doctors can then do diagnostic tests and some heart disease treatments, such as coronary angioplasty.

Percutaneous coronary intervention (PCI): a procedure used to open clogged heart arteries. Also known as angioplasty, it involves temporarily inserting and inflating a tiny balloon where your artery is clogged to help widen the artery and sometimes place a stent.

Key findings

The incidence of a heart attack within 30 days after discharge was low among patients who went to the ED for chest pain overall.

- Similar in observation vs. short inpatient stays: 0.23% vs. 0.21%, OR 1.09 (0.84-42).

Patients admitted to the hospital for short inpatient stays received more tests and treatments than patients placed under observation.

- For example. there were more cardiovascular procedures for inpatients compared to those treated under observation:
 - Cardiac catheterization*: 24.4% vs. 10.9%, OR 0.38 (0.36-0.39)
 - Percutaneous coronary intervention (PCI)*: 7.6% vs. 1.8%, OR 0.23 (0.21-0.24).

Readmissions were higher among patients admitted to the hospital for a short inpatient stay compared to those placed under observation.

- Readmissions for short stay inpatients compared to observation patients: 5.9% vs. 4.9%, OR 0.82 (0.78-0.87).

Study limitations

- Administrative claims are susceptible to coding errors, such as under-coding comorbidities or outcomes.
- Like all observational comparative effectiveness studies, the study is limited by lack of randomized treatment allocation which could introduce bias based on clinical factors that impact the hospital status in which a patient is placed (observation vs inpatient vs discharged home).
- Due to limitations in the data source at the time of the data extraction, we did not evaluate the cost of interventions nor were we able to evaluate the number of hours spent in the ED or if the observation was performed in an ED observation unit or on the hospital floor.
- This is not a true national sample and is limited to privately insured and Medicare Advantage enrollees. Findings may not easily generalize to Medicaid, Medicare fee-for-service, or uninsured populations.

Driving discovery

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Mayo Clinic is a nonprofit organization committed to clinical practice, education and research, providing expert, whole-person care to everyone who needs healing. For more information, visit <http://www.mayoclinic.org>.

This study was conducted in collaboration with AARP, a nonprofit, nonpartisan organization with a membership of more than 37 million. AARP helps turn their goals and dreams into real possibilities; strengthens communities; and fights for the issues that matter most to families, such as health care, employment and income security, retirement planning, affordable utilities and protection from financial abuse. For more information, visit <http://www.aarp.org>.

OptumLabs™ is an open collaborative research and innovation center co-founded by Optum and Mayo Clinic, and later joined by AARP as founding consumer advocate organization in late 2013. Our mission is to accelerate improvements in patient care and value through clinical, policy and product innovation driven by new insights from big data. For more information, visit <https://www.optumlabs.com>.

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Sources

Bellolio MF, Sangaralingham LR, Schilz SR, et al. [Observation or inpatient: Impact of patient disposition on outcomes and utilization among emergency department patients with chest pain](#). Academic Emergency Medicine. 2016 Oct [Epub ahead of print].

Mayo Clinic. Patient Care & Health Information website <http://www.mayoclinic.org/diseases-conditions/heart-attack/basics/definition/con-20019520>. Updated November 15, 2014. Accessed July 2016. Learn more a

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