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## PROBLEM

Several studies have examined infection rates in patients with open fractures and have determined that longer times to administration of antibiotics are correlated with increased rates of infection.

TQIP orthopedic trauma best practice guidelines include a metric of  $\leq 60$  minutes from time of Emergency Department (ED) arrival to administration of the first dose of antibiotics for open fractures.

We determined that patients with open fractures at our Level I trauma center were frequently not receiving antibiotics within 60 minutes of ED arrival.

## INTERVENTION

Initial education regarding the importance of the time to prophylactic antibiotics for patients with open fractures was presented to the ED and trauma physicians

An orthopedic open fracture work group was formed and the decision was made to change the institutional order set policy for open fractures

Original policy:

- Cefazolin for grade I and II open extremity fractures
  - Clindamycin for grade I and II open extremity fractures with penicillin or cephalosporin allergies
- Piperacillin-tazobactam for grade III open extremity fractures
  - Clindamycin and aztreonam for grade III open extremity fractures with penicillin or cephalosporin allergies

New policy:

- 2g cefazolin for all patients with an open fracture
  - Clindamycin for patients with penicillin or cephalosporin allergies
- Antibiotic type and dosing to be adjusted by orthopedic or trauma surgeons following consultation

After developing this policy, all orthopedic, trauma, and ED physicians, mid-levels, and ED nursing staff were educated on the changes and signs were hung throughout the ED to remind staff of the changes

## MEASURING THE EFFECTS

Initial education was presented to ED and trauma physicians in February 2018.

The open fracture antibiotic policy was changed in April 2018.

Time to IV antibiotic in patients with open long bone fractures was collected from September 2017 – May 2018. Patients arriving prior to the policy change were compared to those arriving after the change.

Patients with isolated fractures of the skull, spine, or face and patients with penetrating injuries were excluded from analysis.

Median times to antibiotics:

- Prior to policy change = 122 minutes [IQR: 54 – 233 minutes]
- Post policy change = 55 minutes [IQR: 35 – 197 minutes]
- P = 0.030

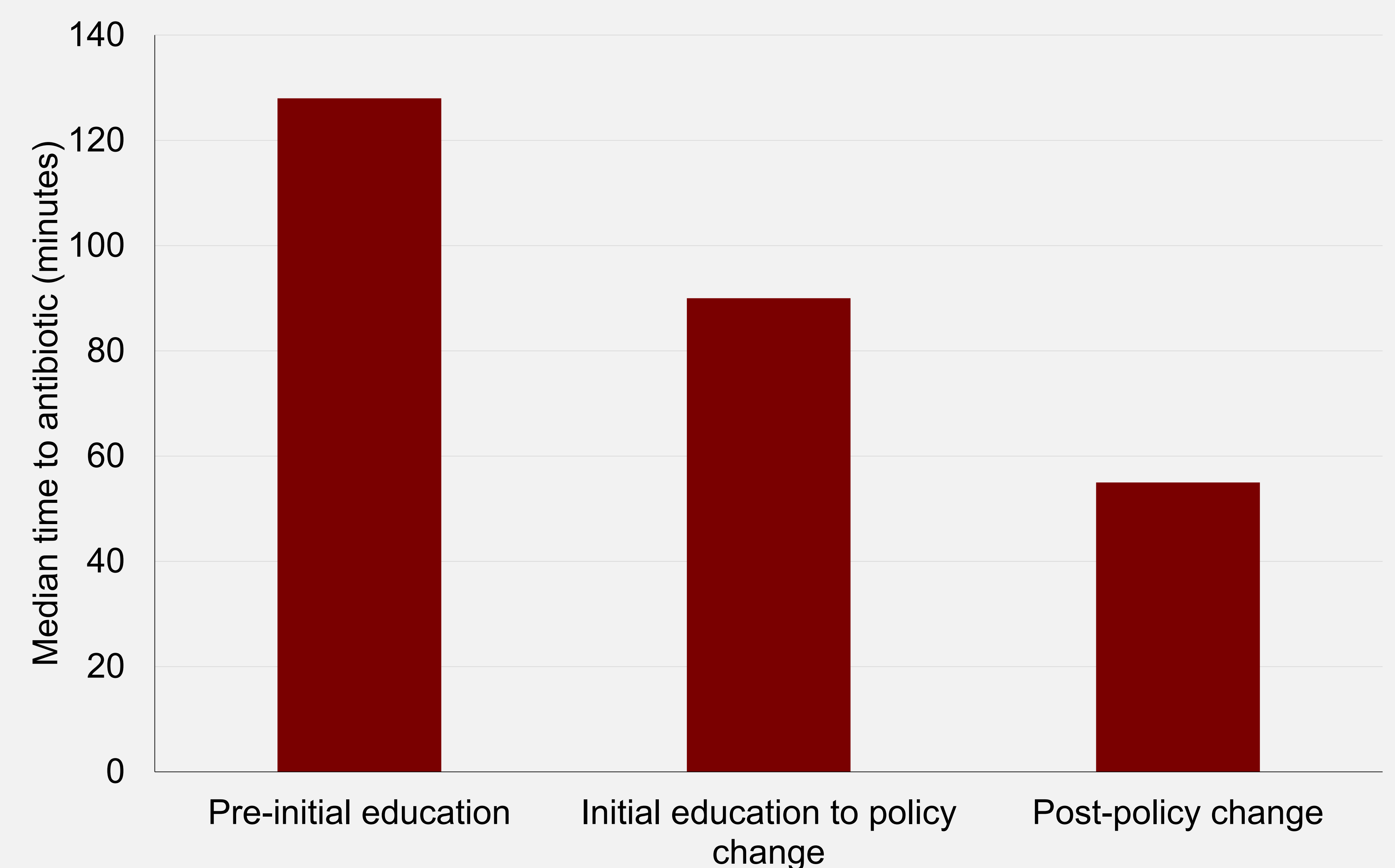


Figure 1. Times to antibiotic during education and implementation periods

## SUSTAINING THE CHANGE

- Orthopedic trauma order sets were changed to reflect the new policy
- Staff continue to be educated on the changes
- A quick-order button for open fracture cefazolin has been added to the Electronic Medical Record
  - Use of this button will be monitored to determine when it is being used and to identify which practitioners may require further education as reminders to utilize the new order
- The open fracture work group will continue to monitor progress and the average time to antibiotics
  - Times will be calculated and presented at the monthly Trauma Audit Committee and the ED trauma resuscitation committee meetings

## REFERENCES

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