Reducing Unnecessary Lab Orders on the Inpatient General Internal Medicine Service
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Introduction & Background
Excessive laboratory testing contributes to the increasing cost of healthcare without enhancing patient care. Studies have demonstrated increased adverse outcomes and decreased patient satisfaction associated with excessive daily blood draws. Furthermore, unnecessary laboratory tests may contribute to errors, lower patient satisfaction, patient debt burden, hospital acquired anemia, physician information overload, ignorance of crucial data, and need for further testing to follow up on anomalous or incidental results.

Our aim was to reduce the number of unnecessary lab orders per patient per day by >15% within 3 months on the inpatient internal medicine service at BMC.

Methods

Measures:
To measure our progress, real time data was recorded of the number of routine labs ordered per patient by 4 inpatient general medicine teams at BMC. This was performed 3 times per week on a random sample of 5 patients per team each day and the averages calculated for each team for the week (a total of 15 patients per team per week). Data was recorded continuously for 23 weeks.

The lab tests we were specifically monitoring were CBC, BMP, CMP, Magnesium and Phosphate. These labs were selected as they are the most frequently ordered labs and are considered routine tests.

Interventions:
In order to accomplish our aim of reducing unnecessary lab orders, surveys were performed to develop root cause analysis driving unnecessary morning orders. Educational interventions targeting residents involving large group and small group interactive teaching and reflection sessions were implemented. This provided education about the futility as well as the patient burden of unnecessary labs. Additionally, residents’ habits of routinely ordering labs without necessarily considering patient impact, treatment strategy, and test cost were addressed.

Our second intervention was geared more towards the attending physicians. Attending physicians were encouraged to conduct rounds dedicated to discussing daily lab orders as well as setting their expectations from the residents.

Our third and final intervention was placing posters in the work rooms on the floors to remind interns and residents to be mindful of their patients’ best interests and think about the benefits and risks before ordering morning labs.

Interventions were spaced about a month apart in order to gauge both the effects of individual interventions, in addition to evaluating the compounded effect.

Results

Before any interventions were undertaken, a baseline was established for the first 5 weeks across the 4 inpatient service teams. Average lab orders was 2.8 labs/patient/day. Following the first intervention on week 6, a non random decrease in lab orders was witnessed as evidenced by a shift of more than 6 data points below the established mean, reaching a new mean of 2.3 labs/patient/day (a decrease of 18%). This decrease was sustained as further interventions were implemented on weeks 12 and 15, although no measureable further decline in lab orders was noted (Fig. 1).

The decline in daily orders was not uniform across all 4 teams, as different teams responded differently to our interventions. Team 2 showed the most substantial decrease in lab orders from 2.6 labs/patient/day to 1.6 labs/patient/day - a 38.5% decrease, well above our anticipated target of 15% (Fig. 2). Similarly Teams 1 & 3 showed significant decreases in lab orders of 30.5% & 19.2% respectively. On the other hand, Team 4 showed no significant improvement maintaining an average lab order of 2.3 labs/patient/day.

More extensive and inclusive data obtained from BMC’s data warehouse of all the labs ordered by all 6 inpatient general medicine teams was analyzed. A baseline was also obtained and a decrease of daily lab orders from 3.5 labs/patient/day pre-intervention to 3.1 labs/patient/day post-intervention was observed. This was a decrease of 11.4%. However, 3 weeks following our last intervention, lab orders started increasing again reaching our original baseline of 3.5 labs/patient/day (Fig. 3).

Conclusion

Daily labs are ordered routinely everyday by residents out of habit. Few wait to think about the benefit of these labs and whether it would have input on the patient’s care. Our simple educational interventions and reminders have had a significant impact on reducing unnecessary lab orders. Our interventions did not seem to have a cumulative effect; rather each subsequent intervention maintained the same effect produced by the first educational initiative. However, this effect was only sustainable for a few weeks following the final intervention, after which daily lab orders returned to our original baseline.

This suggests that subsequent interventions acted as reminders to our initial educational initiative, and once reminder ceased, residents returned back to usual habits.

We conclude that to be able to effectively reduce unnecessary daily lab orders, continuous reminders must be implemented following initial education about the cost and potential harm of unnecessary lab tests.

References