

## SCCM Choosing Wisely KEG meeting October 21, 2020

### **Lab Use and Optimization in a Trauma ICU**

Speaker:

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Slides are available on SCCM Connect - Choosing Wisely KEG website

- Dr Domonoske opened by reviewing the Choosing Wisely initiatives related to ordering diagnostic tests at regular intervals
- Within his organization, recognized a pattern of obtaining ionized calcium daily, regardless of results
- Upon investigation, the most common reasons for this behavior were due to training, a sense of security knowing lab values are within normal range or simply provider preference. These reasons speak to how the provider feels, rather than what the literature tells us is of benefit
- Intervention in shock-trauma ICU – 23 bed unit
  - Ionized calcium - FY 2016:
    - Obtained 4,743 ionized calcium levels:
    - <10% abnormal values
    - Each level is 5 ml blood ~ 79 units blood
    - Cost for levels ~ \$175k
  - Is the normal range the same for critically ill patient as for a normal healthy individual? What does the data tell us re: iCa & mortality?
    - Egi, M. et al. Crit Care Med. 2011;39(2):314-21
    - Multivariate analysis revealed iCa < 0.8 or > 1.44 associated with change in mortality
    - The practice at Dr. Domonoske's organization was to replace calcium if < 0.95 (marked as 'low' in their EMR)
  - Phosphorous - FY 2016
    - Obtained 8,875 phosphorous levels
    - 22% at low end of normal, percent incidence decreases as you move toward more severe hypophosphatemia
    - Cost for levels ~ \$200k
  - Magnesium - FY 2016
    - Obtained 4,153 phosphorous levels
    - ~6% abnormal (low) values
    - Cost for levels ~ \$300k
  - FY 2016 – for iCa, phos, mag
    - Obtained 17,771 levels
    - Withdrew approximately 79 units of blood
    - Spent ~ \$675,000
    - To find 1,084 labs to be treated (6.1%)
- Process of change:
  - Address 'addiction' – recognize there is a problem
  - 'Wean' from daily labs (even/odd approach, no orders for daily labs)
  - Educate on performance (% of hi/low/normal values)

- Daily discussion on rounds
- Communicate 'lab holiday' with night shift
- Address WHO manages electrolyte replacement
- Address WHEN to replace (not all labs marked 'low' need to be replaced)
  - Ex: indications to check iCa in STICU = massive blood transfusion, CRRT, new onset dysrhythmias, new onset cardiovascular instability
  - Replace for iCa < 0.8 mmol/dL
- Developed proactive approach to phosphate replacement (treat like hypophosphatemia prophylaxis)
  - Hypophosphatemia: ~ 75% of patients at shock trauma will become hypophosphatemia within the first 3-4 days
  - When starting enteral nutrition, start oral phosphate supplementation
- Results:
  - Cut iCa in half
  - Also reduced number of lab levels for mag and phos per patient days.
  - Not much change for BMP or CBC per patient day
  - Did see reduction in CXR per patient day – physicians took what they learned and applied to CXR
- Future focus areas:
  - Would be good to have other organizations to benchmark against
  - Need to discuss data outside the ICU
  - Measure clinical impact
- Questions/comments:
  - When fellows were presented with data re: discretionary spending, did that change practice? Yes and no – those performing similar to ICU baseline had no change. Some fellows were presented with their performance compared to the ICU and their colleagues – that helped change practice with those individuals.
  - Were there any questions or pushback re: time to replacement (electrolyte replacement protocol was removed)? No. Nurses were happy to hand off to resident. These can be addressed in a timely fashion at the morning huddle.
  - Was guidance/education provided on how to replace electrolytes? Yes
  - Each patient population is unique and has its own challenges but there is probably a fair number of patients in every ICU that are stable. It's the stable patients that most of this presentation applies to.