Reduction of unnecessary post-operative CBC after Cesarean delivery: quality improvement project

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Presenter disclosures

None

Should we measure post-op hemoglobin?

VS.

MEASURE

- ❑ Detect treatable anemia
- ❑ Affirm clinical stability*
- ❑ MD reassurance

DON'T MEASURE

- ❑ Testing cost (4$/CBC)
- ❑ Nursing/phlebotomist time
- ❑ Patient discomfort
- ❑ Increase rate of intervention

What do we know about post-op Hgb?

- Routine ordering varies by institution
- Six retrospective studies of CD (n = 3519) all recommend against *routine* Hgb ordering [1-6]

AVERAGE Hgb ↓
Elective: 9-14 g/L [1,6]
Non-elective: 5-15 g/L [2,7]

RATE OF TRANSFUSION
Elective: 1% [4,5,8]
Non-elective: 2-3% [4,9]

Risk factors for severe post-op anemia

- ❑ Pre-op anemia
- ❑ Higher blood loss
- ❑ Longer operating time
- ❑ Non-elective surgery

Post-op CBC ordering at MSH is *routine*

- Dataset from an *ERAS** database at MSH (May ‘22 – Jan ‘23)
- Randomly selected singleton CD
- Post-operating order rate was 98%

Hemoglobin (g/L) patterns after Cesarean delivery (CD)

CD type	n	Mean pre-op	Mean post-op	Mean change (SD)	90%ile change
All	214	121.8	103.4	-18.4 (12.0)	-31
Planned	123	120.5	104.9	-15.6 (19.2)	-26
Unplanned	91	123.6	101.5	-22.2 (14.2)	-36

**Enhanced recovery after surgery*

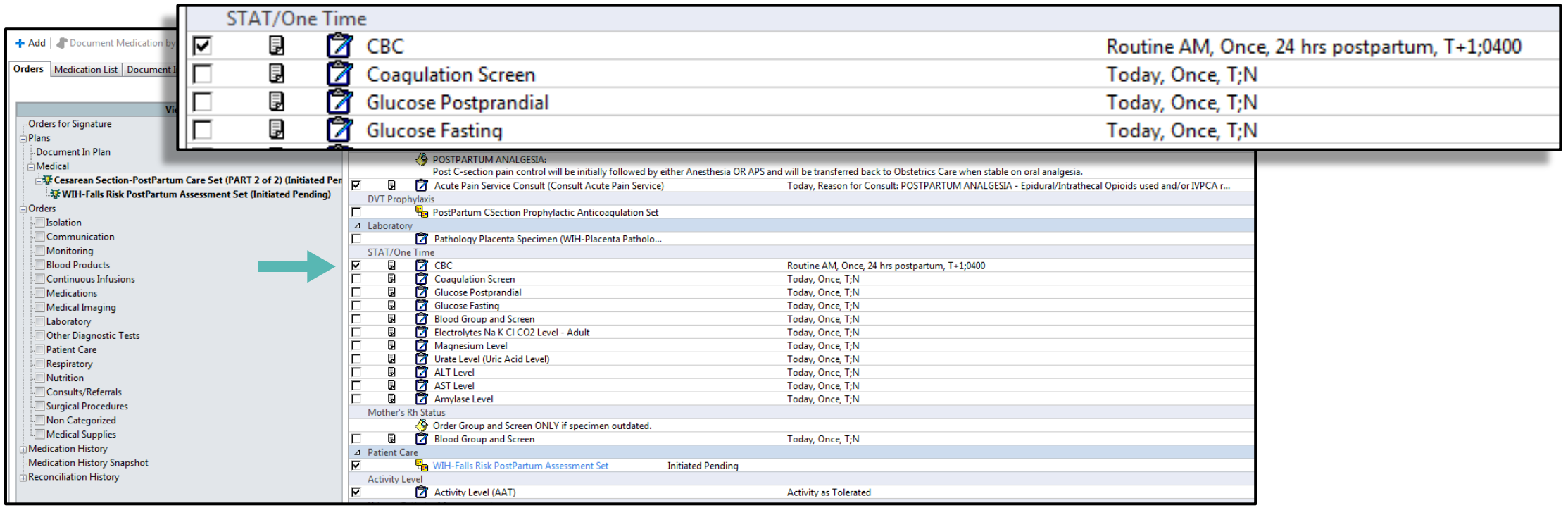
Aim statement

"We aimed to reduce the rate of post-op CBC draws for *all* patients having CD at MSH from **98%** to **50%** during April 2023."

Intervention

**discussion during OR debrief*

1. Communication to all relevant staff (RN, MD)
2. Remove CBC from the order set



DOES YOUR OPERATIVE PATIENT NEED A POD#1 CBC?

CONSIDER A POD#1 CBC WHEN:

1. Pre-op Hgb < 110 g/L
2. Above average blood loss
3. Above average operating time

REDUCING ROUTINE CBC PROJECT v2 2023 (PI: DR. C. JONES)

**at the discretion of the ordering team*

Study timeline

Ordering options:

- ❑ Significant pre-op anemia ≤ 110 g/L
- ❑ Above average blood loss
- ❑ Above average operating time
- ❑ Other (please specify)

Data collection

- Patient & delivery characteristics
- **Process measures**
  - Hgb ordering
  - Order indication
- **Outcome measures**
  - Post-op Hgb draws
  - Draws with *indication*

- **Balancing measures**
  - Missed draws
  - Signs & symptoms of anemia
  - Intervention rates (PO/IV iron, pRBC)
  - ER visits (≤ 2 wks)

Study population

Parameter	Total (n = 202)	Unplanned (n = 114)	Planned (n = 88)
Gestational age (wks), mean (SD)	38.1 (2.6)	37.9 (3.2)	38.3 (1.4)
Repeat CD, n (%)	67 (33.2)	19 (16.7)	48 (54.5)
Hemoglobin (g/L), mean (SD)			
Pre-operative[a]	122.1 (10.6)	121.6 (12)	122.8 (8.5)
Post-operative[b]	94.7 (16.3)	94.8 (16.4)	94.6 (16.3)
Change[c]	-23.4 (14.1)	-23.1 (14.4)	-24.2 (13.5)
Operative parameters, mean (SD)			
IV fluids (mL)	1508 (538)	1556 (638)	1446 (365)
Estimated blood loss (mL)	730 (313)	793 (382)	649 (161)
OR duration (min)	54 (18)	54 (18)	54 (18)

[a] missing data 1 (unplanned)
[b] missing data 63 (unplanned); 70 (planned)
[c] missing data 64 (unplanned); 70 (planned)

Results

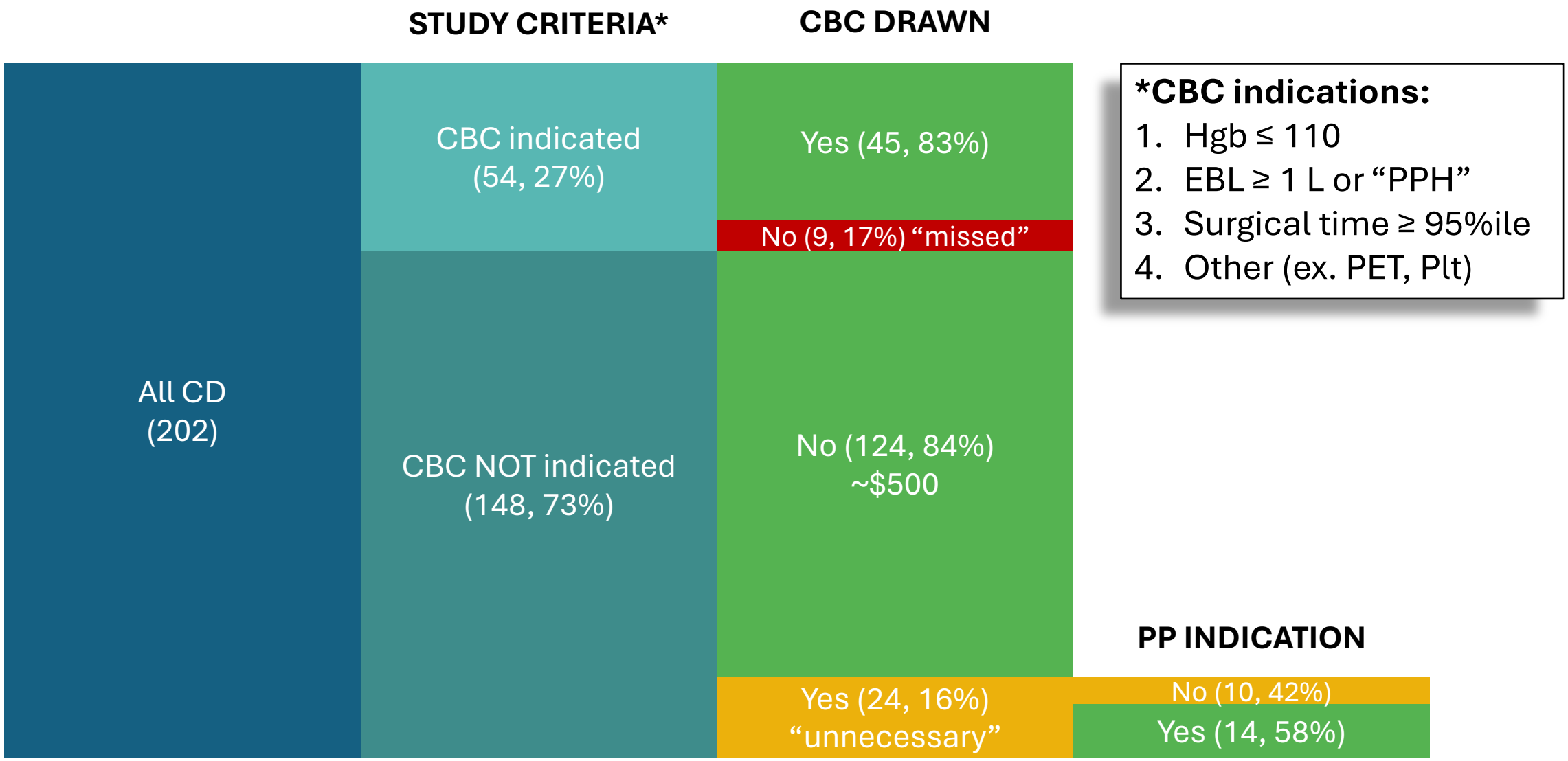
Process measures

- Hgb ordering → messy…
- Order indication → Often absent

Outcome measures

- Post-op Hgb draws → 34% (69/202)
- Draws with *indication* →

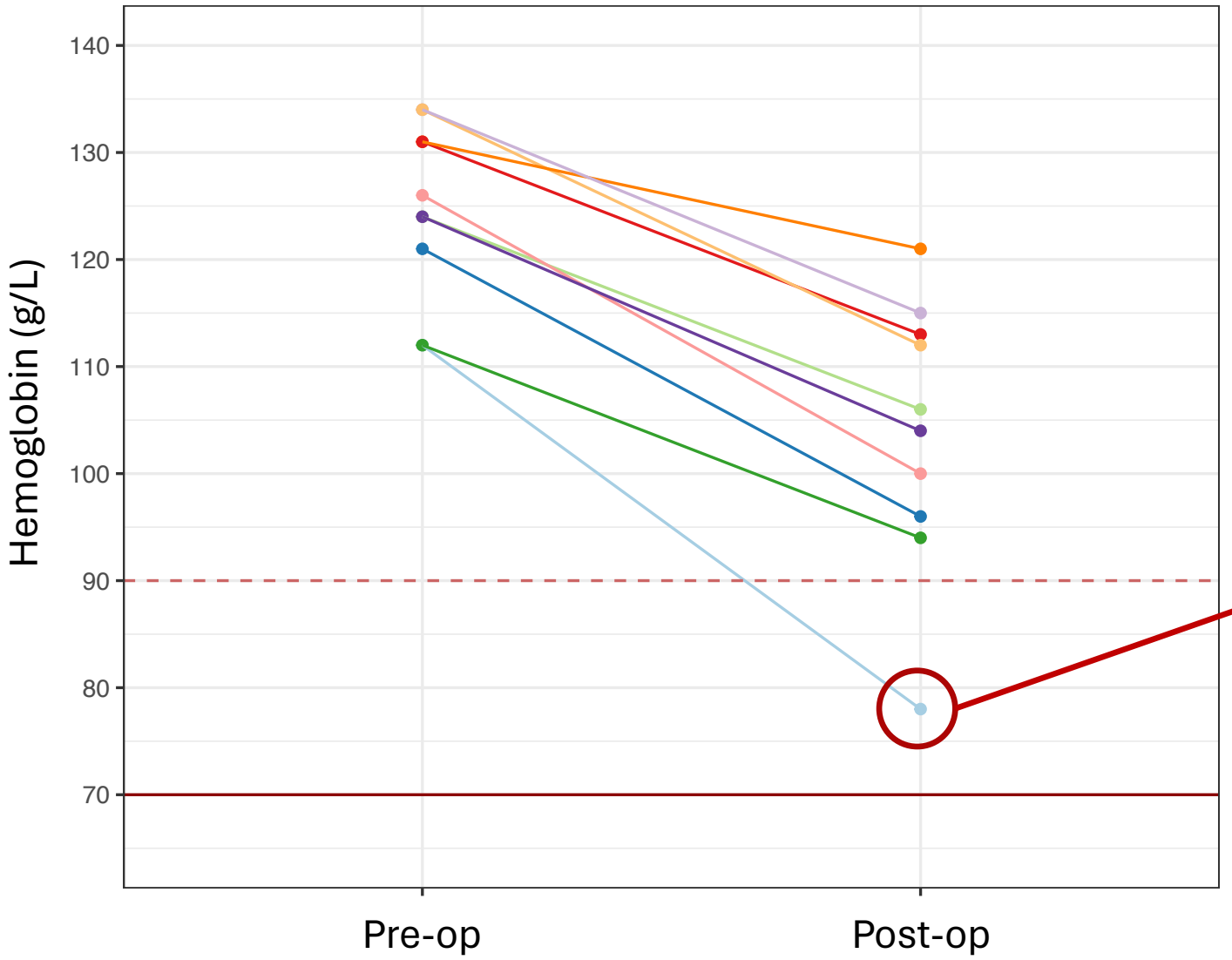
CBC draws by *indication*



***CBC indications:**

1. Hgb ≤ 110
2. EBL ≥ 1 L or "PPH"
3. Surgical time ≥ 95%ile
4. Other (ex. PET, Plt)

What about the 10 patients that had a *routine** CBC?



Patient #103
Rx: PO & IV iron prior discharge

Balancing measures

Unintended consequences of not measuring Hgb

1. Post-partum S&S of anemia (n = 17)
    - All had CBC drawn before discharge
2. ER visits
    - Patients without a post-partum Hgb (n = 133)
        - 6 visits to the ER
            - 2 with anemia-related symptoms (SOB, CP)
                - Hgb 101 and 114 g/L

Anemia-related interventions

Parameter	Total (n = 202), n (%)	Hgb range[a] (g/L)	Missing Hgb, n (%)
Oral iron script	24 (11.9)	67[b] – 98	8 (33)
IV iron	22 (10.9)	69[b] – 99	1 (5)

[a] Range reported when either oral or IV iron alone was prescribed
[b] Patient with minimum Hgb value was transfused

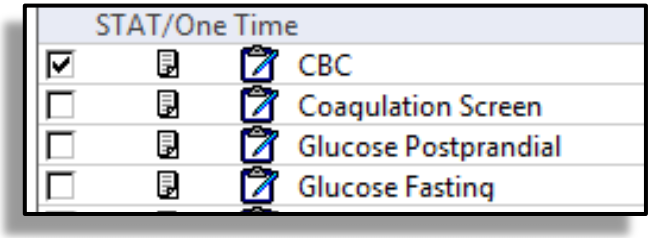
Parameter	Total (n = 202)	Unplanned (n = 114)	Planned (n = 88)
Transfusion	5 (2.5)	4 (3.5)	1 (1.1)

Conclusion & limitation

- **Conclusion**
  - Successful reduction CBC draws (98% → 34%)
  - Nine "missed" cases (4.5%)
- **Limitations**
  - Estimates of blood loss are inaccurate*
  - Orders vs. draws
  - Unmeasured anemia-related symptoms at home
    - ***BUT*** routine Hgb measure ≠ treatment

Lessons

- Electronic ordering gets messy
  - Order set change isn't enough
  - Target institutional "culture"



- *Removing* orders leads to "missed" draws ***BUT***
- *Unchecking* a routine order works well
- Goal ≠ eliminate CBC ordering, but to promote ordering for a *clinical indication*

Thank you!

Research team:

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