

Wellness Bias, Maternal Physiology, and the Hidden Drivers of Maternal Mortality:

An Obstetric Perspective for Anesthesia Professionals

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SUMMARY

To address rising maternal mortality, Anesthesia professionals must recognize and overcome "wellness bias"—the dangerous assumption that OB pts are inherently healthy and resilient.

Shifting maternal demographics & underlying chronic conditions necessitate proactive, vigilant clinical monitoring to detect and prevent ***rapid decompensation often masked by normal physiological changes of pregnancy.***

INTRODUCTION

- US continues to face rising maternal mortality and severe maternal morbidity (SMM).
- Sepsis accounts for 13% of maternal deaths, on par with hemorrhage & HTN d/o¹
- **Astonishing how often these cases are deemed preventable** (94% per CDC 2022 data)
 - ✓ **delayed recognition**
 - ✓ **delayed escalation**
 - ✓ **interventions initiated only after a pt is critically ill**
- Improving forecasting decompensation and earlier intervention requires acknowledgement of two hidden contributors to maternal morbidity and mortality:
 - **Wellness Bias** and **Physiologic Masking in Pregnancy**
 - These cognitive traps are particularly relevant to Anesthesia, as we are often involved in pt care ***only once decompensation has already occurred***, and face the daunting task of resuscitating pts who have *already lost the reserve* that pregnancy physiology once provided.

A close-up photograph of a pregnant woman's arm. An IV drip is attached to her forearm, and a fetal monitor strap is visible. The background is blurred, showing a hospital setting.

“WELLNESS BIAS” AND THE “NORMALIZATION OF DEVIANCE” IN PREGNANCY CARE

WELLNESS BIAS



The subconscious tendency among clinicians to assume that young, healthy-appearing pregnant pts are well, even when symptoms suggest otherwise.²

- Can extend to medically complex pregnant pts with pre-existing conditions
 - Can minimize real medical conditions that actually make the pregnancy extremely high risk.
 - Especially in a progressively older and obese OB population with higher risks of Severe Maternal Morbidity (SMM) and Mortality.
- Wellness bias inherently lowers clinical suspicion for serious conditions.
 - Eg: OB pts with infection or sepsis, wellness bias can lead to **minimization of concerns voiced by the pts**, or dismissal of abnormal VS and labs.
 - This pregnancy-related optimism:
 - Dismisses tachycardia as “normal in pregnancy”
 - Dismisses SOB as a “gravid uterus”
 - Accepts postpartum fatigue as normal instead of evaluating for possible sepsis or cardiomyopathy.



Normalization of Deviance

Related phenomenon through which safety standards gradually erode over time after repeated encounters without negative outcomes.³

- Both **Wellness Bias & Normalization of Deviance** common in OB & Pedi, where abnormal outcomes are relatively infrequent and *most* pts *appear* healthy.
 - Eg: disregarding alarms, bypassing protocols, skipping checklists
 - Unintentional denial, dismissal, & ultimately delays → morbidity & mortality.
 - Compounded by unconscious biases toward marginalized populations, further widening disparities in diagnosis & treatment.
- **These cognitive traps delay recognition and escalation of care, placing both maternal & fetal outcomes at risk.**
 - Delayed recognition of serious medical conditions may mean Anesthesia involvement only occurs once the pt is *in extremis* - when intubation, hemodynamic support, or transfusion carry higher risks and lower margins for safety.

MATERNAL PHYSIOLOGY THAT MASKS DETERIORATION

The physiology of pregnancy can create dangerous situations where pts appear stable until they suddenly are not,

particularly when systems rely on nonpregnant thresholds for alerts.

- Health care team may not be trained and actively aware of early signs of decompensation in a pregnant pt.
- Clinical understanding of maternal vitals and physiology is critical to early recognition.
 - Eg: while expanded plasma volume and reduced SVR in pregnancy may result in a mildly increased maternal HR and lower BP, **frank tachycardia and hypotension** may be erroneously interpreted as “normal” [without working up infection, hemorrhage, etc]
 - Similarly, a blunted febrile response in pregnancy means infection may present without fever
 - 20% of maternal sepsis cases present without a fever.²



<https://soulafawomandotblog.wordpress.com/2018/09/18/take-off-the-mask/>

Maternal Differences in Lab Values

Most system lab values are not adjusted for pregnancy, nor are critical alerts built into Health Care systems (HCS) for pregnancy-specific abnormalities.

- This forces OB care teams to rely on individuals to remember these differences.
- EHR/EMR systems with maternal-specific alerts for both VS and labs are essential for any HCS providing OB care, and should be extended to ED, OR, and ICU, where OB pts may be.¹⁰
- Misinterpretations of maternal physiology can also lead to delays:
 - Eg: “tachypnea is physiologic to pregnancy.”
 - **Incorrect, the compensatory rise in RR should not be > 24**
 - Baseline Cr in pregnancy of 0.4–0.8 mg/dL
 - **“Normal” Cr of 1.0 mg/dL reflects developing AKI**
 - Normal pregnant PaCO₂ is ~32–35 mmHg
 - **“Normal” PaCO₂ of 40 mmHg is abnormal signaling hypoventilation, CO₂ retention, & possible impending respiratory collapse.**
 - Expanded IV volume and the resultant dilutional anemia of pregnancy can obscure bleeding.
 - 3rd TM, normal fibrinogen > 400 mg/dl
 - **“Normal” value of 200 mg/dL is critically low in pregnancy and suggests coagulopathy**⁶⁻⁹

National Partnership for Maternal Safety

Maternal Early Warning Criteria (MEWC)

- To aid in faster recognition, evaluation, diagnosis, & treatment of signs of developing critical illness, to reduce preventable maternal death.
- Predicts deterioration & alerts abnormal VS.⁴⁻⁵

If (+): Low threshold
to obtain further
imaging: TTE, CXR,
LUS, ECG, & LABS

Systolic BP (mm Hg)	<90 or >160
Diastolic BP (mm Hg)	>100
Heart rate (beats per min)	<50 or >120
Respiratory rate (breaths per min)	<10 or >30
Oxygen saturation on room air, at sea level, %	<95
Oliguria, mL/hr for ≥ 2 hours	<35
Maternal agitation, confusion, or unresponsiveness; Patient with preeclampsia reporting a non-remitting headache or shortness of breath	

RED FLAGS in PREGNANCY

NORMAL PREGNANCY ADJUSTMENTS

RED FLAGS THAT MAY BE MISSED

HR up to 100–105 bpm

HR > 110 bpm = possible early shock

BP may trend slightly lower

SBP < 105 mmHg = not benign

PaCO₂ 28–32 mmHg

PaCO₂ ≥40 mmHg = hypoventilation, CO₂ retention

Creatinine 0.4–0.6 mg/dL

Creatinine ≥ 1.0 mg/dL = abnormal

RR elevated slightly, but not above 24

Low-grade fever (≥100.4°F) = possible sepsis

New O2 requirement or unexplained dyspnea = possible PE, pneumonia, or sepsis

- R/o hemorrhage, sepsis, CV dysfunction/HF, ECG
- R/o hemorrhage, anesthetics, sepsis, CV dysfunction/HF
- BiPAP, CXR, Toxicology, labs, etc
- NO NSAIDs/toradol (eg: PreE c/s), r/o PreE, HELLP, hemorrhage, AFLP etc
- Labs, sepsis, PNA? meningitis? pyelo/urosepsis?
- BNP*, CXR, Lung US, Labs, etc
- Any positioning change/tripod to “breath better” → immediate workup

- ✓ Serum Na⁺ 130—140 mmol/L is **NORMAL**
- ✓ Elevated Alk Phos 2-3x above nonpregnant values is **NORMAL**
- ✓ Lactate 2-4 mmol/L during **active labor** can be **NORMAL** and does not alone indicate sepsis.
 - Rarely > 4 mmol/L
- ✓ Elevated WBC up to ~16/17k is **NORMAL** in 3rd TM and can rise to ~20k during labor

BIAS IN WITHHOLDING MATERNAL DIAGNOSTICS & THERAPY

Wellness bias can overemphasize *theoretical* fetal risk at the expense of *maternal safety*

- Too often, diagnostic tools and therapeutic interventions are delayed or withheld in pregnancy because of perceived teratogenicity, radiation risk, or concerns regarding drug transfer to breastmilk
 - **DESPITE evidence that timely maternal intervention is the best protection for both mom and baby**
 - Eg: not obtaining a CXR, pulmonary CTA, or other indicated imaging
 - Delaying indicated surgery or cardiovascular tx, or hesitating to give ABT, vasopressors, or other indicated meds.
 - Treatment delays compound delays in recognition of serious conditions, and ↑ M&M

The failure to treat maternal disease aggressively is arguably itself a form of bias

- **In every major mortality review, maternal stabilization is cited as the most important determinant of fetal survival.**
- **Pregnant women should receive the standard-of-care evaluation and treatment.**¹¹⁻¹⁵
 - barring VERY FEW exceptions to known fetal risk (eg: meds known to be teratogenic, when suitable alternatives exist)

SYSTEM-LEVEL CONTRIBUTORS AND EQUITY CONSIDERATIONS

Demographic and social determinants compound risk as maternal mortality is not distributed evenly throughout the population

Pregnancy-Related Mortality (PRM):

- **AGE:** > 40 y/o has **7x increase** vs < 25 y/o, as age-related comorbidities and reduced physiologic reserve amplify risk during pregnancy.¹⁶⁻¹⁸
- **BMI** ≥ 40 kg/m² has **5–6x increase** vs lower BMI.
 - For Anesthesia, → higher risk difficult/failed airway, altered pharmacokinetics, and ↑ hemodynamic instability under stress

Race and ethnicity influence maternal mortality risk:

- Black women have **3-4x higher mortality rate than White women**, with the **highest observed in Black women > 40 y/o**.¹⁶⁻¹⁸
- American Indian and Alaska Native women face over 2x risk than White women.
 - **These inequities persist even when controlling for socioeconomic status and comorbidities, reflecting systemic bias and barriers to care**
 - Women who are uninsured, underinsured, or rely on state-funded health programs face 2-4x higher mortality risk than those w/ private insurance.
 - **Limited access to preventive care, delayed escalation of care, and systemic barriers compound the danger.**¹⁶⁻¹⁸

ANESTHESIA INVOLVEMENT

For **anesthesia teams**, these biases & physiologic challenges converge at the worst possible moment:

the crashing patient with minimal reserve.

Intubation is more dangerous, resuscitation more difficult, & transfusion more urgent when recognition is delayed.

ANESTHESIA RECOMMENDATIONS:

- **Do not accept “normal” at face value.**
 - Remember maternal-adjusted vitals and lab values.
- **Advocate for early escalation.**
 - Push for sepsis bundle activation, massive transfusion protocol initiation, and/or timely ICU transfer as appropriate.
- **Encourage early neuraxial anesthesia when appropriate.**
 - Timely epidural placement may be preferable to automatically waiting until active labor, when worsening pt status (e.g., HELLP syndrome or sepsis) may increase risk of neuraxial anesthesia or even preclude its placement.
- **Support postpartum vigilance.**
 - The postpartum period is where women can decompensate under decreased monitoring and higher nurse staffing ratios. Discharge education regarding warning signs of serious postpartum complications is essential.
- **Promote timely diagnostics and interventions.**
 - Speak up if maternal diagnostics or therapies are being deferred inappropriately out of fetal concern—the **safest fetus is one with a stable mother.**

SYSTEM-LEVEL SOLUTIONS

System-level changes required to fully counteract bias & physiologic masking:

- **Embed pregnancy-adjusted thresholds into EHR early warning systems.**
 - Reliance on nonpregnant normal lab value and vital sign cutoffs is unsafe in obstetrics.
- **Use simulation to expose wellness bias.**
 - Train teams with scenarios where a “well-appearing” patient deteriorates rapidly.
- **Normalize anesthesia involvement in early huddles.**
 - Bring anesthesia in early, not just when the patient is coding.
- **Adopt bundles with explicit anesthesia triggers.**
 - Hemorrhage, HTN, and sepsis pathways should have delineated roles for anesthesia professionals from the start.
- **Institutionalize maternal-first counseling.**
 - Establish standards that reinforce maternal stabilization as the priority in decision-making regarding diagnostics and treatment.

CONCLUSION

- Maternal mortality and SMM will not be reduced without addressing embedded wellness bias and the unique physiology of pregnancy.
- These silent drivers of delay are within our power to fix—by recalibrating our thresholds, building better systems, and challenging our assumptions.
- *For anesthesia professionals, the message is urgent:*
 - *Your vigilance, your voice, and your leadership in early recognition can change the trajectory of care. By speaking up when “normal” isn’t normal, by advocating for appropriate diagnostics and therapies, and by partnering with OBs to counteract bias, we can better forecast and prevent decompensation, prioritize early intervention, preserve maternal safety, and close the gap on preventable harm.*

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