Mass General Brigham

Obstetric Critical Care

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Objectives

- Describe the hallmark physiologic changes of pregnancy relevant to the intensivist.
- Review disease processes unique to obstetrics and associated management pearls.
- Outline an approach to the clinical management of the critically-ill obstetric patient.

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Contemporary Obstetrics

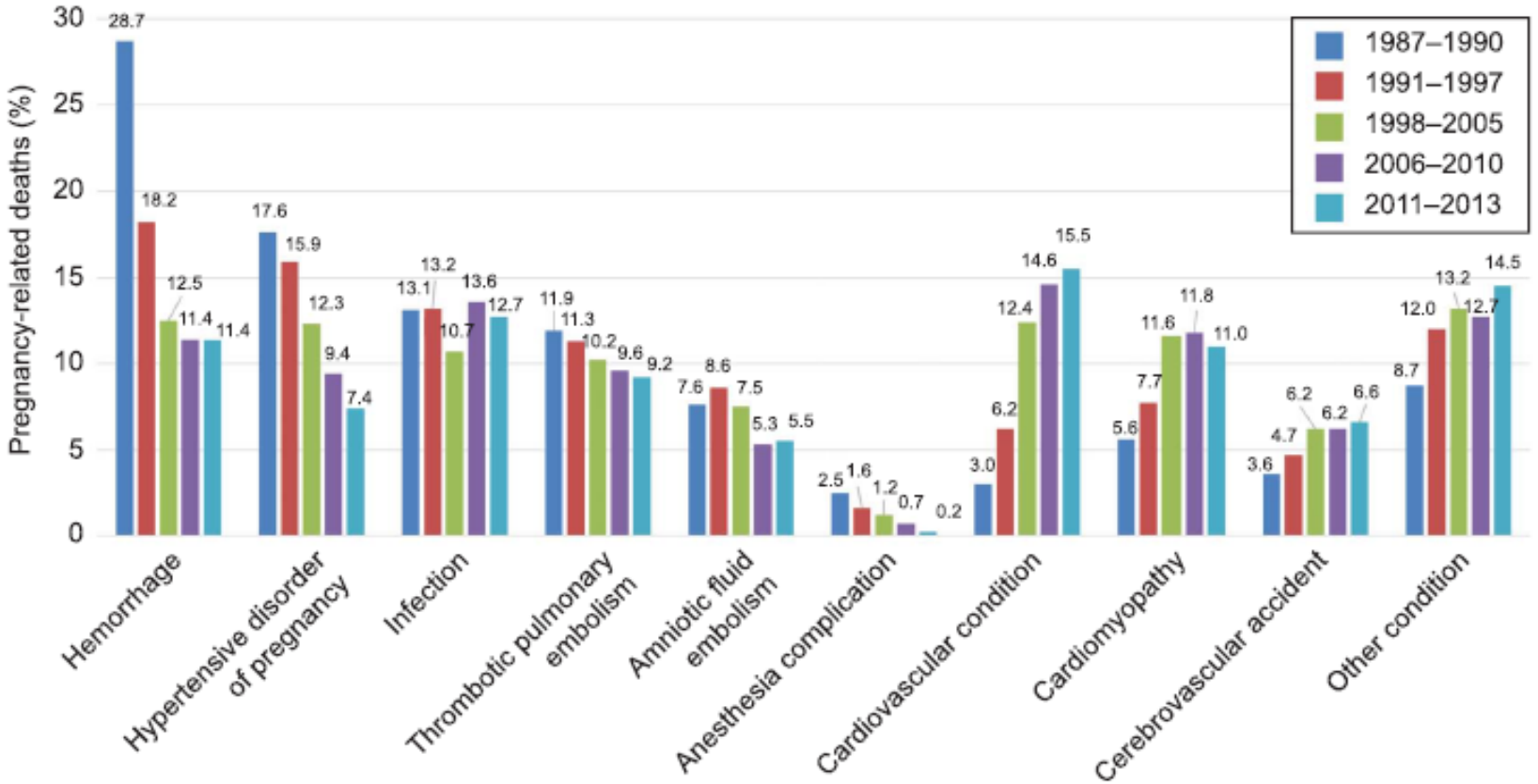
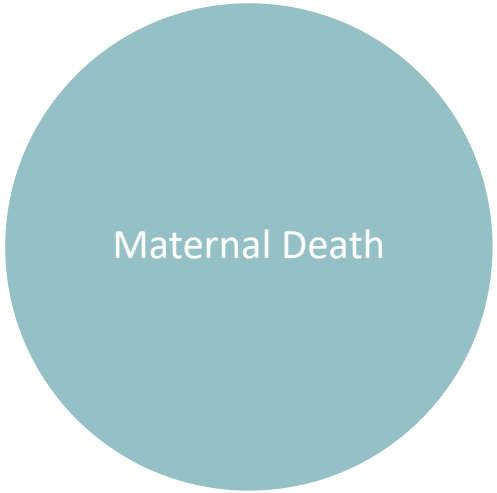


Figure 2. Population-level, cause-specific proportionate pregnancy-related mortality for 1987–1990, 1991–1997, 1998–2005, 2006–2010, and 2011–2013. Results are population-level and can be compared as absolute values.

Creanga. Pregnancy-Related Mortality in the United States. Obstet Gynecol 2017.

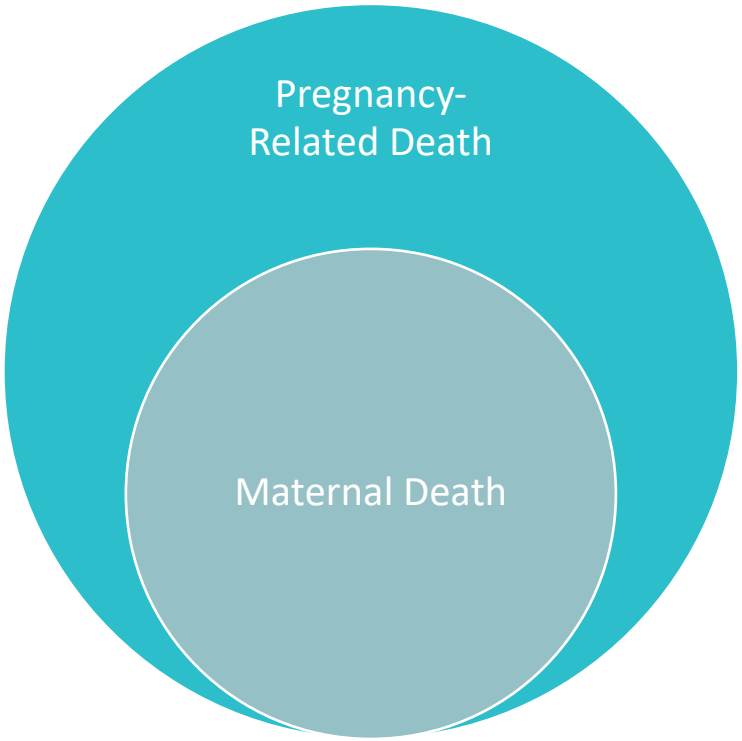
Definitions of Maternal Mortality

Maternal Death: The death of a woman while pregnant or within 42 days of termination of pregnancy, regardless of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental causes.



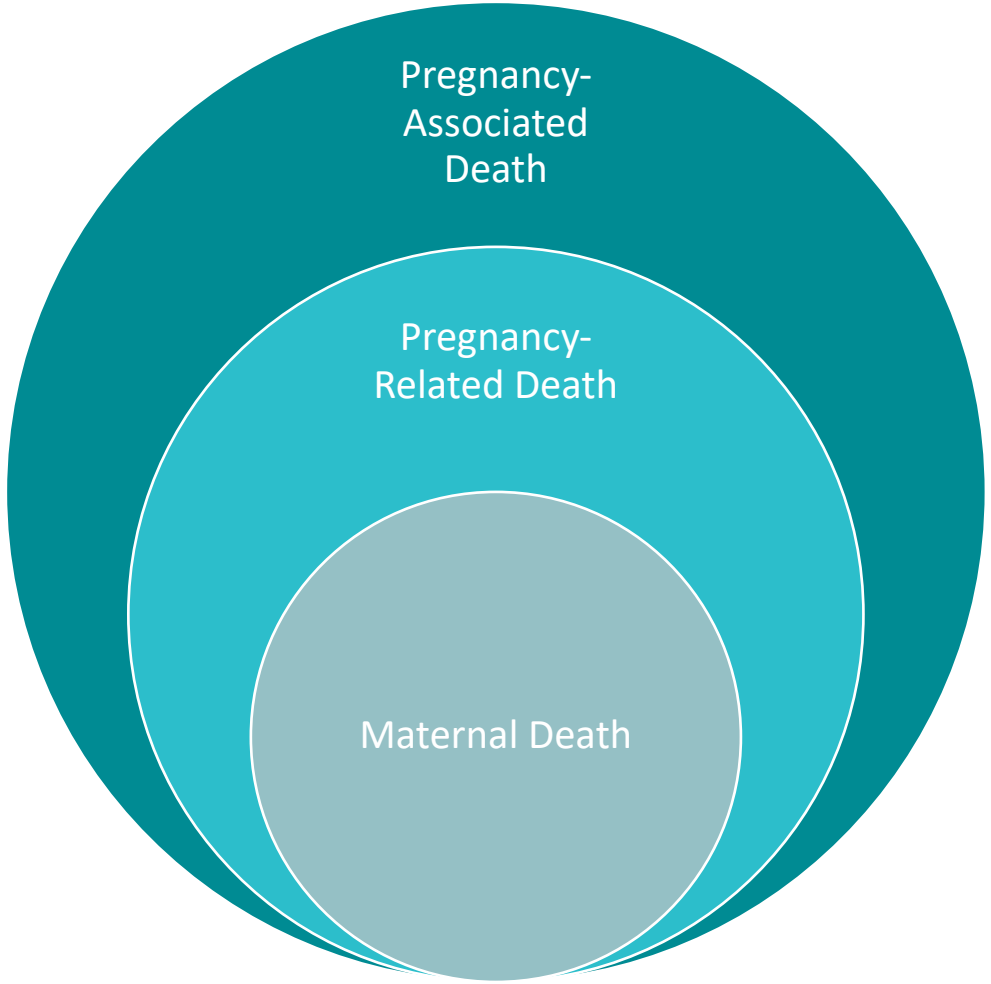
Definitions of Maternal Mortality

Pregnancy-Related Death: A death during or within one year of pregnancy, from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.



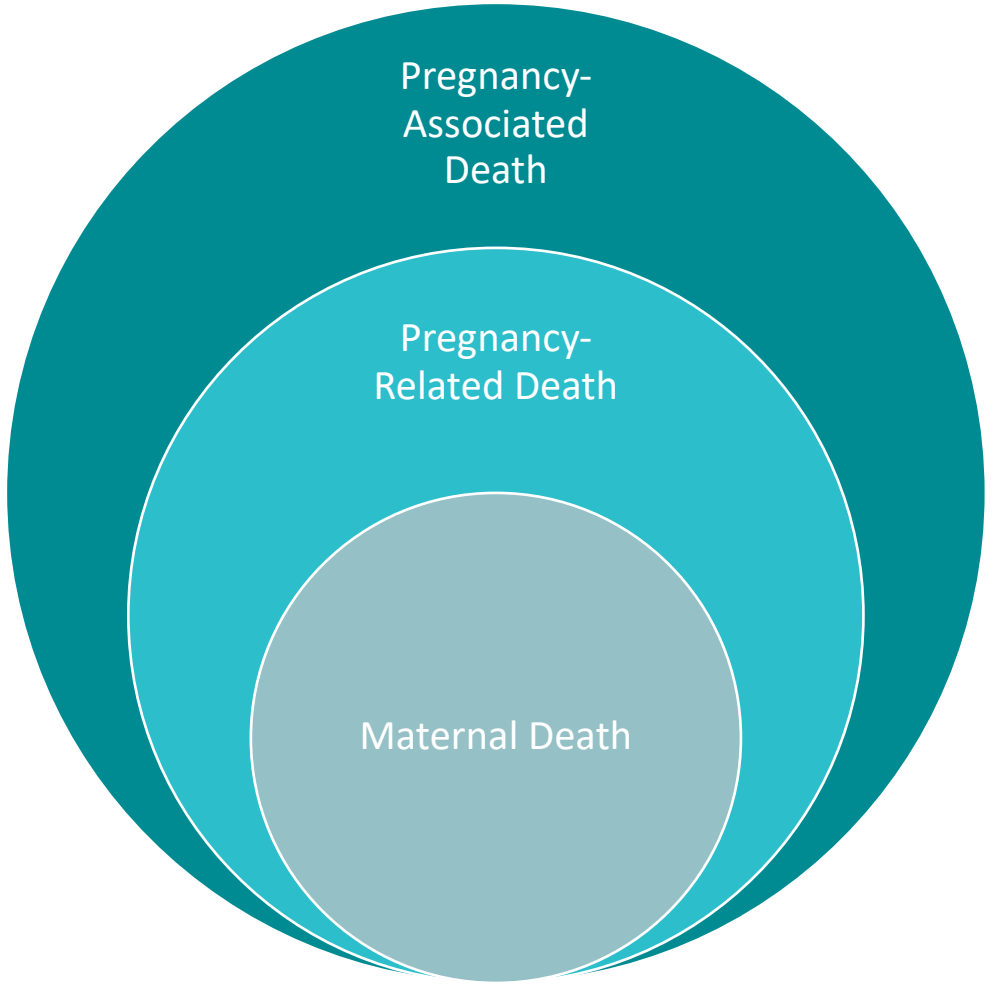
Definitions of Maternal Mortality

Pregnancy-Associated Death: A death during or within one year of pregnancy, regardless of the cause. These deaths make up the universe of maternal mortality; within that universe are pregnancy-related deaths and pregnancy-associated, but not related deaths.

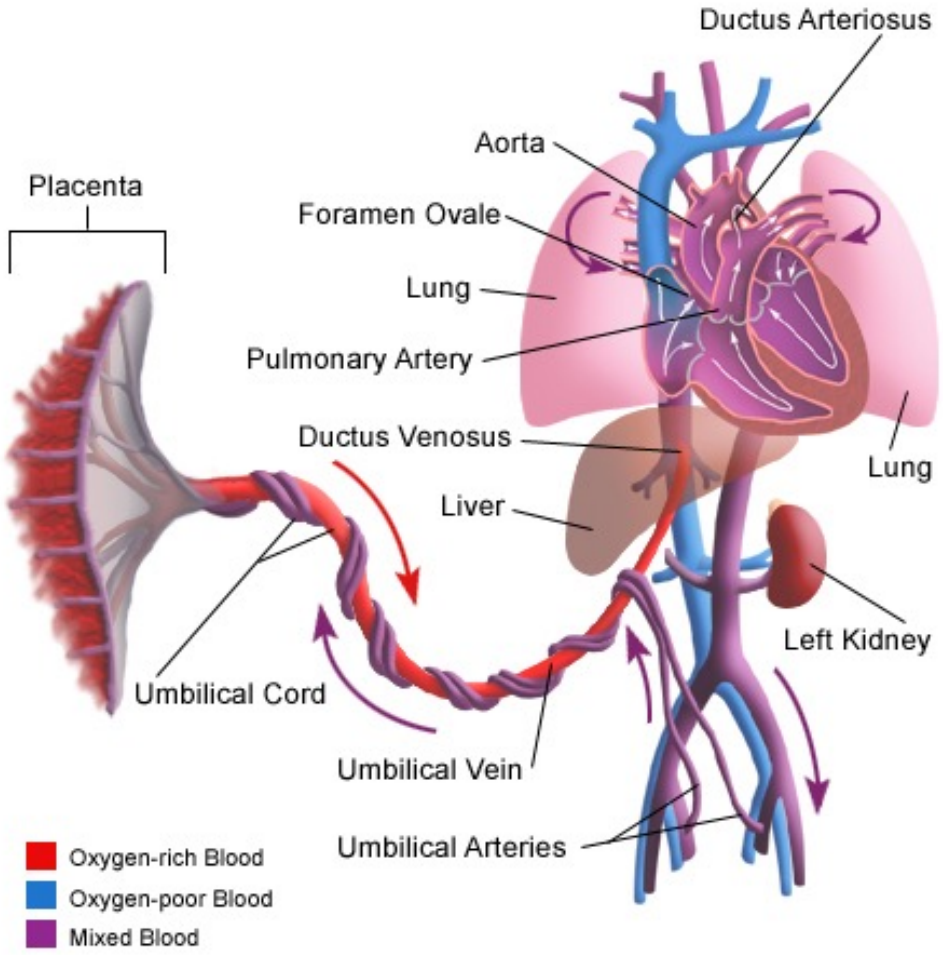


The Controversial Outcome of Death

- **Pregnancy-Associated Death:**
  - Person dies in an earthquake the day before the baby's first birthday.
- **Pregnancy-Related Death:**
  - Death due to peripartum cardiomyopathy 12 weeks after delivery.
- **Maternal Death:**
  - Death in the setting of hemorrhage after delivery for chorioamnionitis.

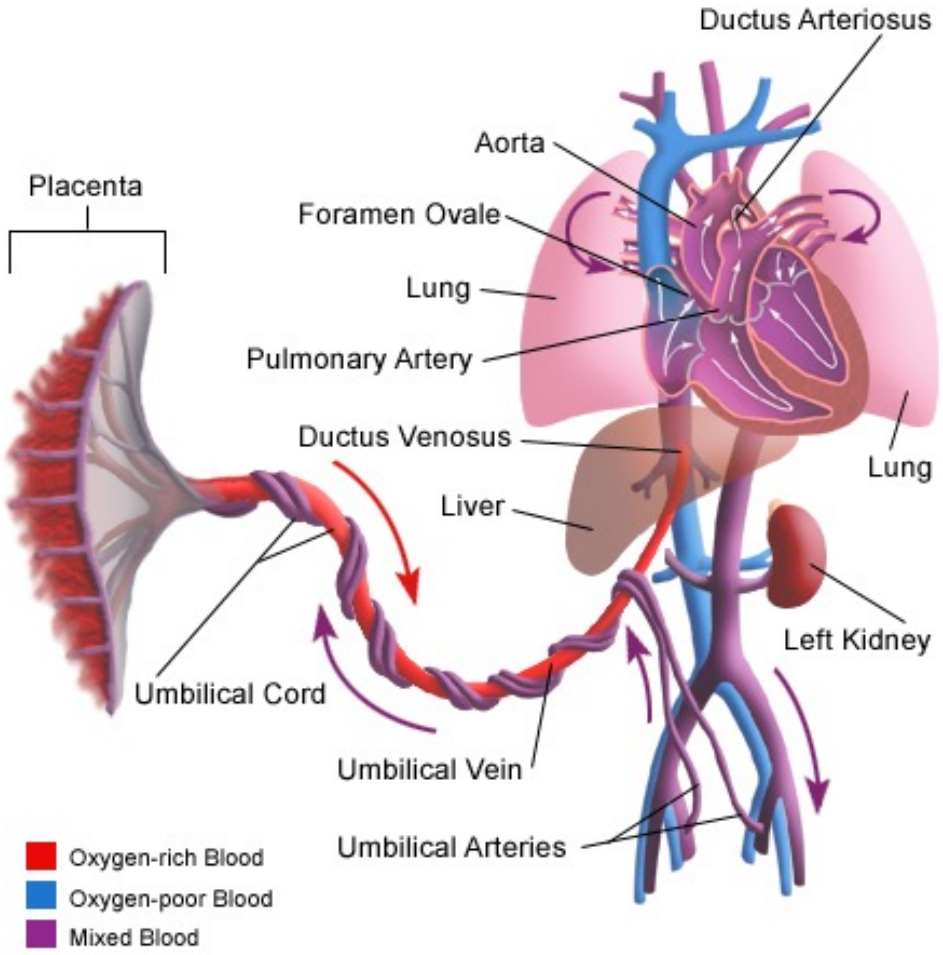


A New End Organ



- Gas Exchange
- Nutrition
- Thermoregulation
- Waste Elimination
- Immunity

Nature's VV ECMO



Increased Cardiac Output

Blood flow to placenta

Oxygen carrying capacity

Respiratory Alkalosis

Oxygen delivery

CO_2 removal

The Original Stress Test

Decreased

Systemic Vascular Resistance

Blood Pressure

Increased

Cardiac Output

Heart Rate

Stroke Volume

Red Blood Cell Mass

Compensated Respiratory Alkalosis

1) More favorable CO_2 gradient at maternal-fetal interface
2) Prioritize oxygen delivery to the fetus (left shift in Bohr curve)

Modified but Reliable Physiology

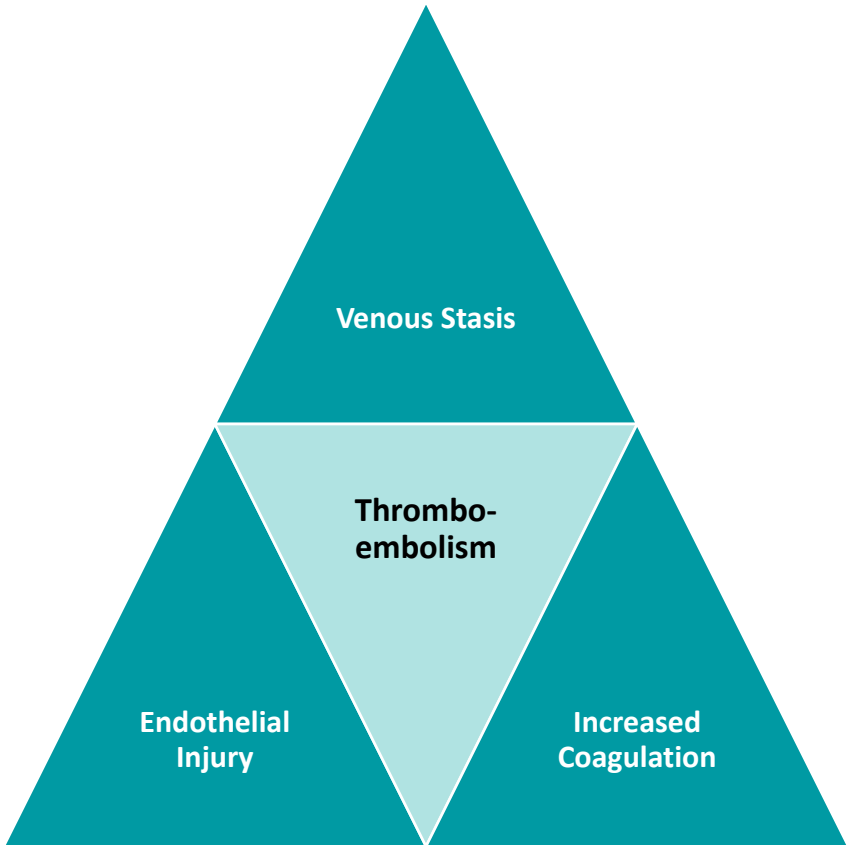
Physiologic Change	Clinical Impact	Management
Decreased functional residual capacity*	Less respiratory reserve	Earlier intubation Call experienced providers
Respiratory alkalosis	Avoid permissive hypercapnia (?)	Target PCO_2 <45 Target pH 7.35 -7.45
Increased oxygen consumption	Optimize oxygenation	Target SpO2 95% Transfuse to Hgb 7
Increased stroke volume	Preload dependent	Left uterine displacement Target euvolemia
Increased cardiac output	Ensure uterine perfusion	Target MAP 65 Monitor fetal response Avoid vasopressin (?)

*Pulmonary mechanics characterized by decreased total lung capacity, stable vital capacity, and decreased functional residual capacity.

The Kidney is Smarter than We Are

Feature	Change in Pregnancy	Clinical Relevance
Anatomy	Increase in size, physiologic dilation in collecting system	Don't be fooled by "hydronephrosis"
Filtration	Increase in GFR primarily due to increase in plasma flow (by 12 weeks)	Beware of small increases and failure to decrease creatinine
Acid-Base	Compensated respiratory alkalosis with increased bicarbonate excretion	Bicarbonate deficient state
Electrolytes	Reset osmostat increasing thirst and lowering threshold for vasopressin release	Hyponatremia is normal akin to SIADH, hypernatremia raises concern for DI due to placental vasopressin metabolism

Hemorrhage versus Thromboembolism

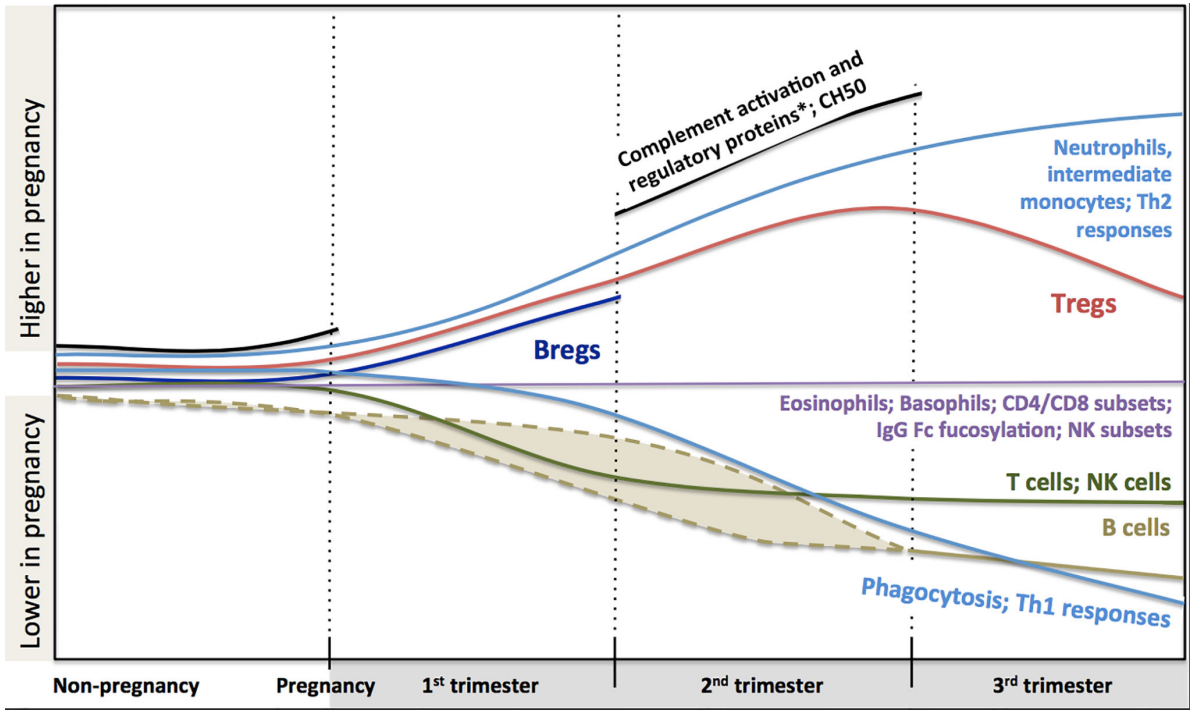


Marker	Change
Factor II, VII, VIII, X, XII	Increase
Von Willebrand factor	Increase
Protein S	Decrease
Plasminogen activator inhibitor-1	Increase
Fibrinogen	Increase

The Fetus is a Thief

- Progesterone mediated slowing of GI transit.
- Tendency towards starvation ketosis.
- Increase in plasma glucose due to placenta-mediated insulin resistance.

Immune Tolerant, Not Immunosuppressed



Characterized by increased surveillance but downregulated response with altered distribution of cellular subtypes, cytokines, and complement.

Objectives

- Describe the hallmark physiologic changes of pregnancy relevant to the intensivist.
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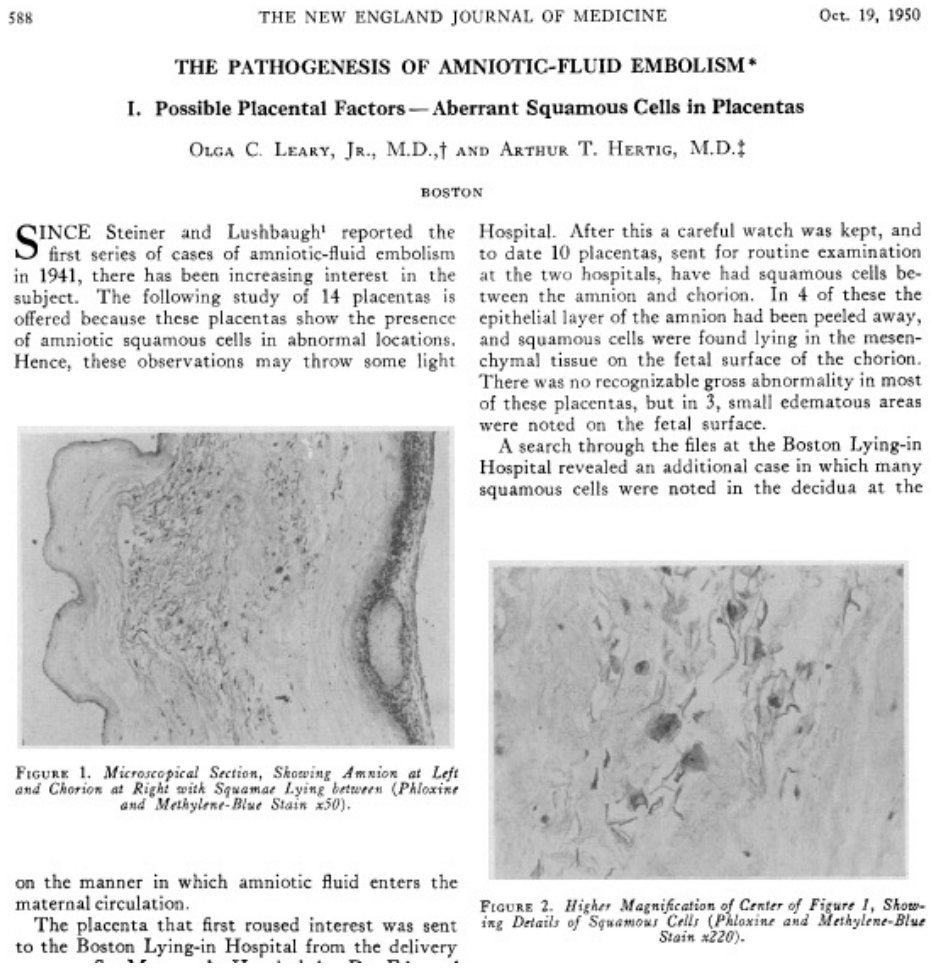
Really Fun Facts with Occasional Clinical Relevance



588 THE NEW ENGLAND JOURNAL OF MEDICINE Oct. 19, 1950

THE PATHOGENESIS OF AMNIOTIC-FLUID EMBOLISM*

I. Possible Placental Factors—Aberrant Squamous Cells in Placentas

OLGA C. LEARY, JR., M.D.,† AND ARTHUR T. HERTIG, M.D.‡

BOSTON

SINCE Steiner and Lushbaugh[1] reported the first series of cases of amniotic-fluid embolism in 1941, there has been increasing interest in the subject. The following study of 14 placentas is offered because these placentas show the presence of amniotic squamous cells in abnormal locations. Hence, these observations may throw some light on the manner in which amniotic fluid enters the maternal circulation.

The placenta that first roused interest was sent to the Boston Lying-in Hospital from the delivery Hospital. After this a careful watch was kept, and to date 10 placentas, sent for routine examination at the two hospitals, have had squamous cells between the amnion and chorion. In 4 of these the epithelial layer of the amnion had been peeled away, and squamous cells were found lying in the mesenchymal tissue on the fetal surface of the chorion. There was no recognizable gross abnormality in most of these placentas, but in 3, small edematous areas were noted on the fetal surface.

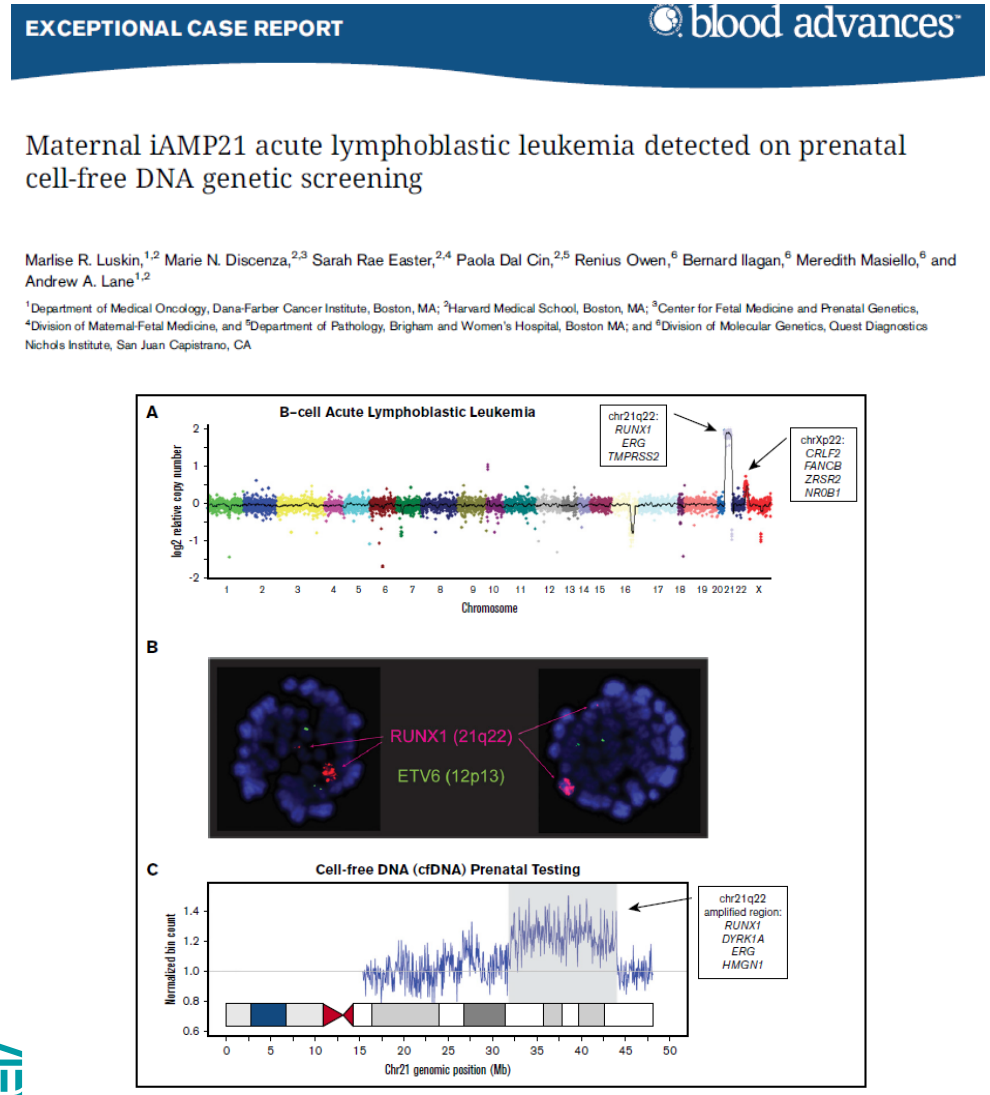
A search through the files at the Boston Lying-in Hospital revealed an additional case in which many squamous cells were noted in the decidua at the

FIGURE 1. *Microscopical Section, Showing Amnion at Left and Chorion at Right with Squamae Lying between (Phloxine and Methylene-Blue Stain x50).*

FIGURE 2. *Higher Magnification of Center of Figure 1, Showing Details of Squamous Cells (Phloxine and Methylene-Blue Stain x220).*

- The placenta is not a sieve.
  - IgG, not IgM
  - CMV, not SARS CoV-2
  - Ampicillin, not vancomycin
- One of the 2 *Listeria* outbreaks of 2022 was due to ice cream.
- Pregnancy-specific diseases have more in common with medical diagnoses than one another.
  - Amniotic fluid embolism
  - Preeclampsia
- Cell-free DNA (first studied as a marker of transplant rejection) can be a tipoff for maternal cancer.

Really Fun Facts with Occasional Clinical Relevance



EXCEPTIONAL CASE REPORT

blood advances

Maternal iAMP21 acute lymphoblastic leukemia detected on prenatal cell-free DNA genetic screening

Marlise R. Luskin,[1,2] Marie N. Discenza,[2,3] Sarah Rae Easter,[2,4] Paola Dal Cin,[2,5] Renius Owen,[6] Bernard Ilagan,[6] Meredith Masiello,[6] and Andrew A. Lane[1,2]

[1]Department of Medical Oncology, Dana-Farber Cancer Institute, Boston, MA; [2]Harvard Medical School, Boston, MA; [3]Center for Fetal Medicine and Prenatal Genetics, [4]Division of Maternal-Fetal Medicine, and [5]Department of Pathology, Brigham and Women's Hospital, Boston MA; and [6]Division of Molecular Genetics, Quest Diagnostics Nichols Institute, San Juan Capistrano, CA

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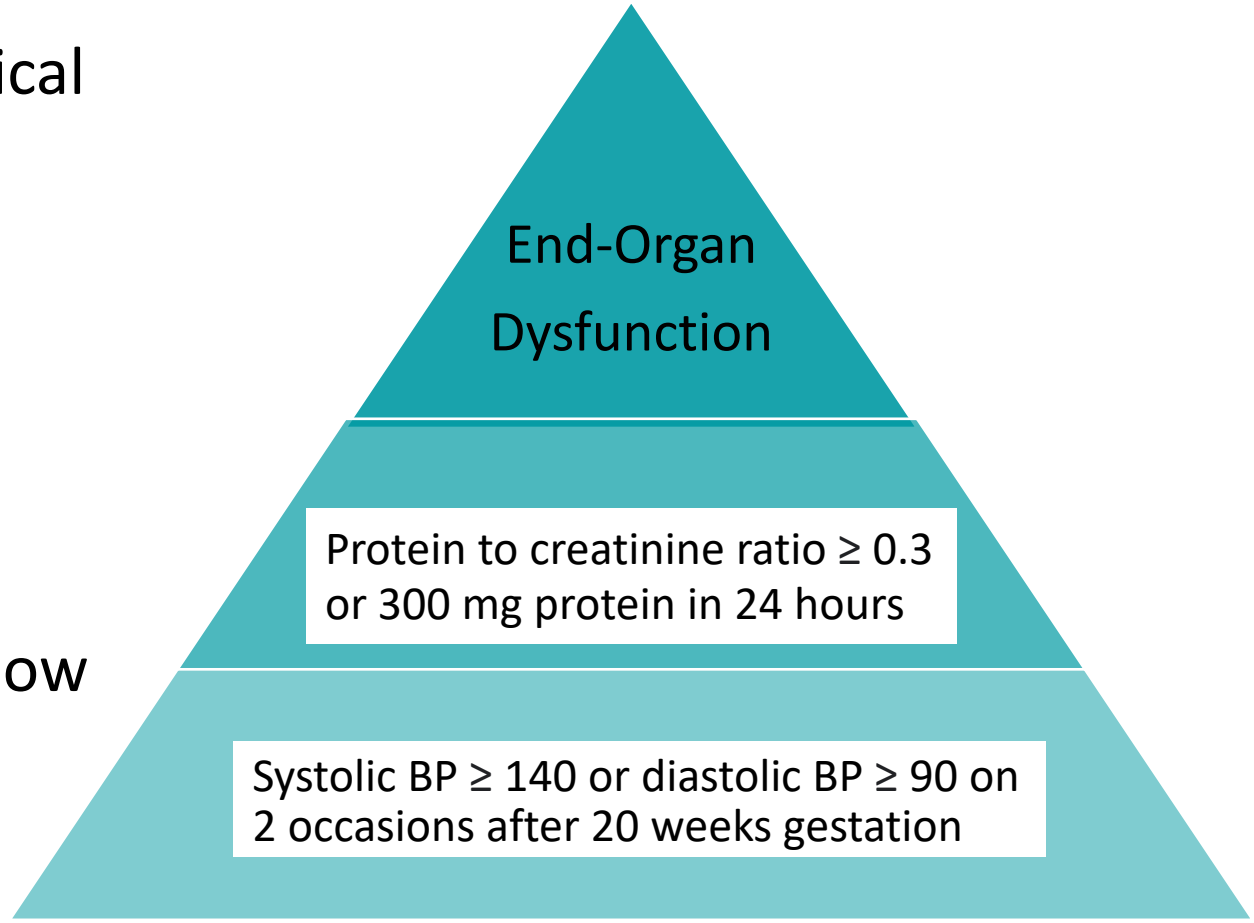
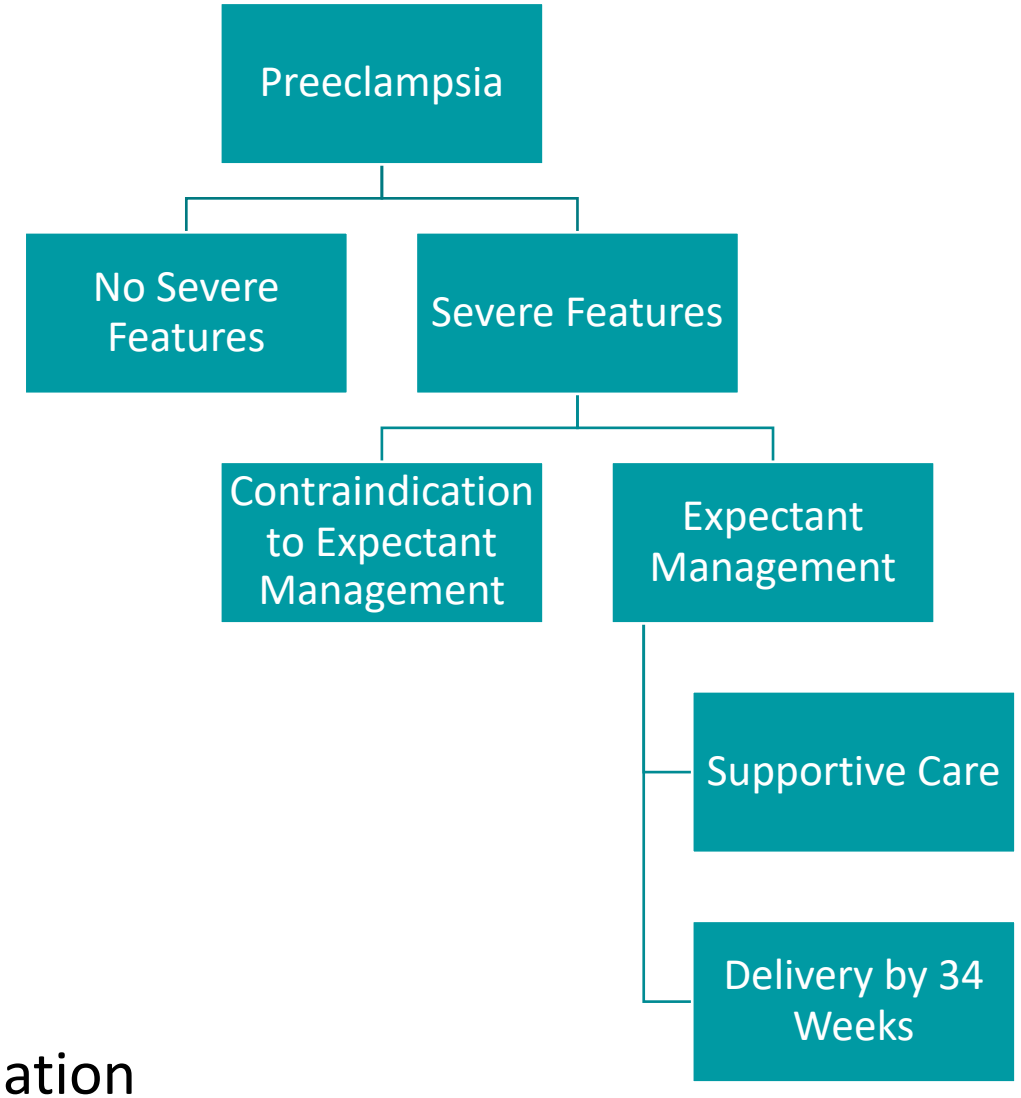
The Hallmark Disease of Obstetrics

- Clinical syndrome with a range of clinical presentations.
  - Gestational Hypertension
  - Preeclampsia
  - HELLP Syndrome
  - Acute Fatty Liver of Pregnancy
- Delivery is “curative” but postpartum presentations common
- Goal to stabilize maternal status to allow for fetal development, deliver when appropriate



Severe or Not Severe

Systolic BP ≥ 160
Diastolic BP ≥ 110
Persistent Headache
Scotomata
Stroke
Pulmonary Edema
Elevated Creatinine
Oliguria
Transaminitis
Epigastric Pain
Abruption
Stillbirth
Thrombocytopenia
Disseminated Intravascular Coagulation



Supportive Care in Preeclampsia

1. Control blood pressures
   - Systolic BP 140-160
   - Diastolic BP 90-110
2. Prevent eclampsia
   - Magnesium until stable
   - Prioritize with neurologic symptoms
3. Monitor for end-organ dysfunction
   - Inpatient monitoring
   - Labs and volume status
4. Optimize fetal status
   - Monitoring and growth
   - Steroids

Medication	Dose
Labetalol	10-20 mg IV initially
Hydralazine	5-10 mg IV initially
Magnesium	6 gm bolus then 2 gm/hr
Betamethasone	12 mg IM Q24H x 2
Dexamethasone	6 mg IM Q12H x 4

Immediate release nifedipine 10 mg PO listed as agent in available protocols in obstetric guidelines but pharmacokinetics, side effects, and safety should limit use.

Eclampsia

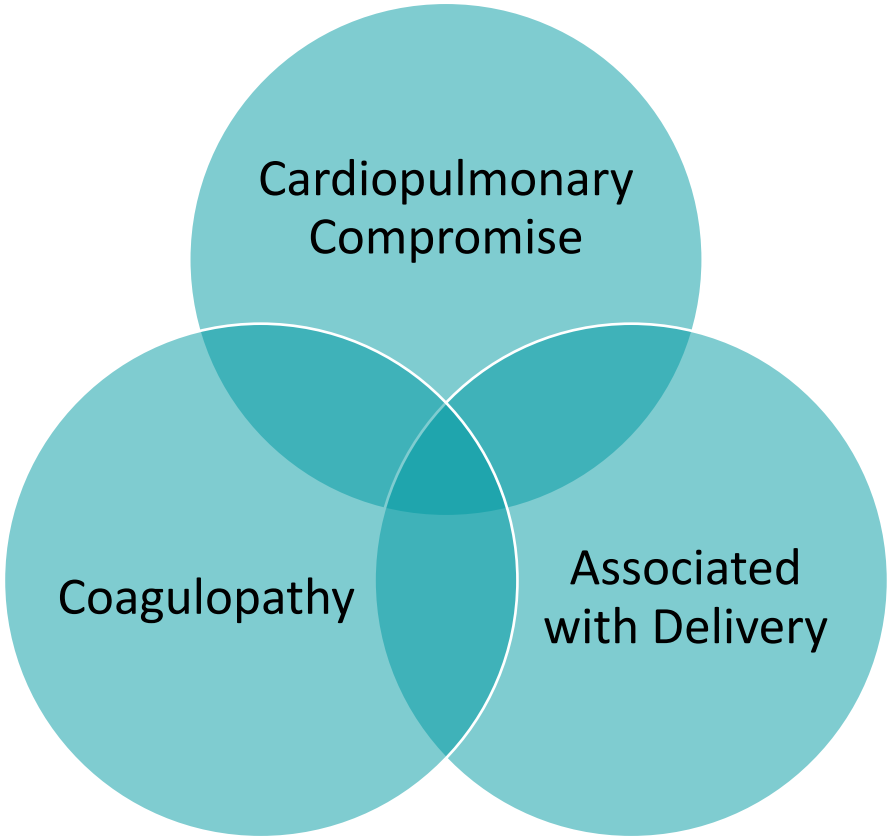
- Self-terminating generalized tonic clonic seizure
  - Supplemental O_2
  - Left lateral position
  - Ignore the fetus
- Magnesium given for prevention, not termination of seizure
  - Rebolus 2-4 gm if recurrence
  - Monitor for toxicity
  - Broaden differential
  - Low threshold for neuroimaging
- Proceed with delivery when stable

Mg Range	Clinical Status
4-7 mEq/L	"Therapeutic"
>7 mEq/L	Patellar reflexes lost
>10 mEq/L	Respiratory depression
>25 mEq/L	Cardiac arrest

Mg levels not checked routinely in clinical practice but should be considered in setting of impaired clearance, recurrent seizures, or cardiac arrest.

Mg use associated with pulmonary edema in literature but concern for confounding by indication.

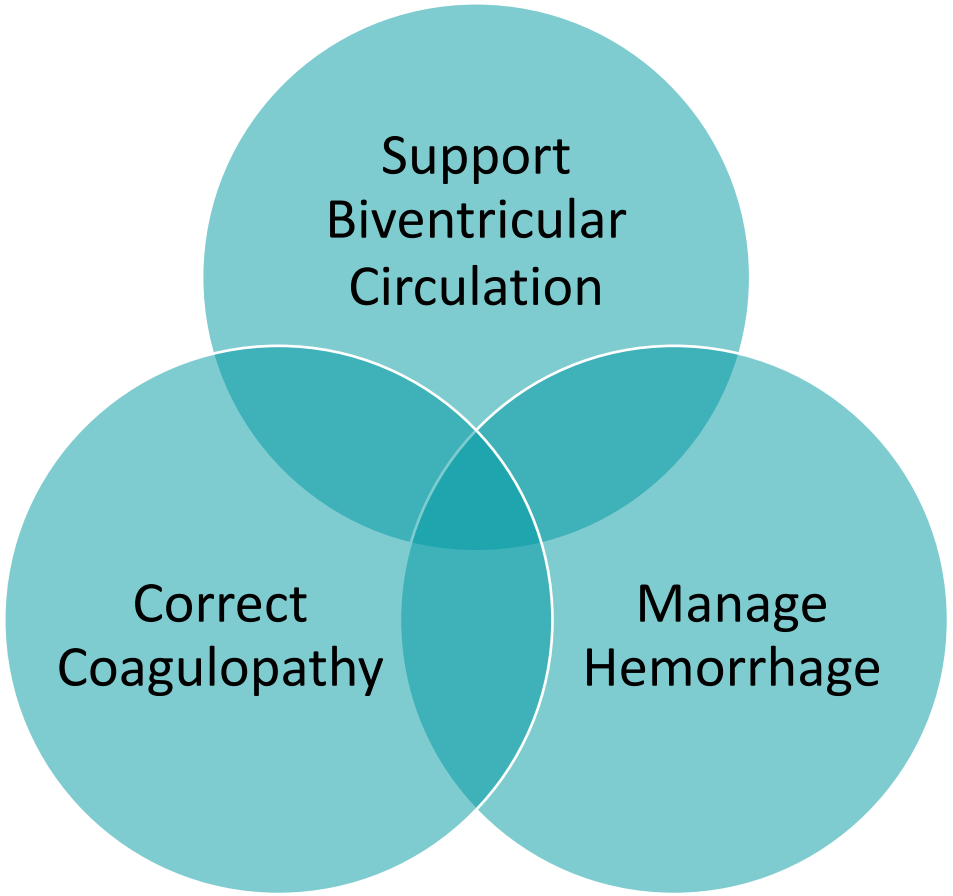
Amniotic Fluid Embolism



- Sudden onset of cardiorespiratory arrest OR hypotension with evidence of respiratory compromise
- Documentation of overt DIC prior to hemorrhage to exclude hemorrhage-related coagulopathy
- Clinical onset during labor or within 30 minutes of placental delivery.
- Absence of fever (≥38°C) during labor.

Roughly 50% of cases reported to national registry meet criteria for typical AFE while 25% of cases are not considered AFE on independent review.

Management of Amniotic Fluid “Embolism”



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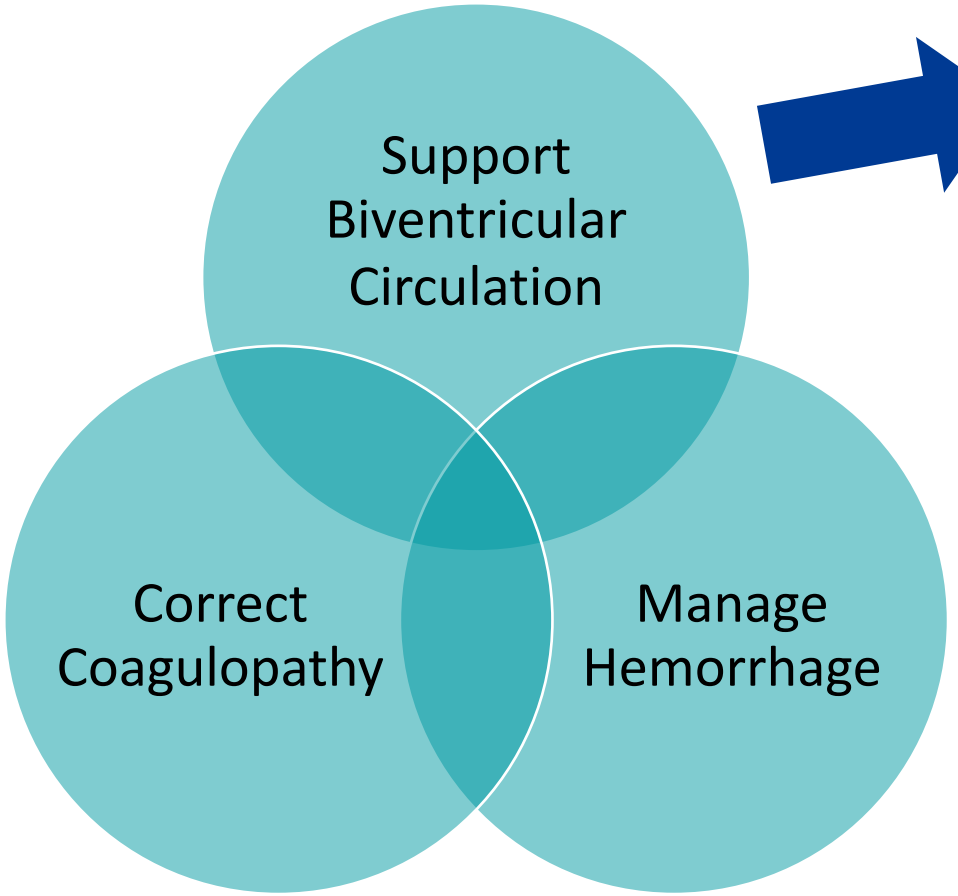
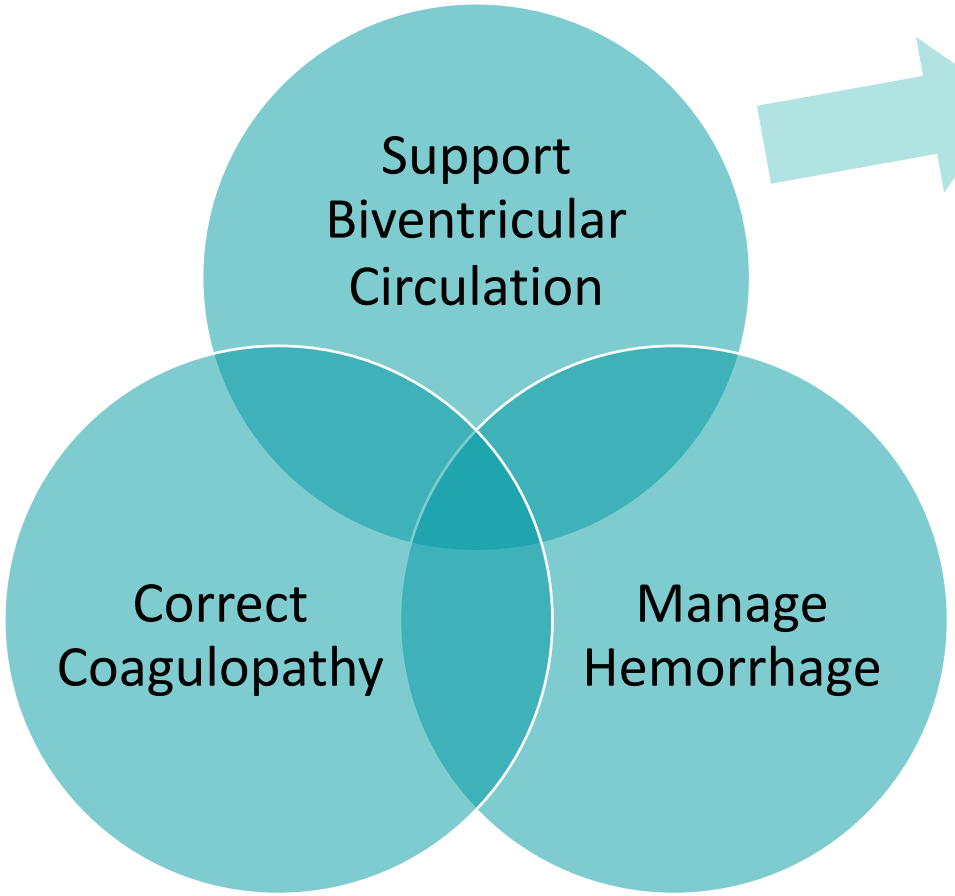


- ACLS modified for pregnancy
- Early norepinephrine use
- Consider dobutamine
- Assess RV with TTE
- Early intubation
- Pulmonary vasodilators
- Consider MCS

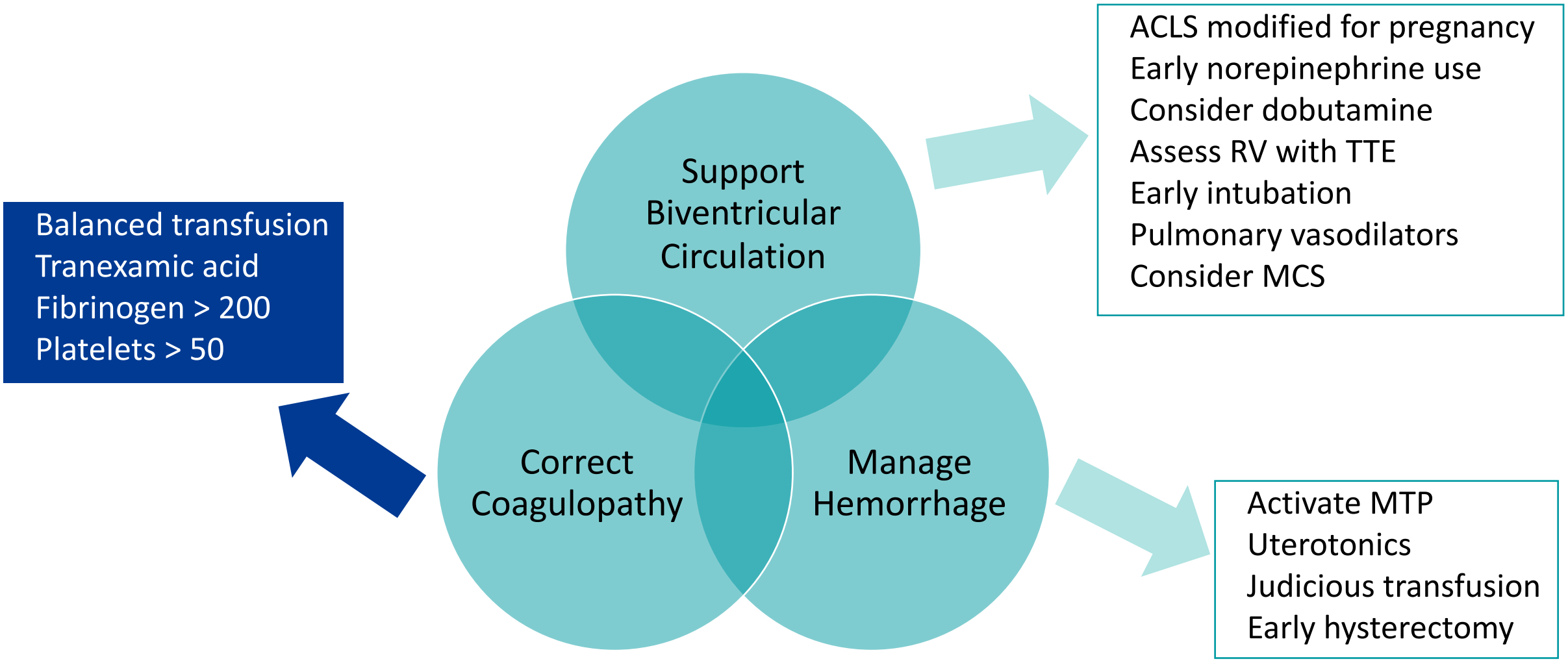
Management of Amniotic Fluid “Embolism”



ACLS modified for pregnancy
Early norepinephrine use
Consider dobutamine
Assess RV with TTE
Early intubation
Pulmonary vasodilators
Consider MCS

Activate MTP
Uterotonics
Judicious transfusion
Early hysterectomy

Management of Amniotic Fluid "Embolism"



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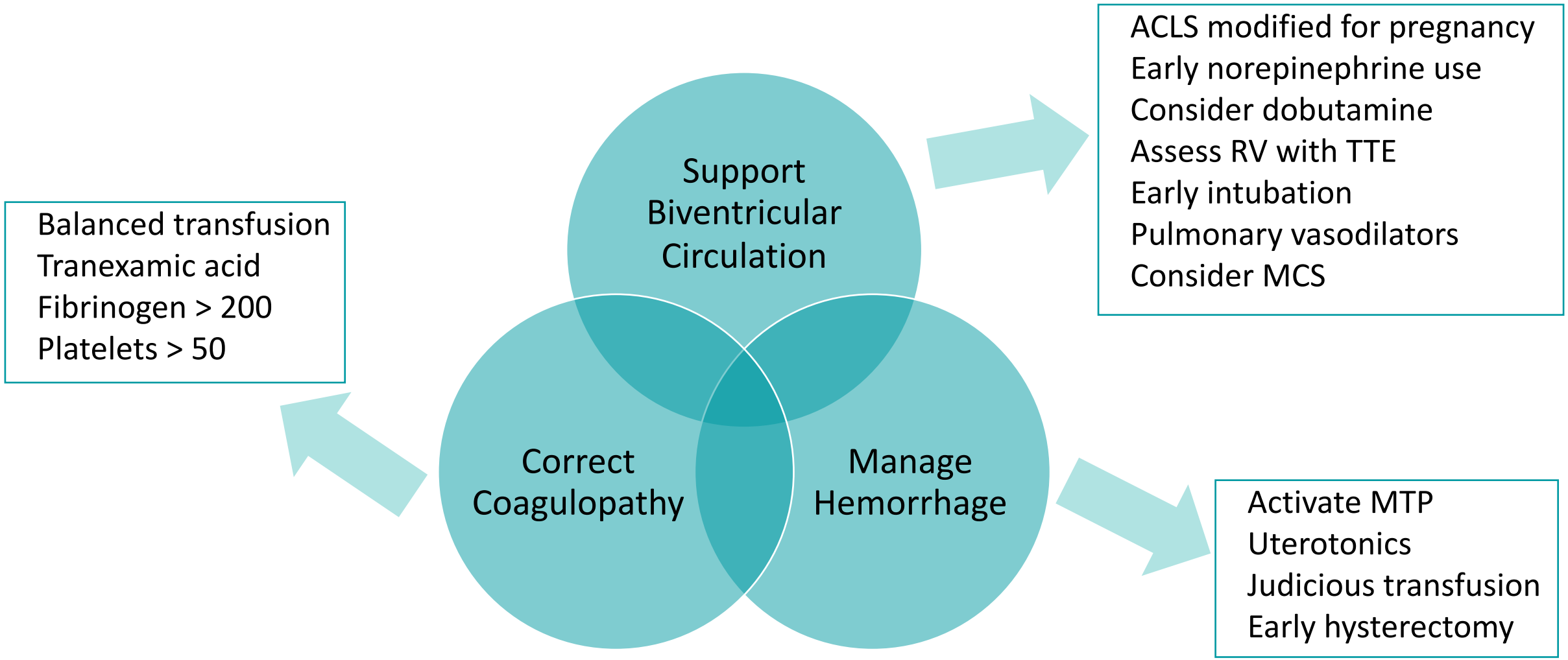
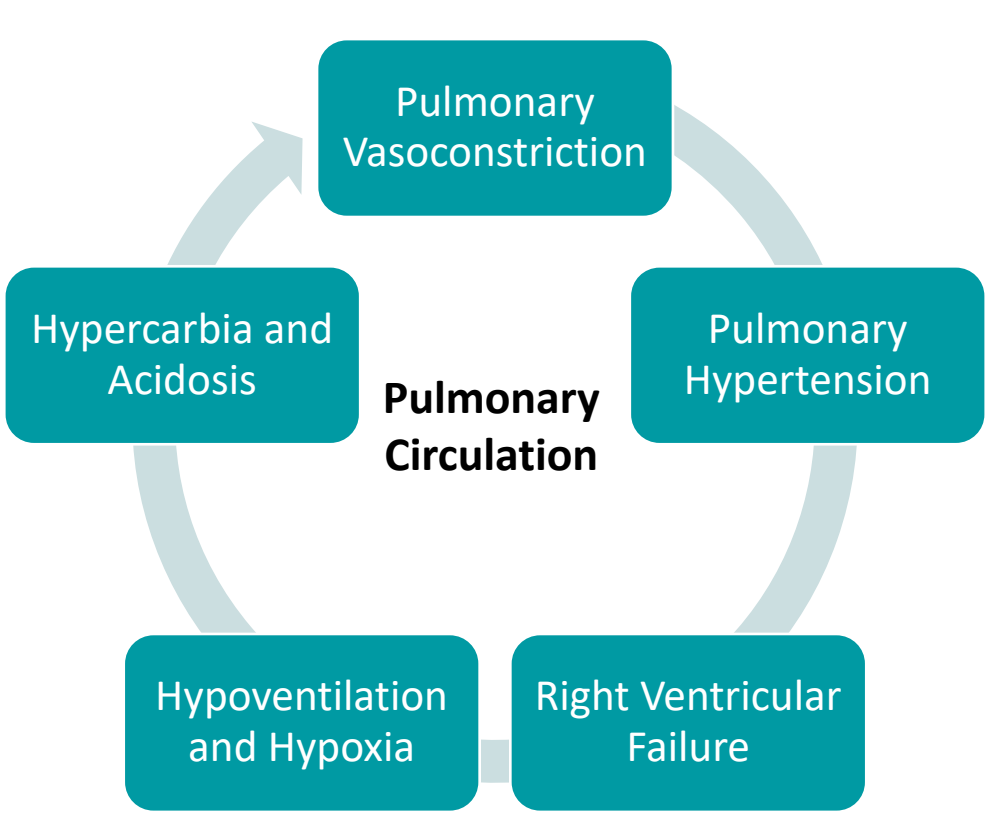
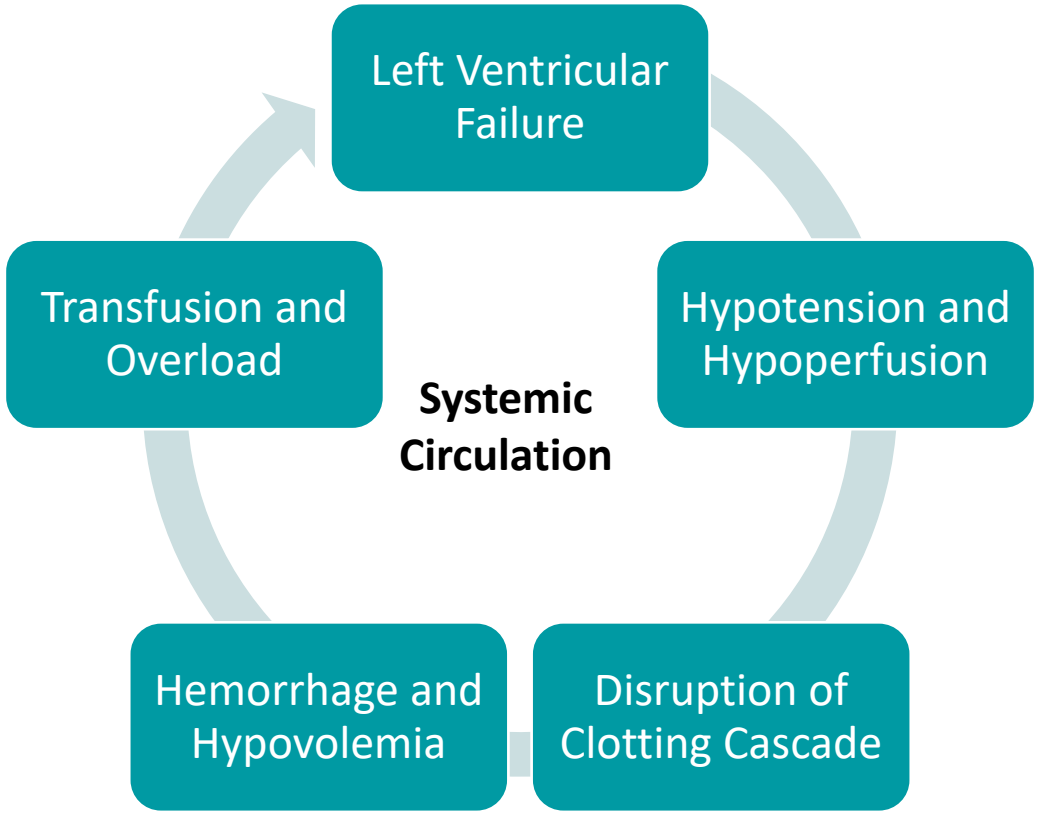


Hemodynamics in Amniotic Fluid Embolism





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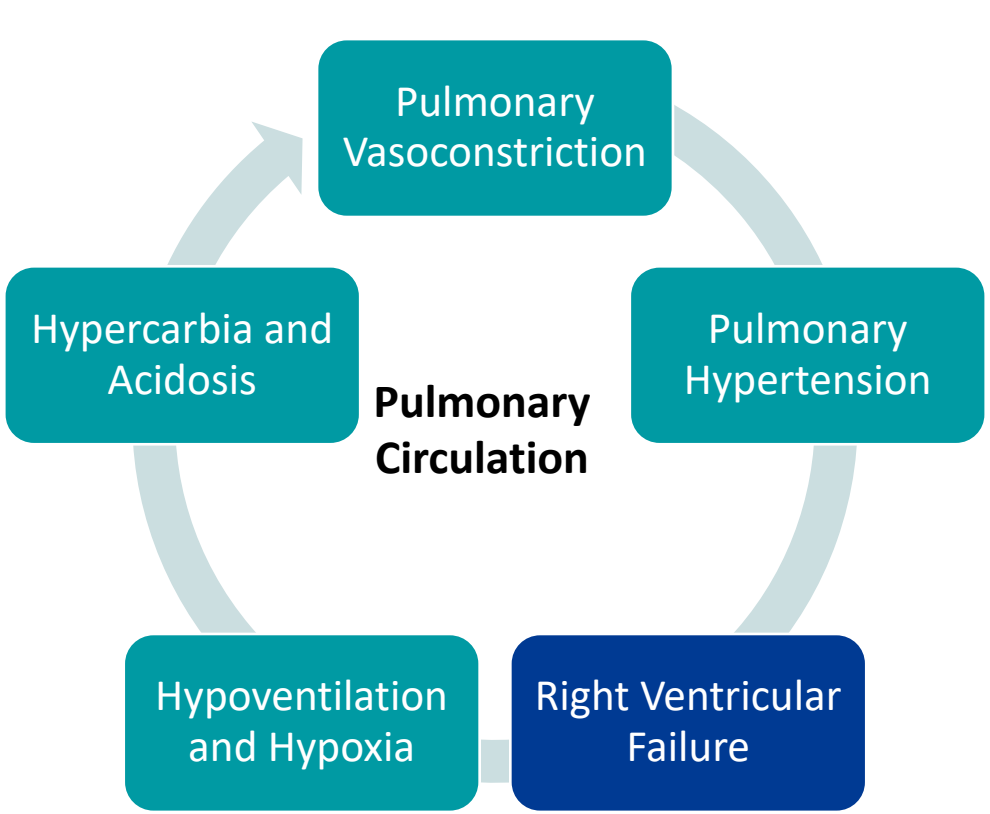
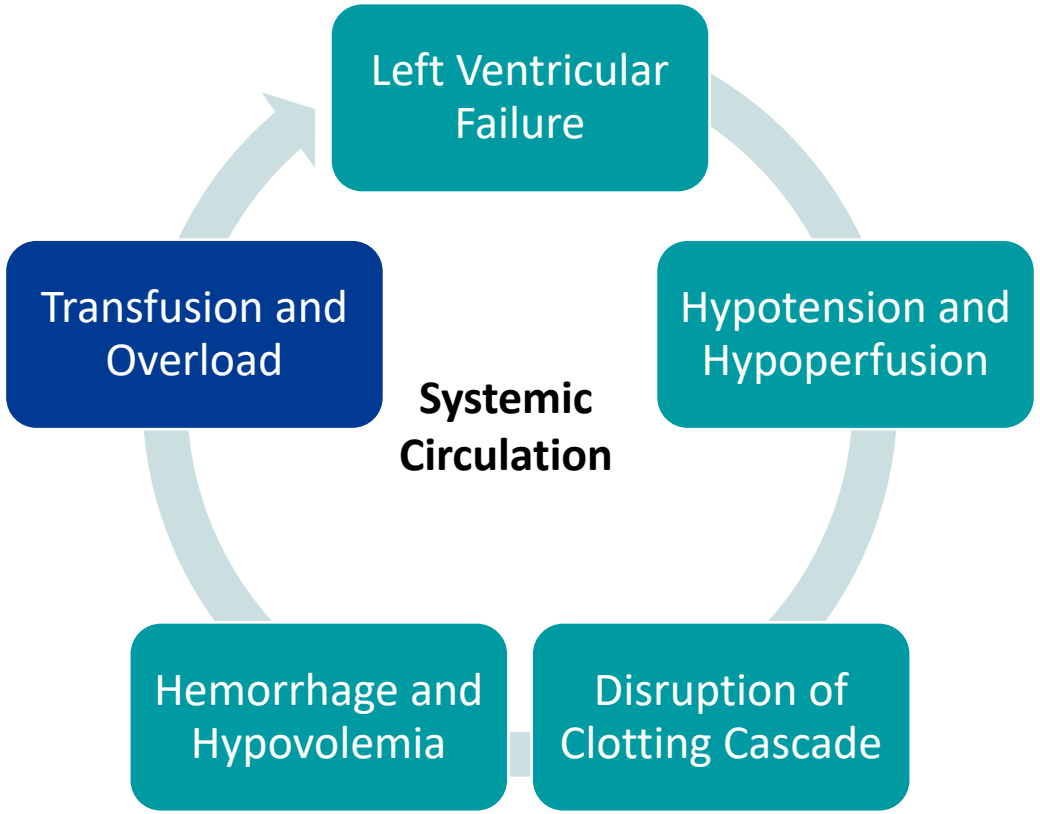
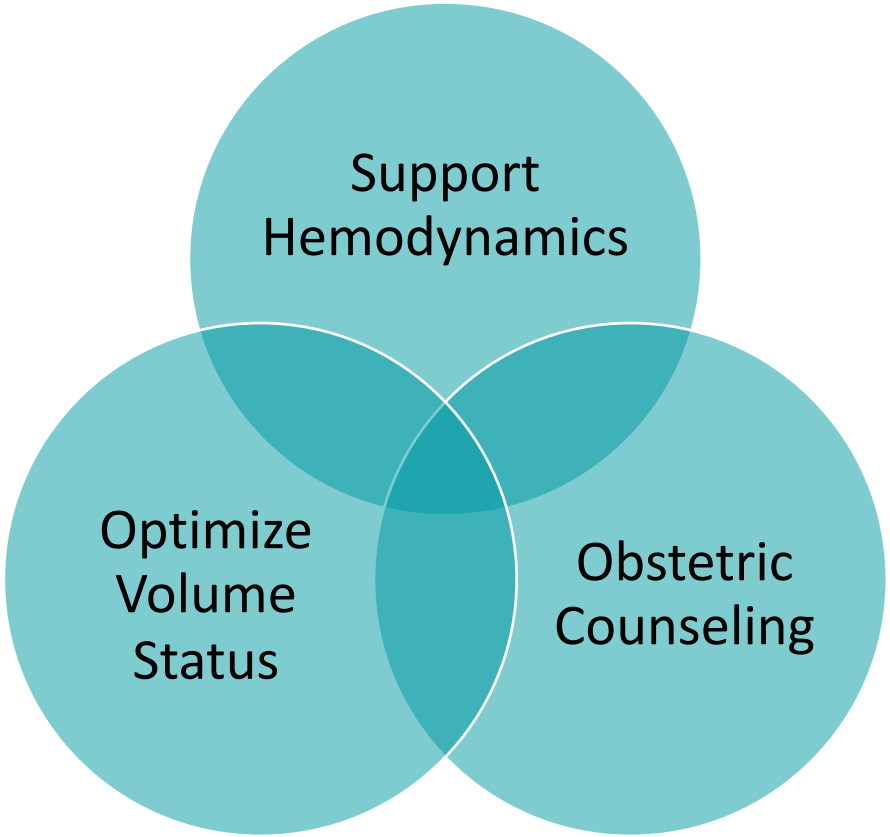




Peripartum Cardiomyopathy



1. Support breastfeeding ***goals***.
2. Ensure close clinical follow up as recovery of EF dictates safety of another pregnancy.
3. Consider genetic evaluation.

- Heart failure secondary to left ventricular systolic dysfunction with left ventricular ejection fraction (LVEF) < 45%.
- Occurrence towards the end of pregnancy or in the months following delivery (mostly in the month following delivery).
- No other identifiable cause of the heart failure.

Objectives

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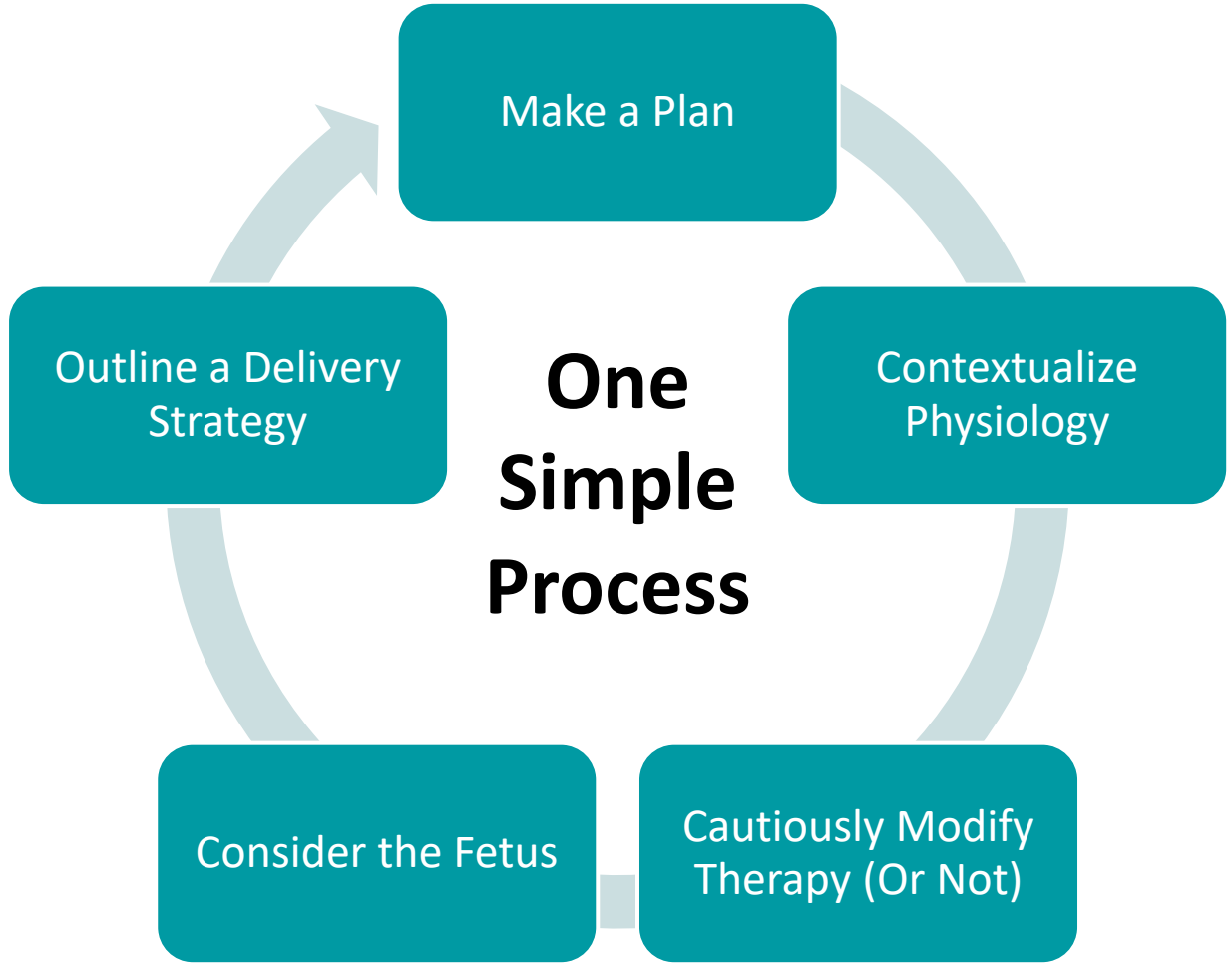
One-Slide Maternal Fetal Medicine

Two Easy Rules

1) There is no maternal benefit to pregnancy.
2) The health of the fetus depends on the health of the mother.

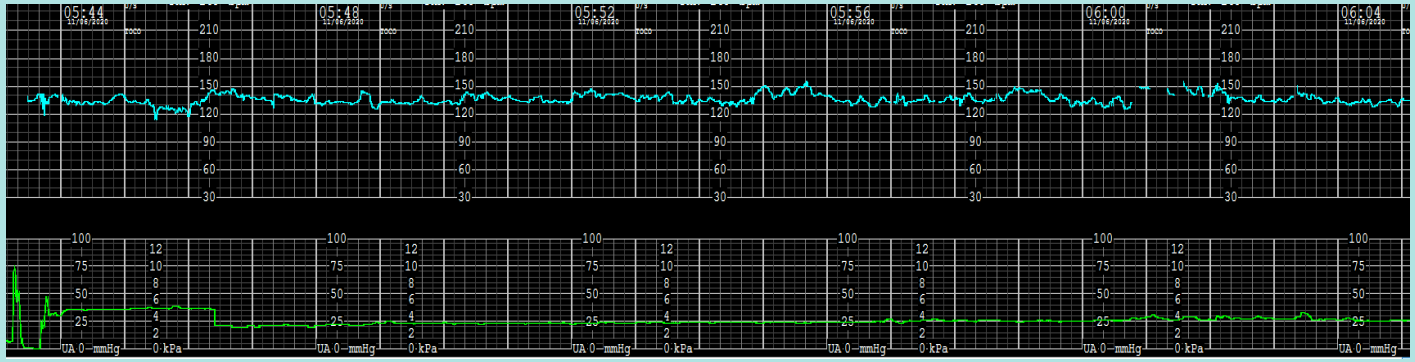


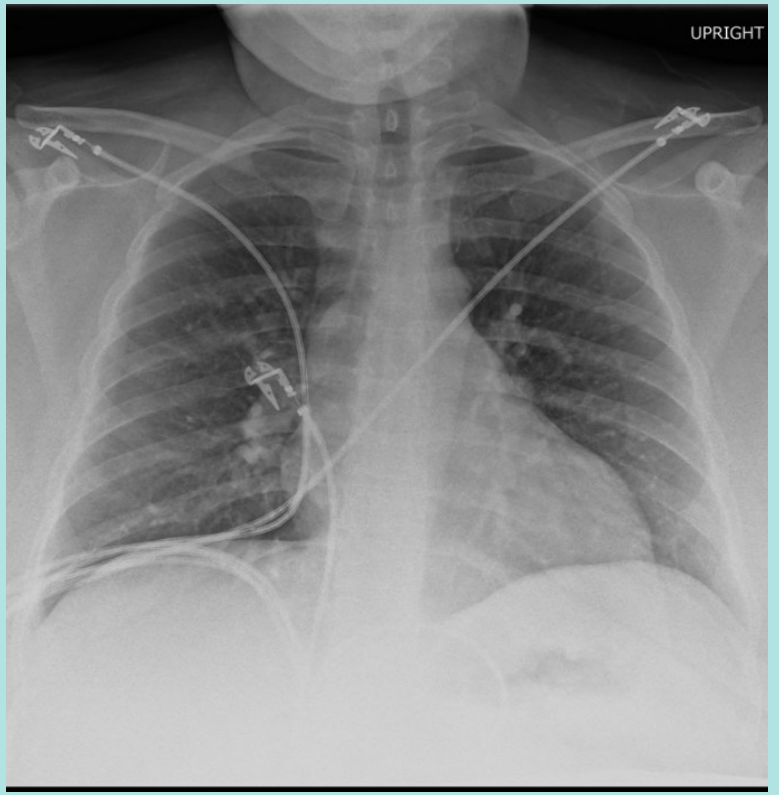
Consider a Case

34-year-old White, Hispanic, bilingual publicly-insured G7P3033 at 33w4d presents to the ED with worsening shortness of breath 9 days after first testing positive for SARS-CoV-2 via PCR in November 2020.

She reports an uncomplicated pregnancy with three prior term vaginal births of babies in the 7 pound range. Her medical history is notable for mild intermittent asthma.

VS: T 99.1, HR 120, BP 123/73, RR 26, O_2 94% on room air
Labs: AST/ALT 180/195, CRP 92.3, procalcitonin 18.43





Champion the Standard of Care

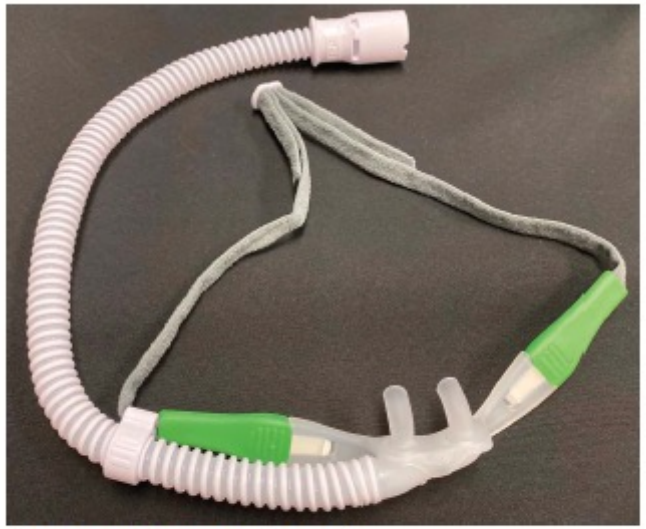
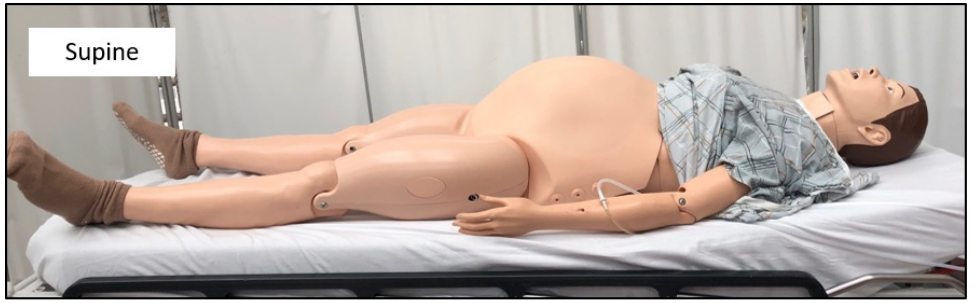
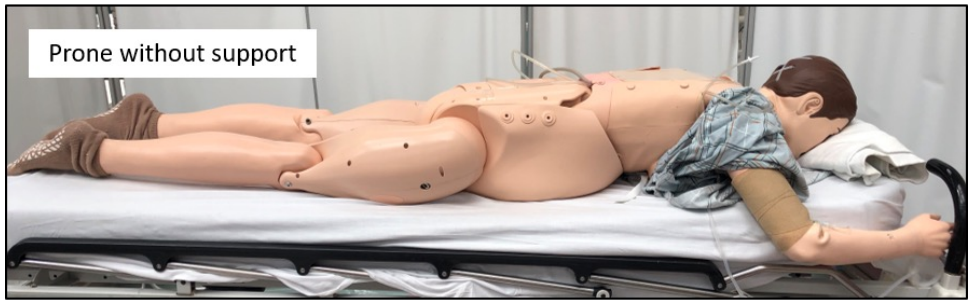


Fig. 1. High-flow nasal cannula.

Pacheco. Respiratory Support for Pregnant Patients With COVID-19. Obstet Gynecol 2020.





Journal of the American Heart Association

SYSTEMATIC REVIEW AND META-ANALYSIS

Extracorporeal Life Support in Pregnancy: A Systematic Review

Emily E. Nacoum, MD; Andrew Chalupka, MD, MBA; Jonathan Haft, MD; Mark MacEachern, MLIS; Cosmas J. M. Vandeven, MD; Sarah Rae Easter, MD; Michael Maile, MD, MS; Brian T. Bateman, MD, MSc; Melissa E. Bauer, DO

Modify Approach through the Lens of Physiology

Increasing oxygenation
Worsening ventilation
Increasing vasopressors
Worsening acidemia
New onset hypertension
New tachycardia or arrhythmia
Unexplained increase in sedation
Vaginal bleeding or leaking

BRIGHAM HEALTH
BRIGHAM AND WOMEN'S HOSPITAL

OB Clinical Team

Clinician*	Contact	Indication
Senior OB Resident	Pager 32074	Routine Questions Change in Clinical Status†
OB Attending	Pager 13212	Obstetric or Medical Emergencies Clinical Concerns
Labor and Delivery Nurse in Charge	Pager 11382	Coordinate Fetal Monitoring or RN Support Notification of Emergent Cesarean Delivery
Code Blue OB Team	STAT Line	Spontaneous Vaginal Delivery Maternal Cardiac Arrest
Maternal-Fetal Medicine Attending	Pager 38557	Non-Emergent Clinical Concerns

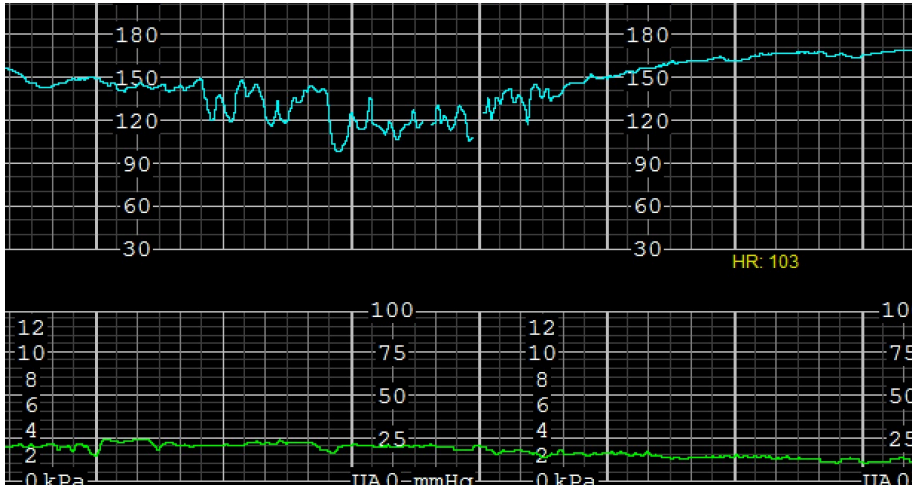
*Clinicians all carry virtual pagers and are in house 24/7. The MFM Attending is on home call at night and weekends.
†Adopt a low threshold to call OB with any questions, concerns, or change in clinical status.

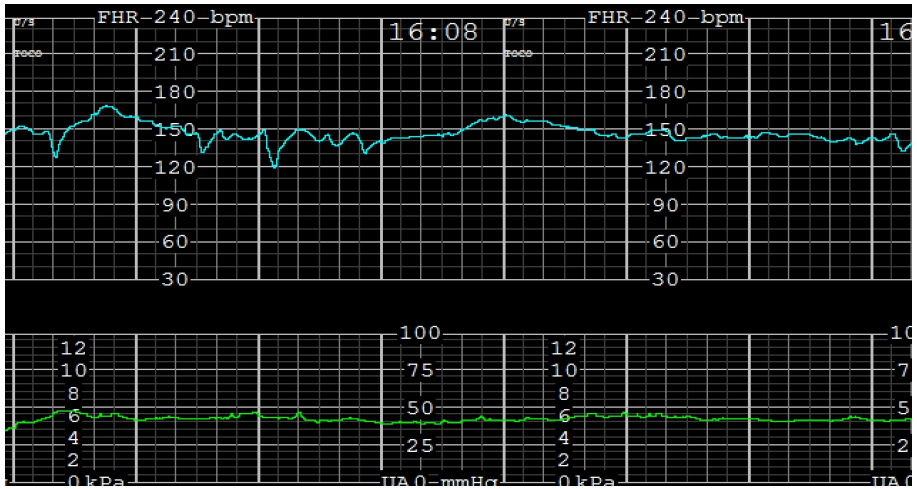
Suggestions for Notification of Change in Clinical Status‡

Clinical Change	Suggested Target§
Increasing oxygenation requirement	$SpO_2 > 95\%$ or $PaO_2 > 70$ mmHg
Worsening ventilation	$pCO_2 < 45$ and $pH > 7.35$
Increasing vasopressor requirement	MAP > 65
Worsening acidemia	pH < 7.30
New onset hypertension with SBP > 160 or DBP > 100	
New onset tachycardia (possible sign of labor) or arrhythmia	
Unexplained increase in sedation requirement based on RASS or BIS (possible sign of labor)	
Obstetric issues such as vaginal bleeding or leakage of amniotic fluid	

‡This list is not exhaustive but includes scenarios that may benefit from multidisciplinary management or could warrant increased fetal monitoring.
§These targets are far from absolute and are designed as a starting point from which to individualize care.

Make a Plan to Monitor the End-Organ





Parameter	Causes of Abnormalities
Baseline	Maternal heart rate Maternal temperature Medications
Variability	Acidosis Medications Sleep Cycle Hypoxia
Decelerations	Hypoperfusion / hypovolemia Placental insufficiency Cord compression Labor
Accelerations	Reassuring when present Often absent due to sedation

Hope for the Best…But Plan for Everything

- Establish Goals of Care
  - Anticipated trajectory
  - Gestational age and weight
- Outline Considerations for Delivery
  - Spontaneous labor
  - Emergent fetal indication
  - Maternal indication
  - Maternal cardiac arrest
- Craft the Ultimate Birth Plan
  - Neuraxial analgesia Preferred
  - Vaginal delivery prioritized
  - Resources determine approach

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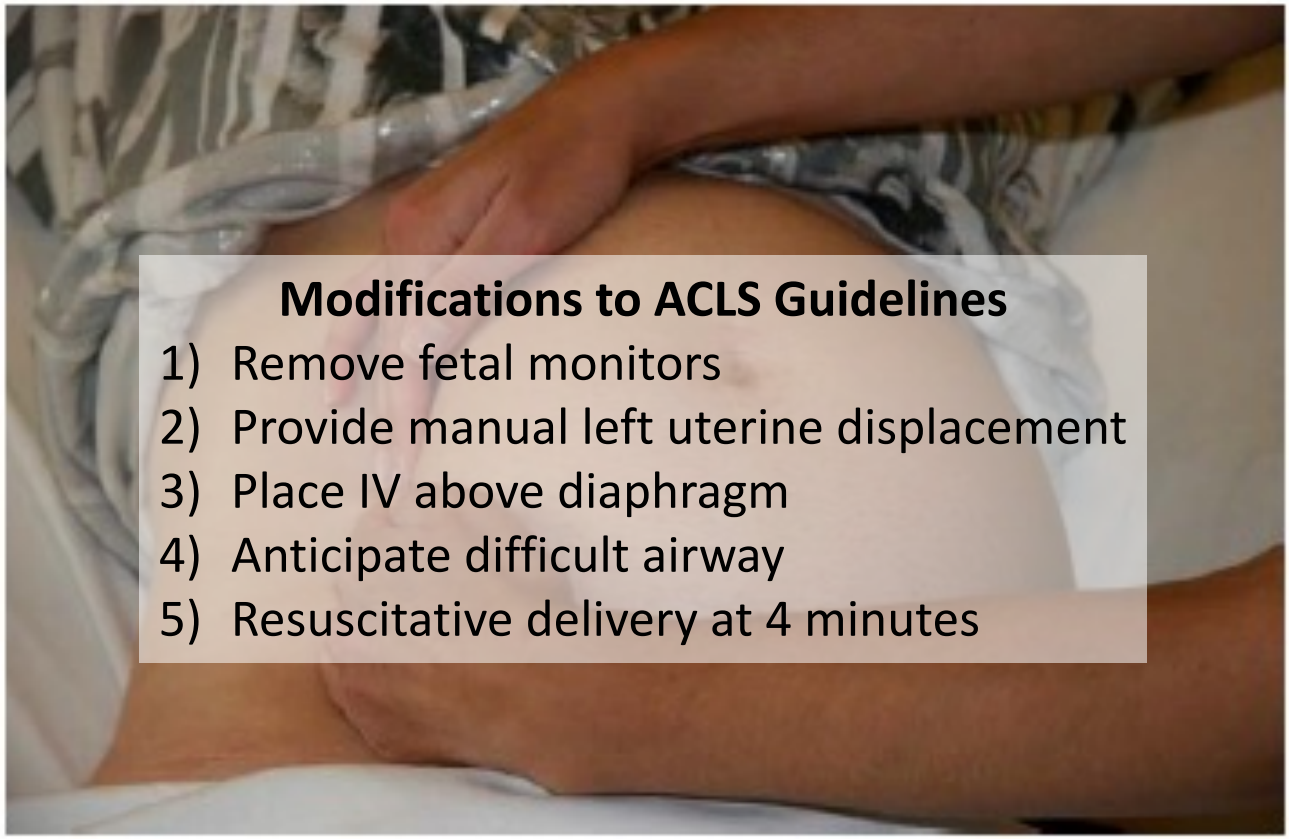

Let's Return to Our Patient

She is admitted to the medicine service and maternal-fetal medicine and ID are consulted. She is started on remdesivir and dexamethasone. Her oxygen needs escalate from requiring the oximizer to the high-flow nasal cannula within a few hours of admission. She is made NPO but her oxygen stable oxygen needs of 60L HFNC to achieve SPO_2 95%.

It's now hospital day 2 and you are notified of an impending admission of a pregnant patient. The team is requesting intubation and transfer to the ICU based on increased work of breathing. Her hemodynamics are overall stable but she is increasingly tachypneic with current respiratory rate of 44.

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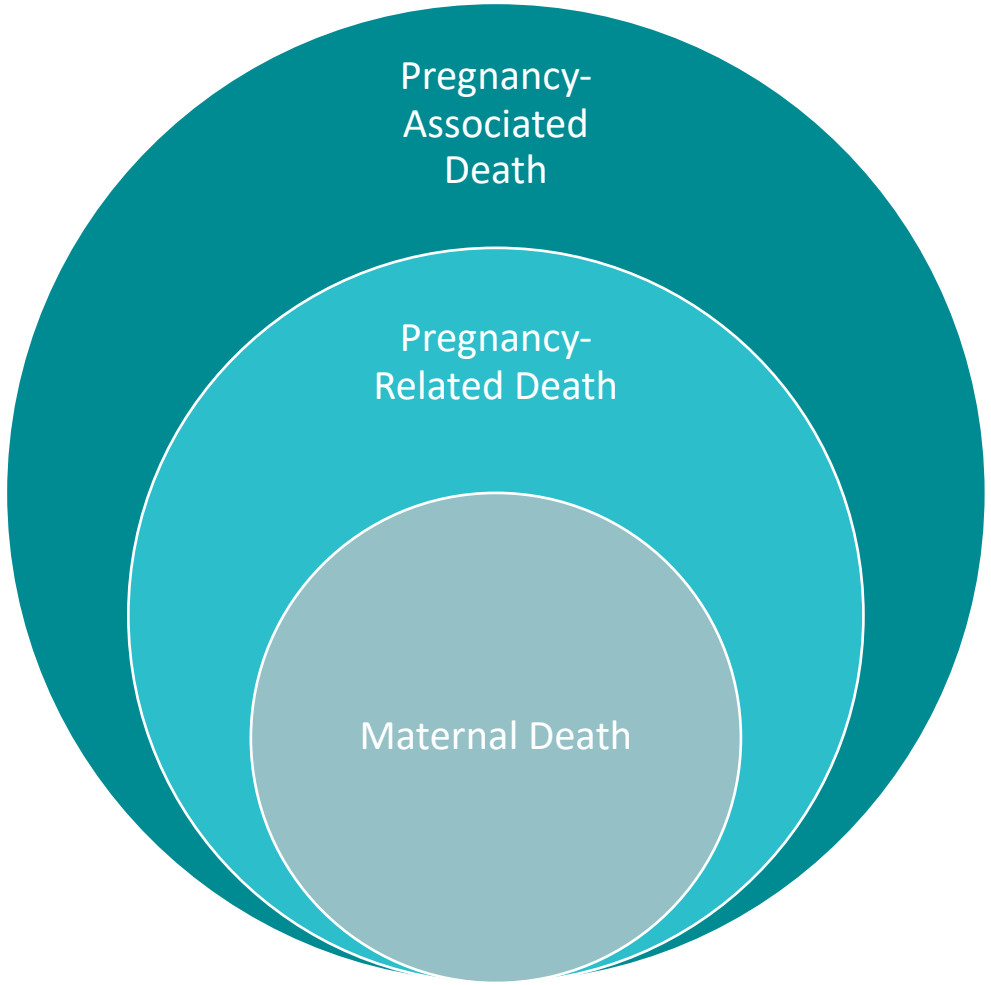
She undergoes uncomplicated RSI with some initial fetal bradycardia with induction but resolved with left uterine displacement and brief use of phenylephrine. You meet her at the bedside on arrival to the ICU and begin reviewing labs.

Her ABG returns with pH 7.40, PCO_2 23, PaO_2 111, HCO_3 15, with AG 20.

Review the Case

The Controversial Outcome of Death

- **Pregnancy-Associated Death:**
  - Person dies in an earthquake the day before the baby's first birthday.
- **Pregnancy-Related Death:**
  - Death due to peripartum cardiomyopathy 12 weeks after delivery.
- **Maternal Death:**
  - Death in the setting of hemorrhage after delivery for chorioamnionitis.



The Controversial Outcome of Death – and You

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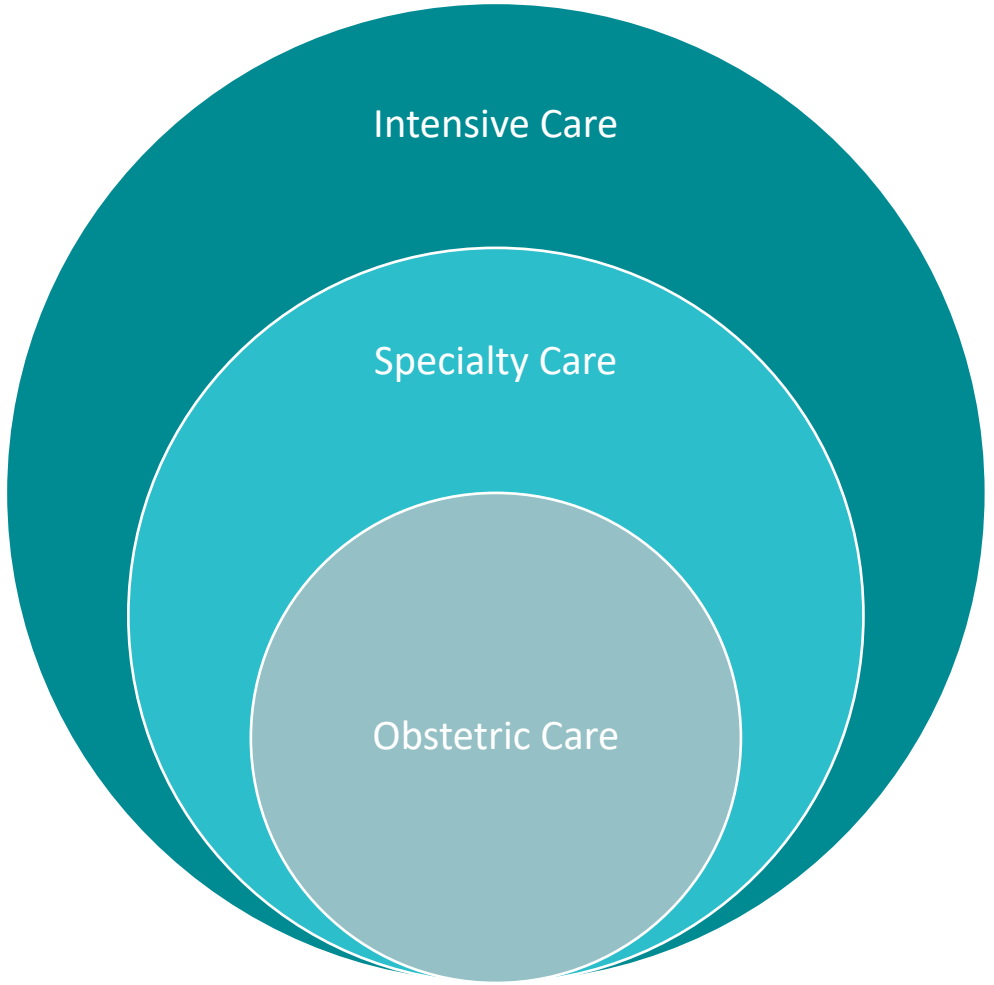

Regionalized **Maternity** Care to Reduce Maternal Mortality

- Paradigm to ensure that people deliver at hospitals equipped with resources and personnel to manage their anticipated needs
- Collaboration between regional care centers and local community
  - Monitoring outcomes
  - Quality improvement
  - Robust systems for the unanticipated
- Concentrating complex care to maintain expertise and optimize outcomes
  - Placenta accreta spectrum
  - Cardiovascular disease
  - Critical care

The More You Do, The Better You Are

TABLE 3
Blood-related outcomes in a subgroup analysis on subjects with greater depth of invasion

	Placenta increta/percreta		
	T1 (n = 48)	T2 (n = 42)	*P* value
Estimated blood loss, mL, median (Q1, Q3)	2000 (1500, 3000)	1350 (1000, 2000)	<.01[a]
RBC transfusion units, median (Q1, Q3)	3 (1, 7)	0 (0, 3)	<.01[a]
Platelet transfusion units, median (Q1, Q3)	0 (0, 0)	0 (0, 0)	.04[a]
FFP transfusion units, median (Q1, Q3)	0 (0, 3)	0 (0, 1.2)	.04[a]
RBC transfusion, n (%)	38 (79.2)	17 (40.5)	<.01[a]
RBC transfusion unit ≥ 4, n (%)	22 (46.8)	9 (21.4)	.01[a]
RBC transfusion unit ≥ 8, n (%)	11 (23.4)	5 (11.9)	.16
RBC transfusion unit ≥ 10, n (%)	6 (12.8)	2 (4.8)	.27
MTP, n (%)	14 (29.2)	1 (2.4)	<.01[a]

Values are presented as mean ± SD (independent *t* test), median (IQR) (Mann-Whitney *U* test), and n (%) (χ^2/Fisher exact test).

Adjusted *P* values are calculated (for parameters age, BMI, and gestational age) with analysis of covariance, Kruskal-Wallis test, and regression analysis, when needed.

BMI, body mass index; *FFP*, fresh-frozen plasma; *IQR*, interquartile range; *MTP*, massive transfusion protocol; *RBC*, red blood cell; *SD*, standard deviation.

[a] Statistically significant.

Shamshirsaz et al. Multidisciplinary team learning in the management of MAP. Am J Obstet Gynecol 2017.

What is Obstetric Critical Care?

Viewpoint ajog.org

The "virtual" obstetrical intensive care unit: providing critical care for contemporary obstetrics in nontraditional locations

Michael P. Leovic, MD; Hailey N. Robbins, MD; Michael R. Foley, MD; Roman S. Starikov, MD

Intensive Care Unit	Skills and Services	Labor and Delivery
Hemodynamic Monitoring	Continuous Assessment	Fetal Monitoring
Vasopressors	Medication Titration	Pitocin
Code Status	Goals of Care	Prenatal Diagnosis
Cardiopulmonary Arrest	Crisis Management	Obstetric Hemorrhage
End of Life	Family-Centered Care	Life's Beginning
Complex and Urgent	Decision Making	Complex and Urgent

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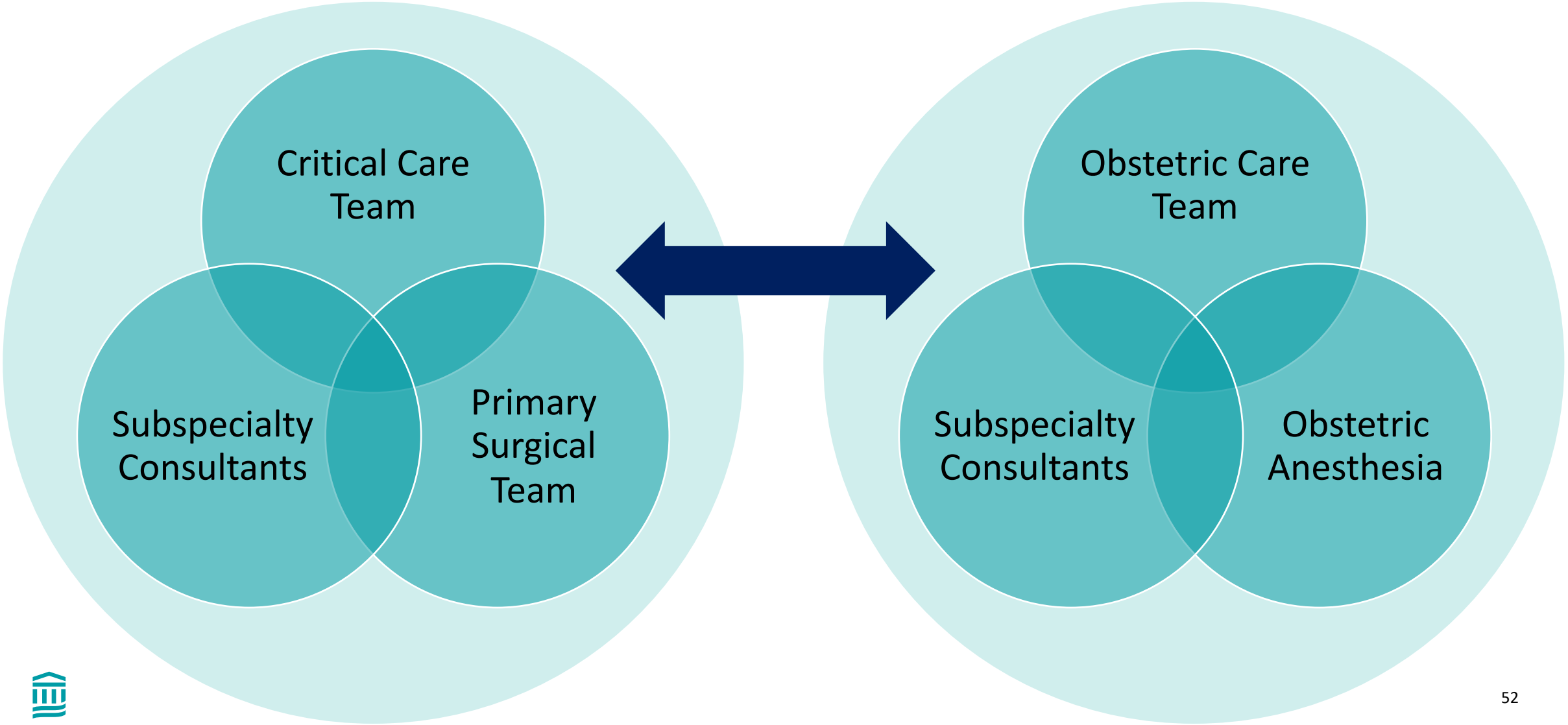
"Gisvel was able to not only meet the patient's complex medical needs as a person with severe COVID disease, but she was able to understand the unique needs of a pregnant woman who was also critically ill. Most importantly, Gisvel understands the concerns of pregnant women. The patient was heavily sedated, with no family to comfort her. Gisvel was able to talk to the patient and reassure her as much as possible that her baby was safe and well and that they were both being cared for to the best of our abilities."

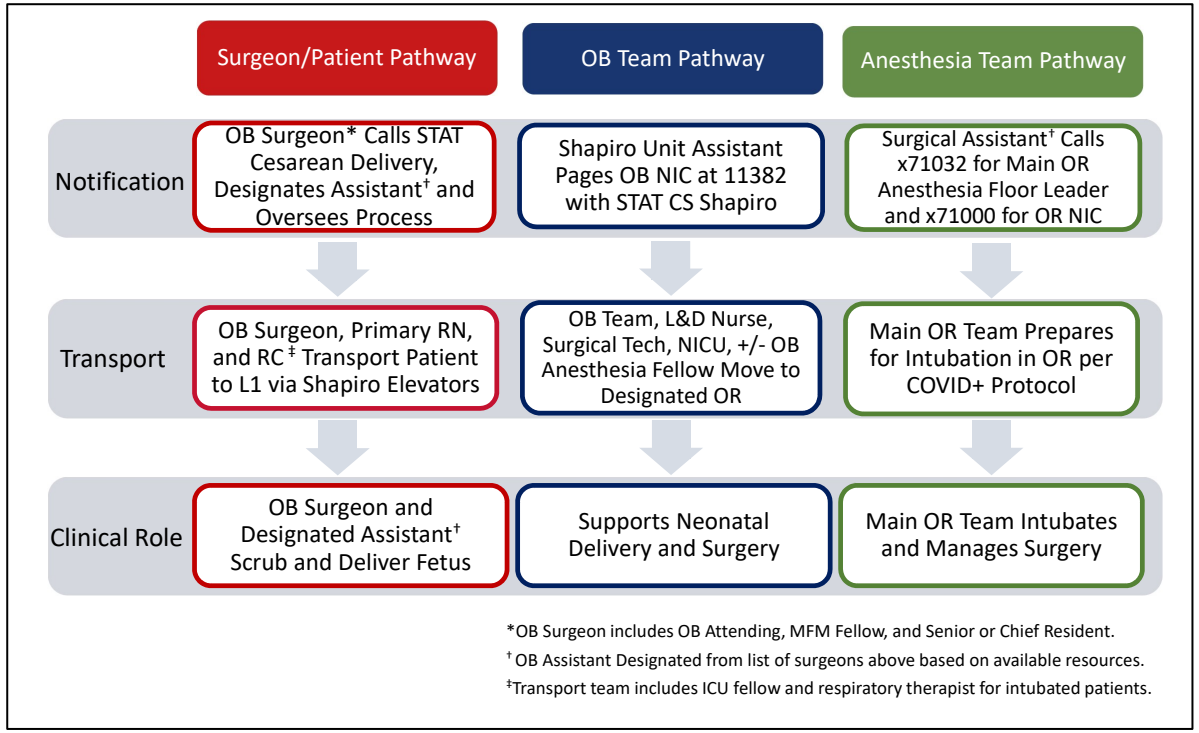
-Kathleen Whelton RN

The ICU is a Mindset, Not a Place

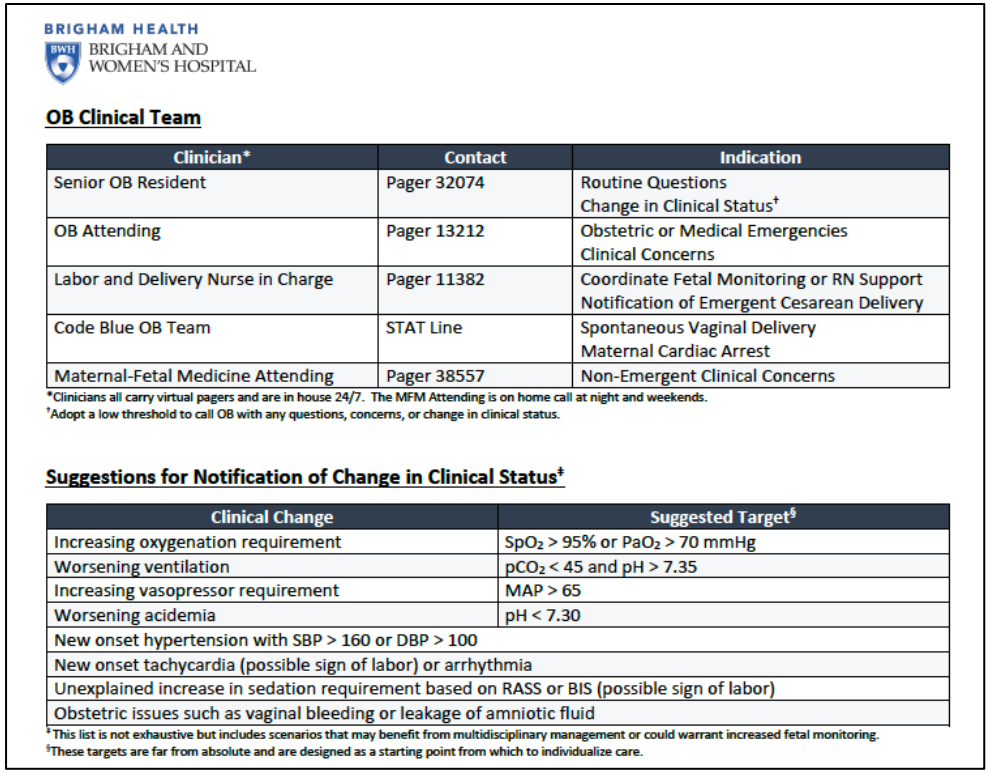


Build a System to Optimize Team Performance

Team-Based Pathways for Emergent Cesarean from the ICU



Communication Tip Sheet for the Critically-Ill Obstetric Patient



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OB Clinical Team

Clinician*	Contact	Indication
Senior OB Resident	Pager 32074	Routine Questions Change in Clinical Status†
OB Attending	Pager 13212	Obstetric or Medical Emergencies Clinical Concerns
Labor and Delivery Nurse in Charge	Pager 11382	Coordinate Fetal Monitoring or RN Support Notification of Emergent Cesarean Delivery
Code Blue OB Team	STAT Line	Spontaneous Vaginal Delivery Maternal Cardiac Arrest
Maternal-Fetal Medicine Attending	Pager 38557	Non-Emergent Clinical Concerns

*Clinicians all carry virtual pagers and are in house 24/7. The MFM Attending is on home call at night and weekends.
†Adopt a low threshold to call OB with any questions, concerns, or change in clinical status.

Suggestions for Notification of Change in Clinical Status‡

Clinical Change	Suggested Target§
Increasing oxygenation requirement	$SpO_2 > 95\%$ or $PaO_2 > 70$ mmHg
Worsening ventilation	$pCO_2 < 45$ and $pH > 7.35$
Increasing vasopressor requirement	MAP > 65
Worsening acidemia	pH < 7.30
New onset hypertension with SBP > 160 or DBP > 100	
New onset tachycardia (possible sign of labor) or arrhythmia	
Unexplained increase in sedation requirement based on RASS or BIS (possible sign of labor)	
Obstetric issues such as vaginal bleeding or leakage of amniotic fluid	

‡This list is not exhaustive but includes scenarios that may benefit from multidisciplinary management or could warrant increased fetal monitoring.
§These targets are far from absolute and are designed as a starting point from which to individualize care.

Critical Care OB Nursing Huddle

Question	Example Responses
What is our understanding of the patient and disease?	
What are our completed and planned interventions?	
What is the monitoring plan?	
Is there adequate access?	
When is the next timepoint for assessment, how will it be done, and who will do it?	
What clinical parameters warrant earlier reassessment or escalation of care?	
Who is aware of the patient's condition?	
Are there additional resources or personnel needed?	
Timeframe for reassessment and outstanding concerns.	

Critical Care OB Nursing Huddle

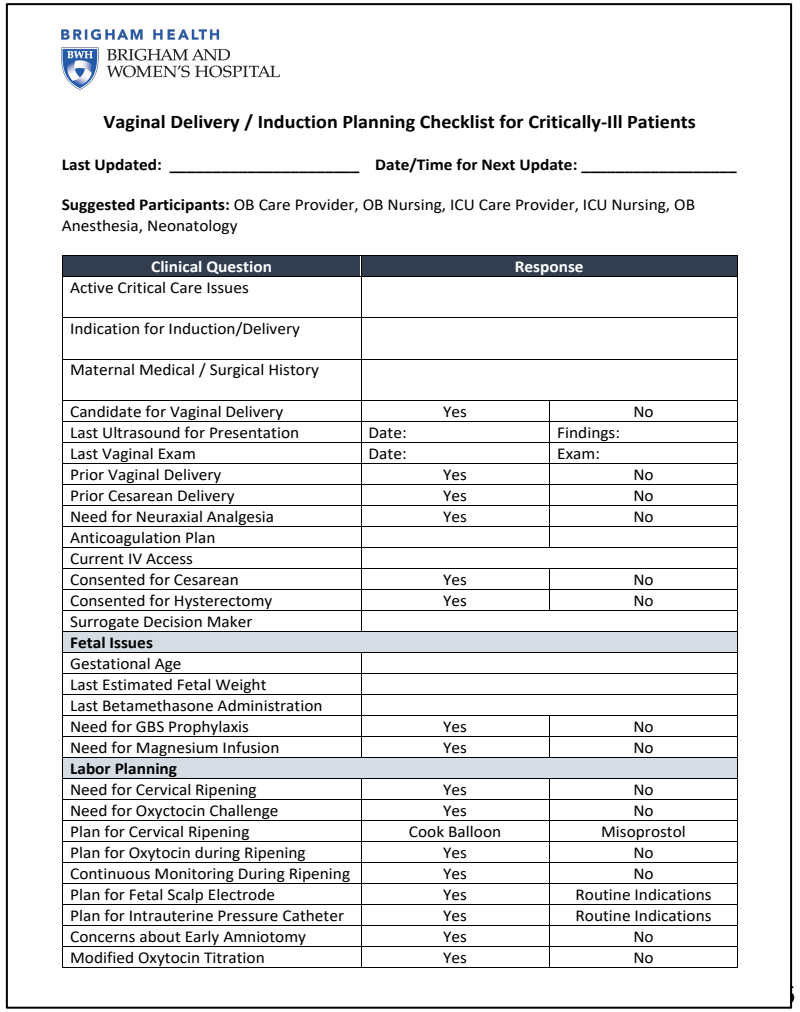
Question	Example Responses
What is our understanding of the patient and disease?	32 yo G1P0 at 26 weeks urosepsis and shock.
What are our completed and planned interventions?	Labs, cultures, IV antibiotics, fluid resuscitation
What is the monitoring plan?	Telemetry, continuous EFM, NIBP, Foley
Is there adequate access?	18G and 20G PIV
When is the next timepoint for assessment, how will it be done, and who will do it?	4 hours with repeat labs including lactate reviewed at bedside with primary OB and nurse
What clinical parameters warrant earlier reassessment or escalation of care?	Hypoxemia, oliguria, failure to maintain MAP, rising lactate, category 2 fetal heart rate tracing
Who is aware of the patient's condition?	Anesthesia, NICU, ICU, MFM
Are there additional resources or personnel needed?	Interventional radiology for perinephric abscess
Timeframe for reassessment and outstanding concerns.	Reassess in 4 hours, needs to sign healthcare proxy

Facilitating a Multidisciplinary Shared Mental Model

OB Critical Care Nursing Checklist

Question
What is our understanding of the patient and disease?
What are our completed and planned interventions and anticipated response
What is the monitoring plan?
Is there adequate access?
When is the next timepoint for assessment, how will it be done, and who will do it?
Who is aware of the patient's condition?
What other resources are needed?
What is the timeframe for reassessment and what warrants sooner evaluation?
Who will update the patient and/or healthcare agent about plan of care?

ICU Induction Checklist



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Vaginal Delivery / Induction Planning Checklist for Critically-Ill Patients

Last Updated: _____ **Date/Time for Next Update:** _____

Suggested Participants: OB Care Provider, OB Nursing, ICU Care Provider, ICU Nursing, OB Anesthesia, Neonatology

Clinical Question	Response	
Active Critical Care Issues		
Indication for Induction/Delivery		
Maternal Medical / Surgical History		
Candidate for Vaginal Delivery	Yes	No
Last Ultrasound for Presentation	Date:	Findings:
Last Vaginal Exam	Date:	Exam:
Prior Vaginal Delivery	Yes	No
Prior Cesarean Delivery	Yes	No
Need for Neuraxial Analgesia	Yes	No
Anticoagulation Plan		
Current IV Access		
Consented for Cesarean	Yes	No
Consented for Hysterectomy	Yes	No
Surrogate Decision Maker		
Fetal Issues		
Gestational Age		
Last Estimated Fetal Weight		
Last Betamethasone Administration		
Need for GBS Prophylaxis	Yes	No
Need for Magnesium Infusion	Yes	No
Labor Planning		
Need for Cervical Ripening	Yes	No
Need for Oxyctocin Challenge	Yes	No
Plan for Cervical Ripening	Cook Balloon	Misoprostol
Plan for Oxytocin during Ripening	Yes	No
Continuous Monitoring During Ripening	Yes	No
Plan for Fetal Scalp Electrode	Yes	Routine Indications
Plan for Intrauterine Pressure Catheter	Yes	Routine Indications
Concerns about Early Amniotomy	Yes	No
Modified Oxytocin Titration	Yes	No

Facilitating a Multidisciplinary Shared Mental Model

OB Critical Care Nursing Checklist

Question
What is our understanding of t… patient and disease?
What are our com… interventions and anticipat…
What…
Wh… will it be …
Who is …
What other…
What is the tin… warrants sooner
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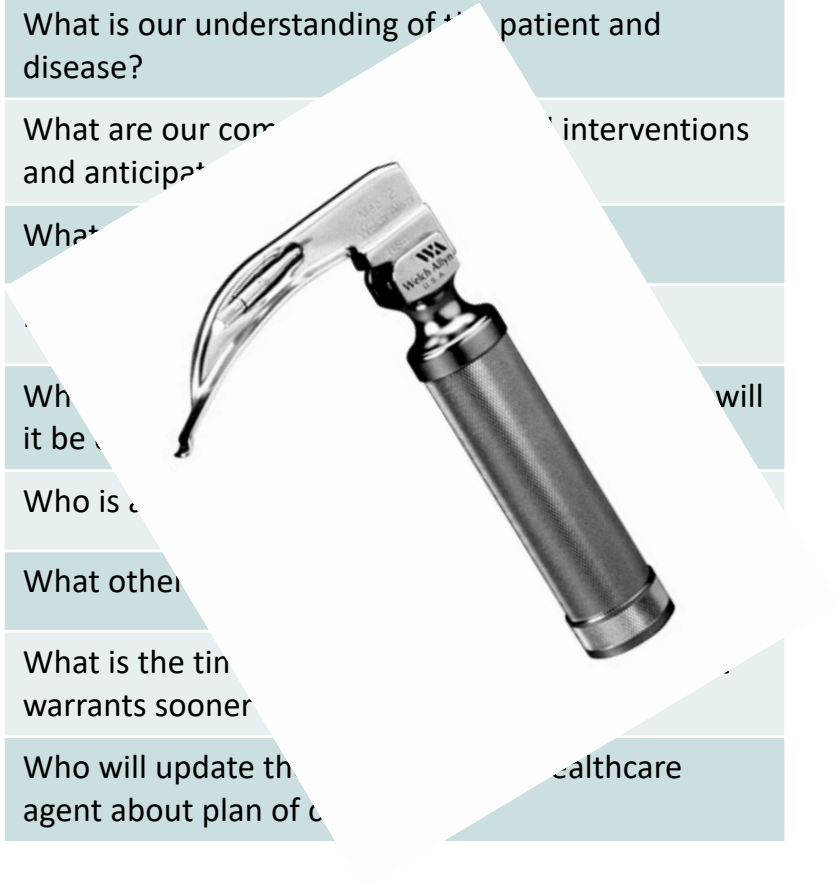


ICU Induction Checklist

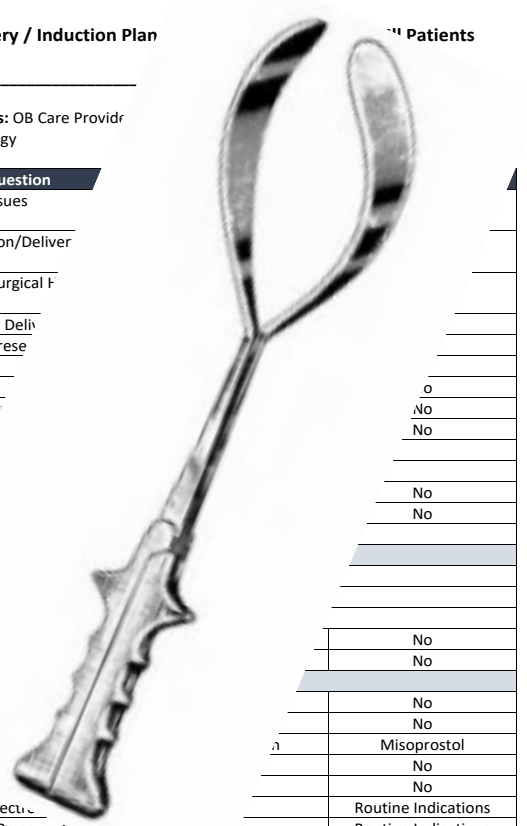
BRIGHAM HEALTH
BRIGHAM AND WOMEN'S HOSPITAL

Vaginal Delivery / Induction Plan … **Patients**

Last Updated: _____

Suggested Participants: OB Care Provid… Anesthesia, Neonatology

Clinical Question		
Active Critical Care Issues		
Indication for Induction/Deliver…		
Maternal Medical / Surgical H…		
Candidate for Vaginal Deli…		
Last Ultrasound for Prese…		
Last Vaginal Exam		
Prior Vaginal Delivery		o
Prior Cesarean Delive…		No
Need for Neuraxial A…		No
Anticoagulation Pla…		
Current IV Access		
Consented for C…		No
Consented for I…		No
Surrogate Dec…		
Fetal Issues		
Gestational …		
Last Estim…		
Last Beta…		
Need fo…		No
Need f…		No
Labo…		
Nee…		No
Ne…		No
Plan…	…n	Misoprostol
Plan for Ox…		No
Continuous Monit…		No
Plan for Fetal Scalp Electr…		Routine Indications
Plan for Intrauterine Pressure Ca…	…s	Routine Indications
Concerns about Early Amniotomy	es	No
Modified Oxytocin Titration	Yes	No



Obstetric Critical Care

- Relies on an understanding of pregnancy physiology to apply or modify available therapies to address critical illness in this unique state.
- Utilizes clinical experience balancing competing priorities to optimize goal-directed care for patient and fetus.
- Integrates opinions of members of the multidisciplinary team to develop a shared mental model for collaborative care.
- Prioritizes the education and development of the team and develops systems to ensure equitable delivery of high-quality care.

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