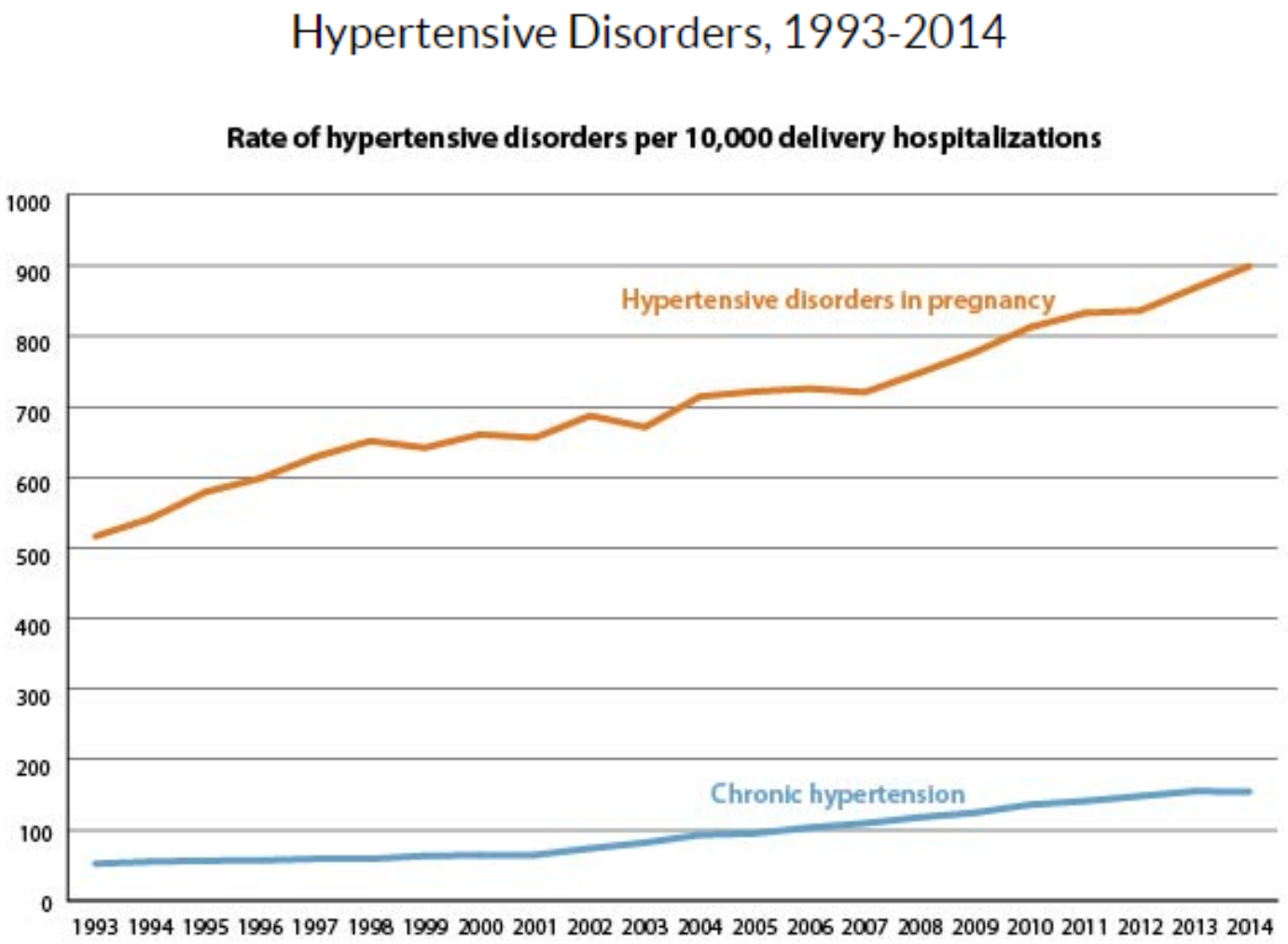
REVIEW OF PREECLAMPSIA SAFETY BUNDLE

Juliet Mushi, MD FACOG
Kerry Terminello, RN MS

Objectives

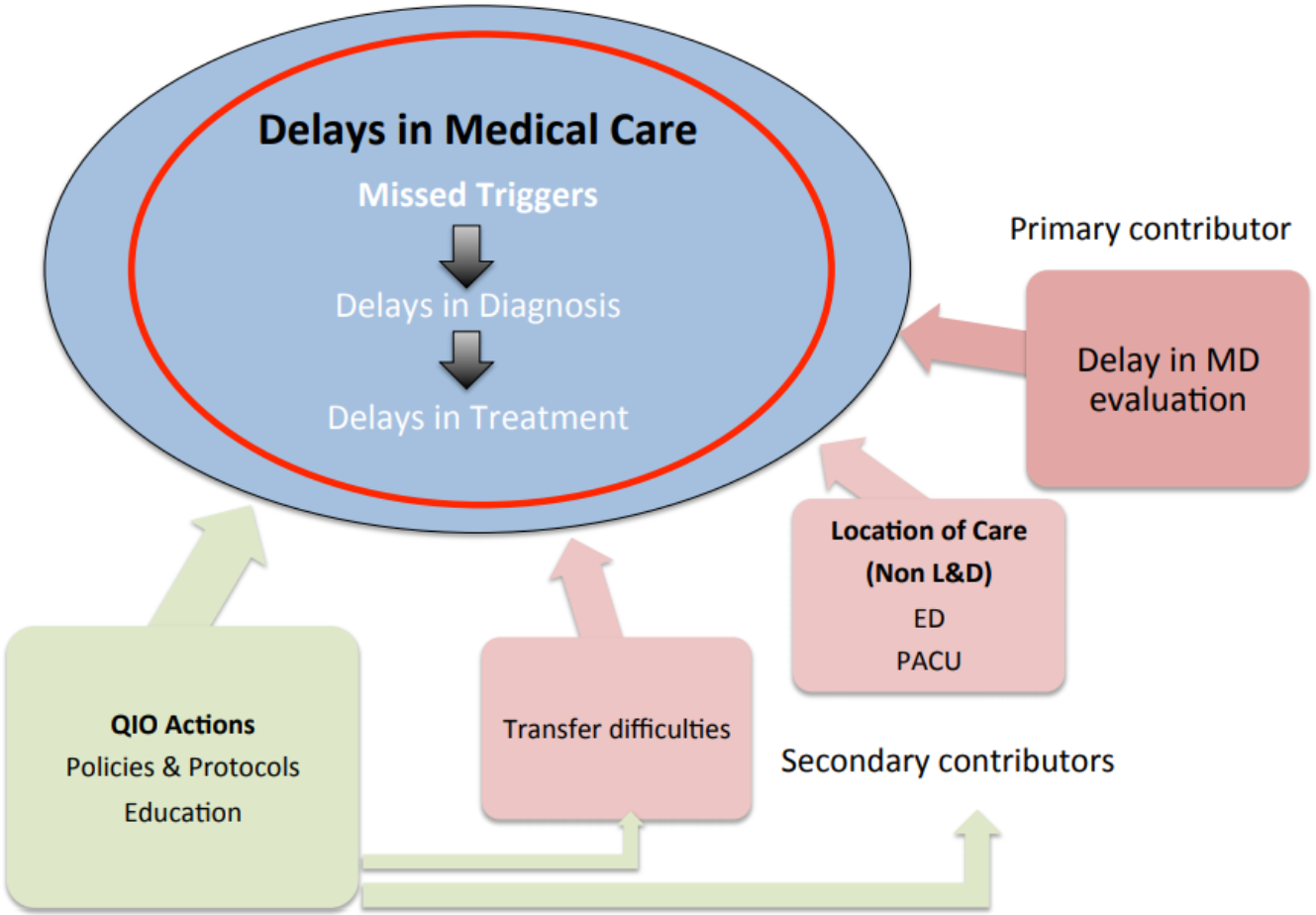
- Know diagnostic criteria for spectrum of hypertensive disorders of pregnancy including hypertensive emergency
- Review appropriate triage and initial evaluation of patients who present with a hypertensive disorder in pregnancy
- Describe appropriate monitoring of patients and appropriate pharmacologic agents to use for treatment of hypertensive disorders of pregnancy
- Identify preeclamptic complications and establish escalation process

Why Should We Care?



CDC Nationwide Inpatient Sample, 2015

The 3-Delay (3D) Model



UNFPA, 2008

Types of Hypertensive Disorders

- Chronic hypertension
- Gestational hypertension
- Preeclampsia-eclampsia
- Chronic hypertension with superimposed preeclampsia
- Preeclampsia with severe features

Chronic vs Gestational Hypertension

CHRONIC HYPERTENSION

- Systolic BP ≥ 140mm Hg

OR

Diastolic BP ≥ 90mm Hg

- Present *before* pregnancy or less than 20 weeks GA
- *Persists* >12 weeks postpartum

GESTATIONAL HYPERTENSION

- Systolic BP ≥ 140mm Hg

OR

Diastolic BP ≥ 90mm Hg

- Develops *after* 20 weeks GA
- Hypertension with *no proteinuria or other symptoms*

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Preeclampsia

- Systolic BP ≥ 140mm Hg

OR

Diastolic BP ≥ 90mm Hg

2 occasions at least 4 hours apart, >20 weeks GA

AND

Proteinuria

- Mild - 3-5 gm in 24h urine
- Severe - > 5 gm in 24h urine
- ≥ 1+ on dipstick
- ≥ 0.3mg/dL on P/C ratio

OR

Symptoms

- Platelets < 100k
- Renal insufficiency
- LFTs >2x normal
- Pulmonary edema
- Cerebral or visual symptoms

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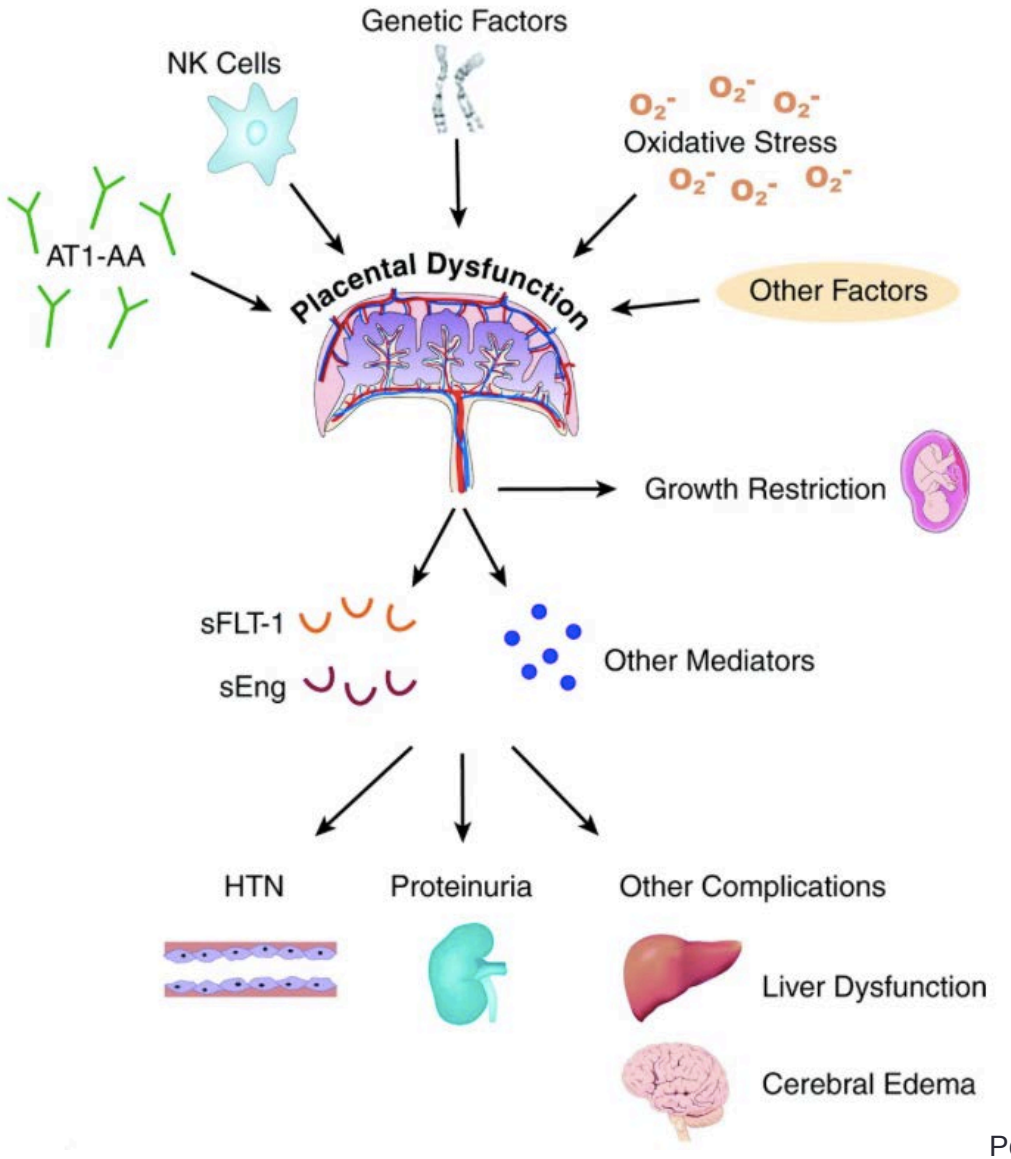
Abnormal Placental Function



Powe et al, 2011, Circulation

Risk Factors for Preeclampsia

- HIGH RISK
  - Previous pregnancy with preeclampsia (early onset or IUFD)
  - Multifetal gestation
  - Chronic hypertension
  - Type 1 or 2 diabetes mellitus
  - Renal disease
  - Autoimmune disease (antiphospholipid syndrome, systemic lupus erythematosus)
- MODERATE RISK
  - Obesity
  - Nulliparity
  - Maternal age $\geq$ 35 years
  - Sociodemographic factors (African descent, low SES)

USPSTF, 2014

Preeclampsia - complications

Superimposed preeclampsia

- Existing diagnosis of chronic hypertension
- Sudden increase in proteinuria
- Sudden increase in BP
- Development of headache, scotomata, epigastric pain
- HELLP syndrome

Severe preeclampsia

- ≥ 1 of the following:
  - SBP ≥ 160 OR DBP ≥ 100
  - Oliguria <500ml/24hours
  - Renal insufficiency
  - Unremitting headache/visual disturbances
  - Pulmonary edema
  - Epigastric/RUQ pain
  - LFTs > 2x normal
  - Platelets < 100K
  - HELLP syndrome

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Eclampsia

- New onset grand mal seizures in a woman with preeclampsia
- A SEIZING PATIENT IS NOT STABLE FOR TRANSPORT

- Other severe complications of preeclampsia
  - Cerebral edema, cerebral hemorrhage, stroke (thrombosis)
  - Pulmonary edema
  - Renal failure, oliguria or anuria, glomerulopathy
  - Liver rupture or failure

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Triaging Patients with Pre-eclampsia

- ***Early Recognition is KEY!!***

- Initial Assessment:
  - Document previous history of pre-eclampsia, eclampsia, chronic hypertension
  - Neurological irritability
    - Headache
    - Visual disturbances
    - Altered LOC - confusion
  - Hepatic involvement
    - Epigastric or RUQ pain
    - Nausea
    - Vomiting
    - Heartburn

Blood Pressure Measurement

Figure 1: Recommended cuff sizes

Arm Circumference (cm)	Cuff Size
22-26	“Small Adult”: 12x22cm
27-34	“Adult”: 16x30cm
35-44	“Large Adult”: 16x36cm
45-52	“Adult Thigh”: 16x42cm

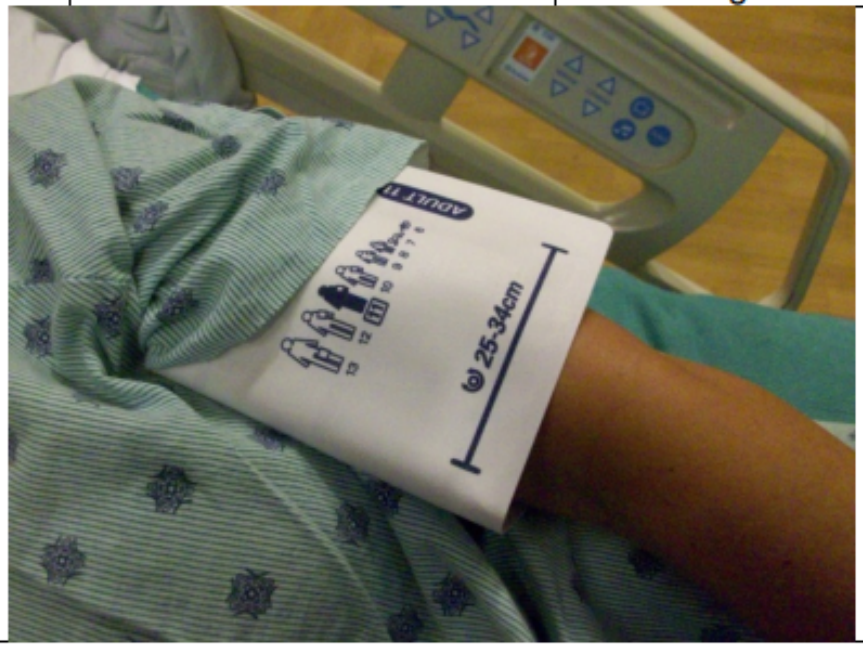


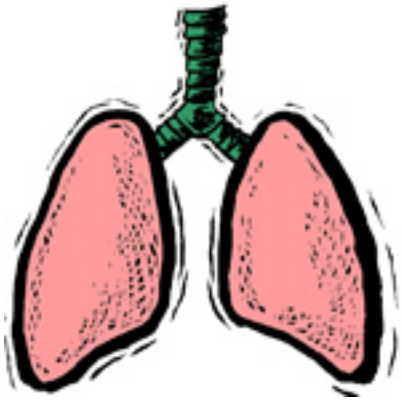
Photo courtesy of and printed with permission by Kristi Gabel, RNC-OB, C-EFM, MSN, CNS, Sutter Roseville Medical Center 2013.

Vital Signs to Monitor and Document:

- BP every 15 minutes during administration of the MgSO4 loading dose
- BP, HR, RR every 30 minutes while on continuous MgSO4 infusion during the intrapartum period
- BP, HR, and RR every 5-15 minutes during hypertensive episodes and after IV antihypertensive medication administration.
- Assess edema once per shift (facial, pedal, hand)
- Temperature every 4 hours if membranes intact or post delivery; every 2 hours is membranes ruptured.

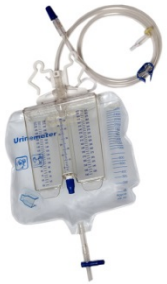
Respiratory Assessment

- Auscultate breathe sounds every 2 hours
- Continuous pulse oximetry
- Monitory for signs of pulmonary edema
  - SOB
  - Tachcardia
  - Tachypnea
  - Abnormal breath sounds



Intake and Output

- Measure and record hourly intake and output.
- Insert foley catheter with urometer.



- Notify MD if urinary output is <30cc/hour
  - Concern for magnesium toxicity as magnesium sulfate is renally cleared
- Patients may have clear liquid diet per MD order.

Labs to Draw in Triage

- CBC
  - Platelets less than 100, 000/microliter
- BASIC METABOLIC PROFILE
  - Creatinine greater than 1.1mg/dL or doubling
- HEPATIC FUNCTION PANEL
  - Elevated AST and ALT twice normal concentration
- Urine protein assessment
  - protein/creatinine ratio ≥ 0.3
  - dipstick reading of 1+

H
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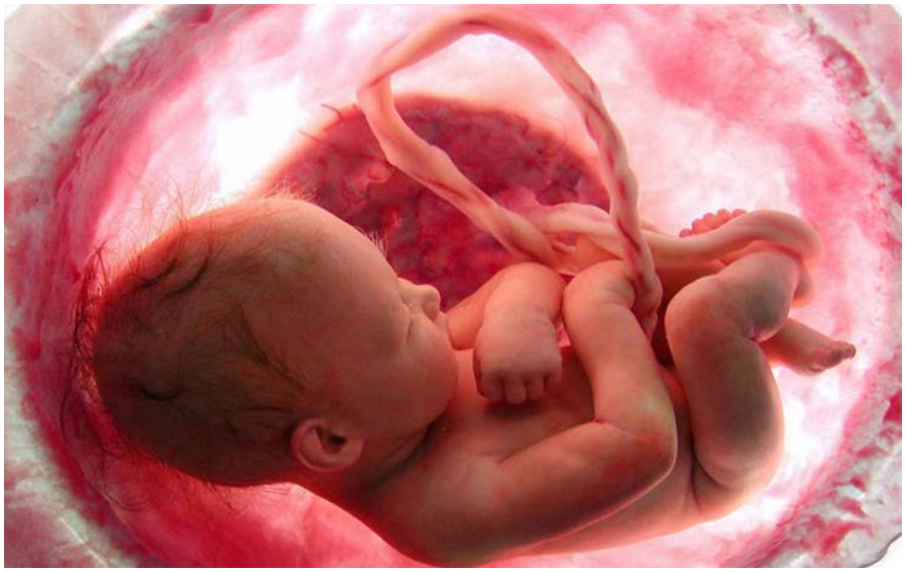
Let's NOT Forget the BABY!

- Continuous fetal monitoring
- Patient at high risk for placental abruption
- Document FHR and the presence or absence of contractions every 15 minutes



Anti-hypertensive medications

LABETALOL 100mg/20ml vial	**Initial: Draw 4ml from vial** **20mg (4ml)** IV bolus followed by **40mg (8ml)** if not effective within 10 minutes; then **80mg (16ml)** every 10 minutes max total dose 300mg/60ml
HYDRALAZINE 20mg/ml vial	Initial: Draw **0.25ml** from vial **5-10 mg (0.25-0.5 ml)** IV every 15-20 minutes
LABETALOL 200mg tablets	**200mg PO** and repeat in 30 minutes if needed
NIFEDIPINE 10mg tablets	**10mg PO** and repeat in 30 minutes if needed

Magnesium Sulfate Administration

- Indications:
  - Seizure prophylaxis in women with severe preeclampsia
  - Initial therapy for an eclamptic seizure
  - NOT for blood pressure control

- Prepared solution of 40gms magnesium sulfate in 1000ml normal saline or the equivalent (yields 1gm per 25ml)

- Magnesium sulfate is piggybacked into the main IV and the solution is *always* controlled via an infusion pump using the guardrail feature

Magnesium Sulfate Dosing

- Loading dose: 6gm bolus (150cc of MgSO4) over 15-30 minutes(May give 4gm bolus per MD orders or poor renal function)
- Maintenance dose: 1 – 2gm per hour (25 – 50cc per hour) via infusion pump and MD orders
- Independent verification of drug and dosage by 2 RNs prior to administration

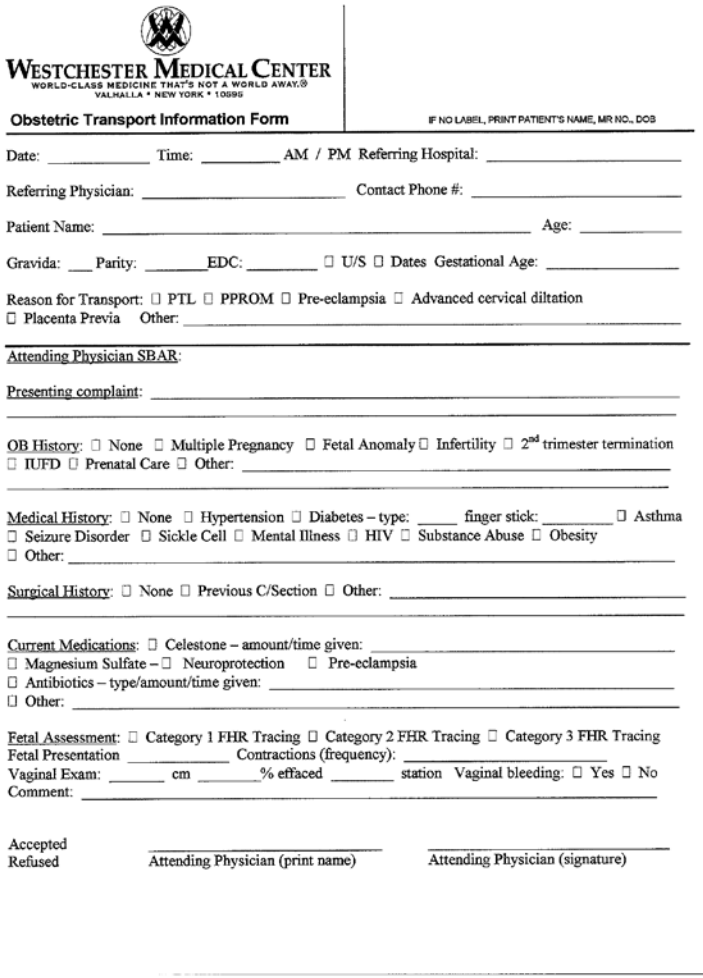
Magnesium Sulfate Toxicity

- Assess reflexes and the presence or absence of clonus
- Asses LOC, headache, and visual disturbances
- Signs of MgSO4 toxicity
  - Absent deep tendon reflexes
  - Respiratory depression
  - Cardiac Arrest
    - Antidote = calcium gluconate

Sample Case

- Before transfer, a nurse accidentally replaced a mother's depleted LR solution with an unlabeled liter of magnesium sulfate prepared by another nurse for a different patient
- The mother had preeclampsia, so she had an existing magnesium sulfate solution infusing when the second solution was hung.
- Patient was transferred to busy, understaffed postpartum unit
  - OUTCOME – respiratory arrest and developed anoxic encephalopathy

From Triage to Transfer



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Obstetric Transport Information Form IF NO LABEL, PRINT PATIENT'S NAME, MR NO., DOB

Date: _____ Time: _____ AM / PM Referring Hospital: _____

Referring Physician: _____ Contact Phone #: _____

Patient Name: _____ Age: _____

Gravida: ___ Parity: _____EDC: _____ ☐ U/S ☐ Dates Gestational Age: _____

Reason for Transport: ☐ PTL ☐ PPROM ☐ Pre-eclampsia ☐ Advanced cervical diltation
☐ Placenta Previa Other: _____

Attending Physician SBAR:

Presenting complaint: _____

OB History: ☐ None ☐ Multiple Pregnancy ☐ Fetal Anomaly ☐ Infertility ☐ 2nd trimester termination
☐ IUFD ☐ Prenatal Care ☐ Other: _____

Medical History: ☐ None ☐ Hypertension ☐ Diabetes – type: _____ finger stick: _____ ☐ Asthma
☐ Seizure Disorder ☐ Sickle Cell ☐ Mental Illness ☐ HIV ☐ Substance Abuse ☐ Obesity
☐ Other: _____

Surgical History: ☐ None ☐ Previous C/Section ☐ Other: _____

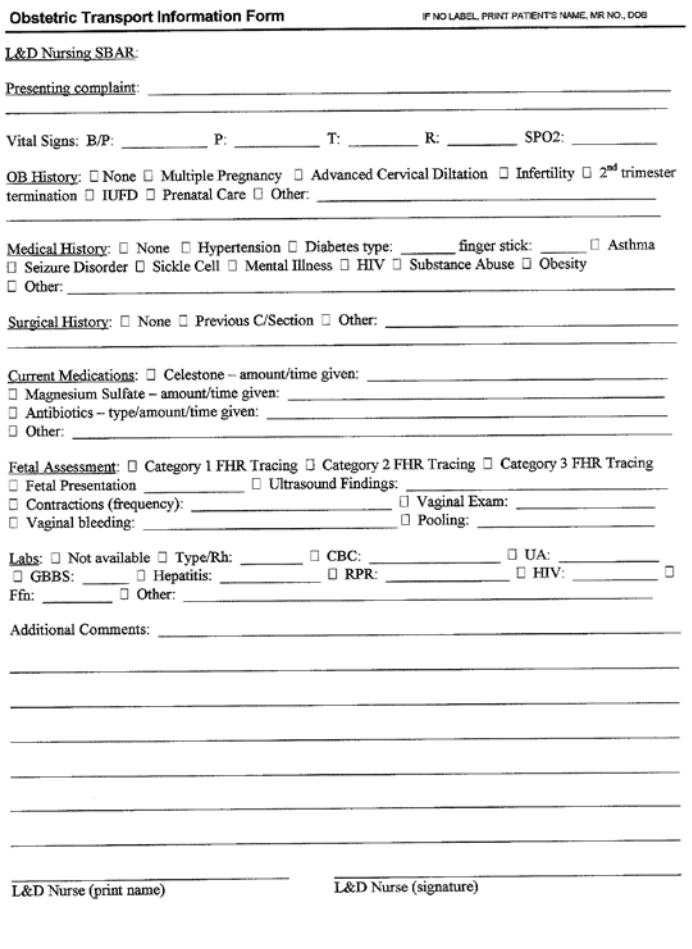
Current Medications: ☐ Celestone – amount/time given: _____
☐ Magnesium Sulfate – ☐ Neuroprotection ☐ Pre-eclampsia
☐ Antibiotics – type/amount/time given: _____
☐ Other: _____

Fetal Assessment: ☐ Category 1 FHR Tracing ☐ Category 2 FHR Tracing ☐ Category 3 FHR Tracing
Fetal Presentation _____ Contractions (frequency): _____
Vaginal Exam: _____ cm _____% effaced _____ station Vaginal bleeding: ☐ Yes ☐ No
Comment: _____

Accepted
Refused

_____ Attending Physician (print name)

_____ Attending Physician (signature)



Obstetric Transport Information Form IF NO LABEL, PRINT PATIENT'S NAME, MR NO., DOB

L&D Nursing SBAR:

Presenting complaint: _____

Vital Signs: B/P: _____ P: _____ T: _____ R: _____ SPO2: _____

OB History: ☐ None ☐ Multiple Pregnancy ☐ Advanced Cervical Diltation ☐ Infertility ☐ 2nd trimester termination ☐ IUFD ☐ Prenatal Care ☐ Other: _____

Medical History: ☐ None ☐ Hypertension ☐ Diabetes type: _____ finger stick: _____ ☐ Asthma
☐ Seizure Disorder ☐ Sickle Cell ☐ Mental Illness ☐ HIV ☐ Substance Abuse ☐ Obesity
☐ Other: _____

Surgical History: ☐ None ☐ Previous C/Section ☐ Other: _____

Current Medications: ☐ Celestone – amount/time given: _____
☐ Magnesium Sulfate – amount/time given: _____
☐ Antibiotics – type/amount/time given: _____
☐ Other: _____

Fetal Assessment: ☐ Category 1 FHR Tracing ☐ Category 2 FHR Tracing ☐ Category 3 FHR Tracing
☐ Fetal Presentation _____ ☐ Ultrasound Findings: _____
☐ Contractions (frequency): _____ ☐ Vaginal Exam: _____
☐ Vaginal bleeding: _____ ☐ Pooling: _____

Labs: ☐ Not available ☐ Type/Rh: _____ ☐ CBC: _____ ☐ UA: _____
☐ GBBS: _____ ☐ Hepatitis: _____ ☐ RPR: _____ ☐ HIV: _____ ☐
Ffn: _____ ☐ Other: _____

Additional Comments: _____

_____ L&D Nurse (print name)

_____ L&D Nurse (signature)

Conclusion

- Heightened awareness of hypertensive disorders of pregnancy
- Timely intervention and assessment of the patient and her fetus
- Appropriate dosage and timing of antihypertensive medications
- Appropriate dosage and administration of magnesium sulfate for seizure prophylaxis
- Clear and accurate communication for transport of patient and her fetus

QUESTIONS

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