

Preeclampsia & Eclampsia



Hypertensive Disorders of Pregnancy

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Hypertensive Disorders of Pregnancy: 4 Classifications

1. Chronic Hypertension

3. Gestational
Hypertension

2. Chronic Hypertension +
Preeclampsia

4. Preeclampsia

Severe Preeclampsia

- Eclampsia
- HELLP syndrome

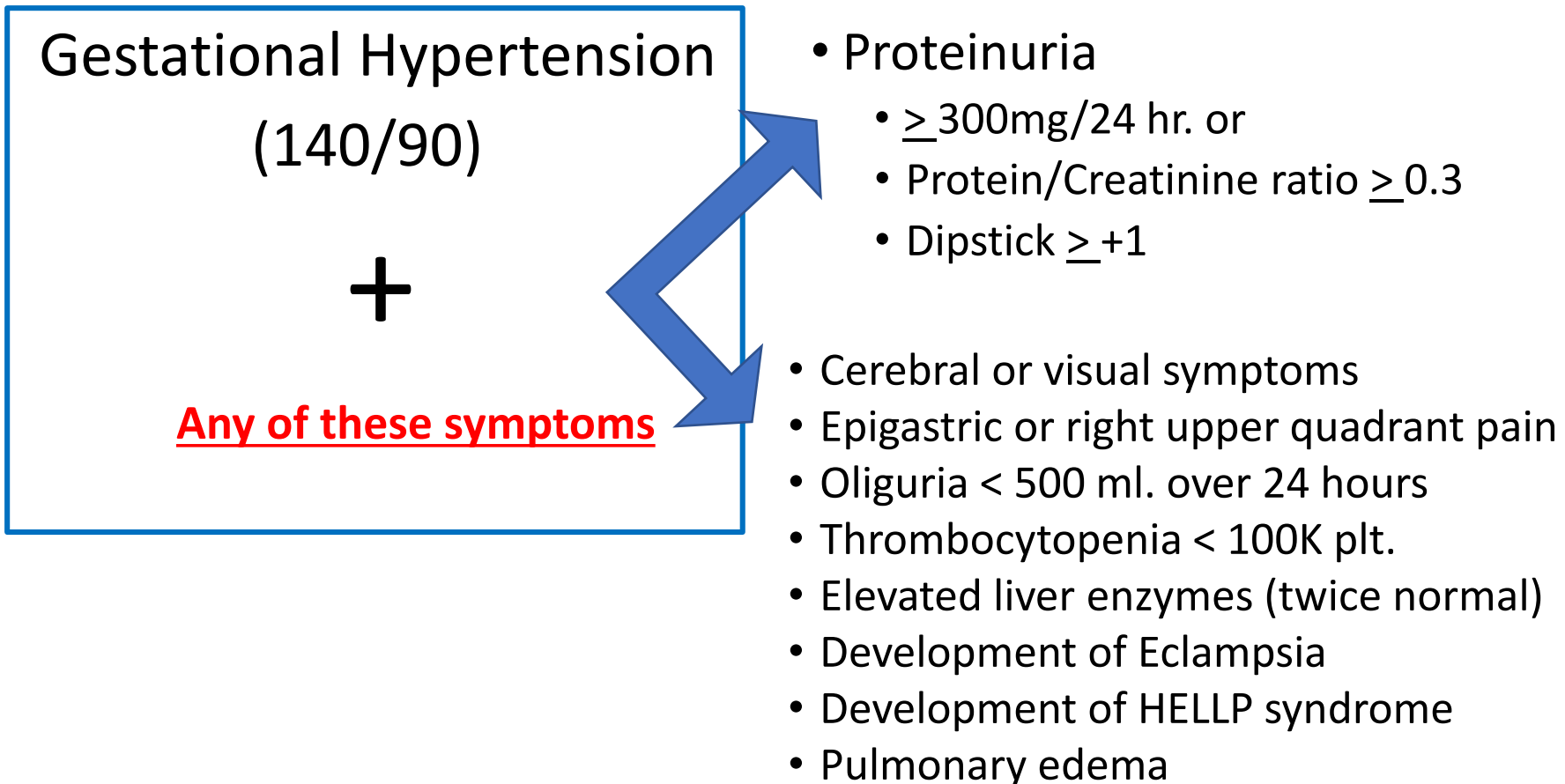
Definitions: 140/90 = Hypertension

160/110 = Severe Hypertension

- Chronic (preexisting) Hypertension
 - Onset prior to 20th week gestation
 - May continue through 12 wks PP
 - BP \geq 140 systolic or \geq 90 diastolic
 - BP \geq 160 systolic or \geq 110 diastolic = Severe
- Gestational Hypertension
 - Occurring after 20 weeks gestation in a previously normotensive woman
 - Resolves by 12 wks PP
 - BP \geq 140 systolic or \geq 90 diastolic
 - BP \geq 160 systolic or \geq 110 diastolic = Severe

Preeclampsia

*Syndrome defined by hypertension & proteinuria
(proteinuria is not a requirement for diagnosis)*



Severe Preeclampsia

- Systolic BP ≥ 160 , or diastolic BP ≥ 110

*Elevated SBP is better indicator of stroke than DBP

- (95.8%) women with systolic BP > 160mm Hg → stroke
- (12.5%) women with diastolic BP > 110mm Hg → stroke

- Cerebral or visual symptoms
- Epigastric or right upper quadrant pain
- Oliguria < 500 ml. over 24 hours
- Thrombocytopenia
- Elevated liver enzymes (twice normal)
- Development of Eclampsia
- Development of HELLP syndrome
- Pulmonary edema

Risk Factors

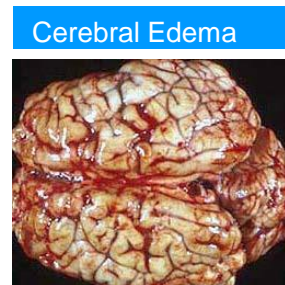
- ❖ Personal history: Hypertension, Pregestational Diabetes, Preeclampsia, Renal Disease, Lupus (other autoimmune diseases)
- ❖ Multifetal pregnancy
 - Maternal age > 40 years
 - Nulliparous – first pregnancy
 - Obesity BMI>30
 - Mother or sister with preeclampsia

Maternal Complications

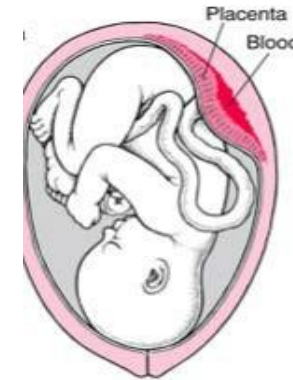
- Stroke from cerebral hemorrhage
- Placental abruption
- Eclamptic seizures
- Cerebral Edema
- Liver hematoma/rupture
- Pulmonary edema
- Acute renal failure
- Hemorrhage/DIC
- Cardiomyopathy



Eclamptic Seizure



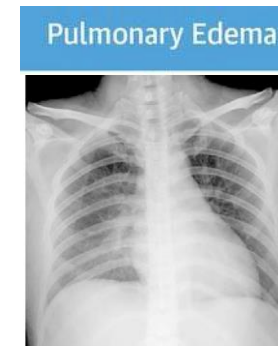
Cerebral Edema



Placental Abruption



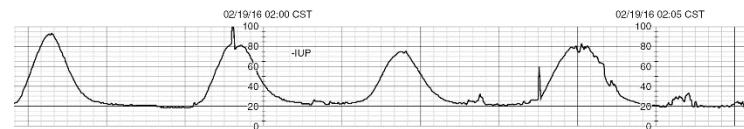
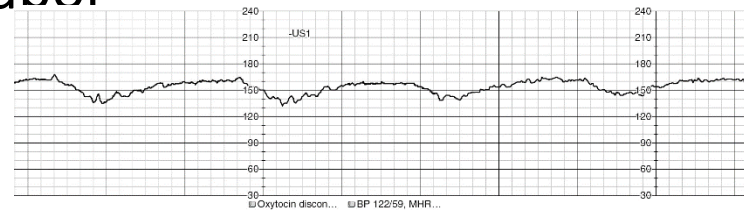
Hemorrhage



Pulmonary Edema

Fetal Complications

- IUGR
- Premature birth
- Fetal intolerance to labor
- Hypoxia
- Death



Pathophysiology

Failure of normal physiologic adaptations to pregnancy

Normal Pregnancy

- ↑ plasma volume
- ↓ vascular resistance
- ↑ renal blood flow

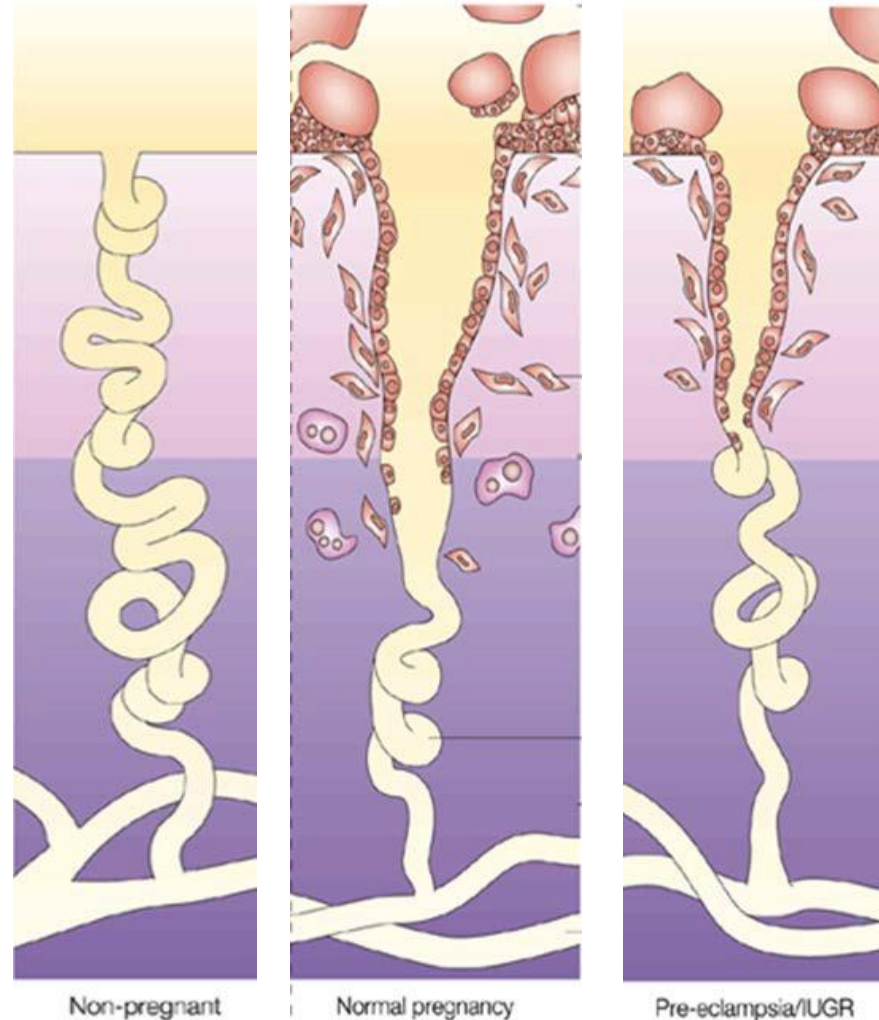
Preeclampsia

- ↓ plasma volume
- ↑ vascular resistance
- ↓ renal blood flow

Probably multiple etiologies cause the syndrome

Pathophysiology

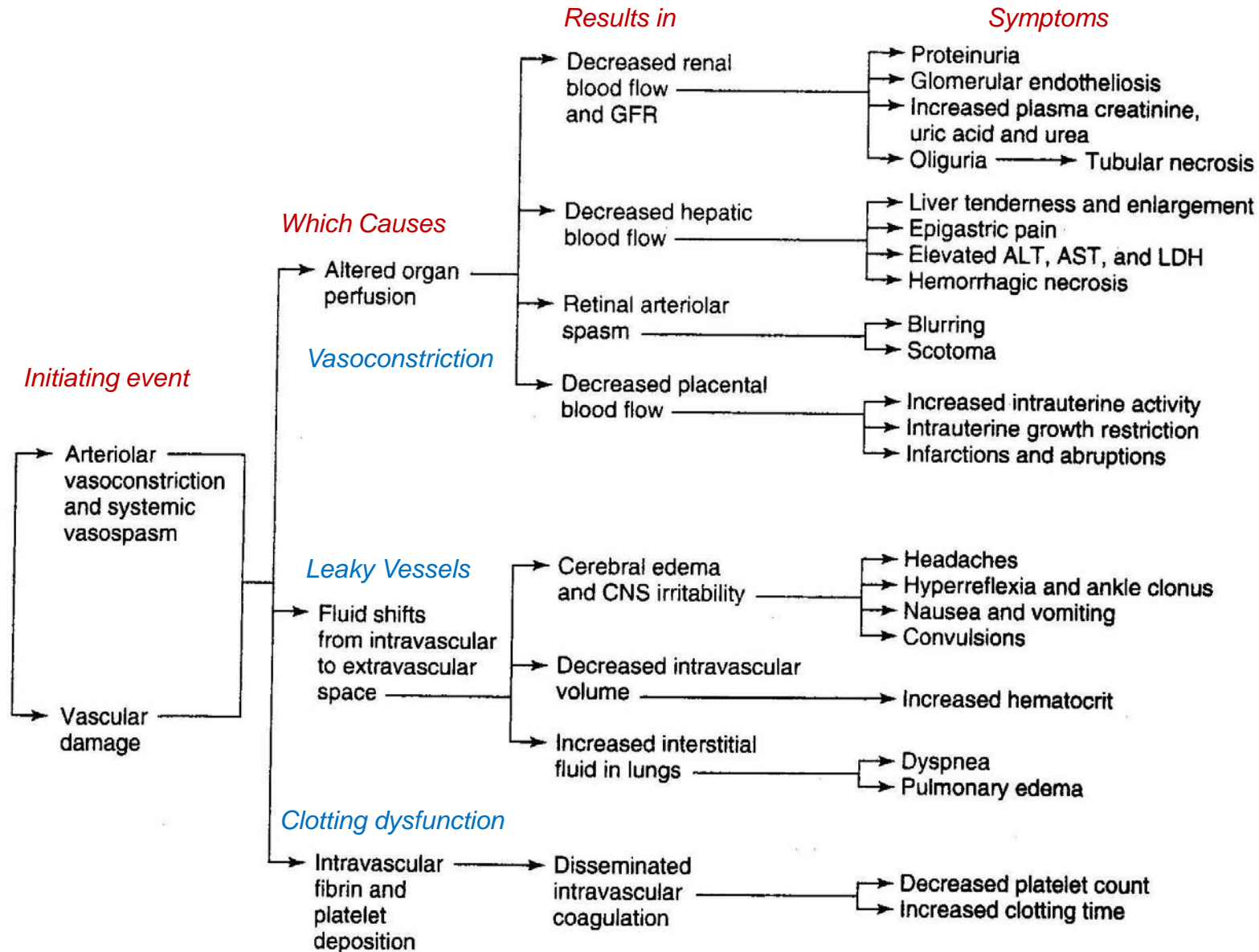
- Stage 1: Poor placentation
 - Incomplete invasion of spiral arterioles results in
↓ uteroplacental blood flow
- Stage 2: Inflammation
 - The ischemic placenta induces widespread endothelial cell damage and maternal systemic inflammatory response



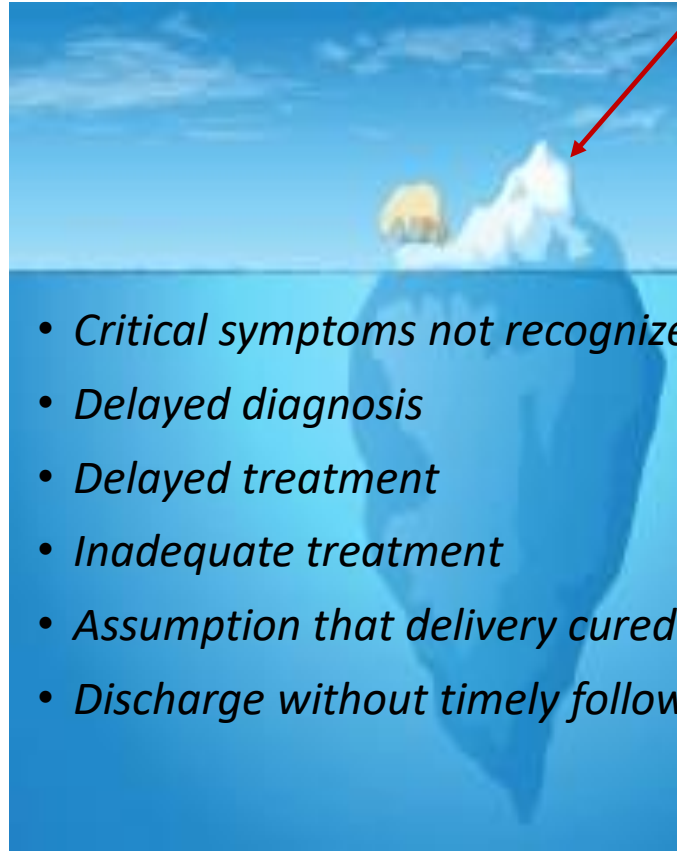
Spiral arteries
Normal pregnancy
Dilates →
increased bloodflow

Spiral arteries
Preeclampsia:
Fibrous → narrow
Less bloodflow

Alteration in Systems



Poor Management Outcomes



- *Critical symptoms not recognized*
- *Delayed diagnosis*
- *Delayed treatment*
- *Inadequate treatment*
- *Assumption that delivery cured preeclampsia*
- *Discharge without timely follow-up*

Maternal Death

16:100,000



Near Misses: ICU

50-100X death
rate



(Serious Complications)

(25,000/yr)



Most Common Preventable Errors

See It!

Preeclampsia related

- Failure to adequately control blood pressure in hypertensive women

Believe It!

- Failure to adequately diagnose and treat pulmonary edema in women with preeclampsia

Treat It!

- Failure to pay attention to vital signs following birth
- Hemorrhage following cesarean birth

5 Management Objectives

1. Recognize the situation (signs & symptoms)

- ① 2 elevated BP within 15 min. → notify physician
- ② Initiate anti-hypertensive treatment ASAP

2. Control BP with antihypertensive agents

↓ Arterial spasm to prevent vascular injury to brain, kidneys, and heart

Diastolic not below 90: placenta needs adequate perfusion

3. Prevent or control seizure activity

Magnesium Sulfate infusion

4. Delivery of fetus

Consider GA and delivery route

5. Postpartum surveillance

3-10 day follow-up in provider office

Delivery Timing Considerations

- 37 weeks – deliver
- 34 weeks – deliver after maternal stabilization
AND
 - Antenatal steroids –Betamethasone
 - Deliver in 48 hours
- Deliver as soon as maternal stabilization with following complications:
 - Fetal reasons: concerning FHR pattern, poor Doppler studies...
 - Abruption
 - Pulmonary edema
 - Eclampsia –stabilized
 - DIC
 - Persistent/worsening symptoms

Initial Management Begins With	Initial Dose	Next Dose ^a	Next Dose ^a
IV Labetalol (Beta blocker) Side effects: low heart rate bronchoconstriction	<ul style="list-style-type: none"> • Labetalol 20 mg IV for more than 2 min • Check BP in 10 min 	<ul style="list-style-type: none"> • Labetalol 40 mg IV for more than 2 min • Check BP in 10 min 	<ul style="list-style-type: none"> • Labetalol 80 mg IV for more than 2 min • Check BP in 10 min
IV Hydralazine (Arteriolar) Side effects: tachycardia, hypotension, flushing, headache	<ul style="list-style-type: none"> • Hydralazine 5 mg or 10 mg IV for more than 2 min • Check BP in 20 min 	<ul style="list-style-type: none"> • Hydralazine 10 mg IV for more than 2 min • Check BP in 20 min 	<ul style="list-style-type: none"> • Labetalol 20 mg IV for more than 2 min • Check BP in 10 min
Oral Nifedipine (Ca Channel blocker) Side effects: low BP low HR+ dizziness	<ul style="list-style-type: none"> • Immediate release Nifedipine capsules (10 mg orally) • Check BP in 20 min 	<ul style="list-style-type: none"> • Immediate release Nifedipine capsules (20 mg orally) • Check BP in 20 min 	<ul style="list-style-type: none"> • Immediate release Nifedipine capsules (20 mg orally) • Check BP in 20 min

**Contraindicated
In asthma**

If poor results after 3 doses
move on to another
antihypertensive

Doctor should obtain consult

Management of Preeclampsia

- Magnesium Sulfate is drug of choice
 - Acts at neuromuscular junction to produce muscular relaxation
 - Small vessel vasodilation
- Loading dose of 4-6g over 15-30 min
- Followed by maintenance dose of 2 -3g per hr



Magnesium Sulfate is NOT an antihypertensive medication

Magnesium Sulfate Therapy

- Monitor output : renal excretion
- Monitor deep tendon reflexes (DTRs)
- Monitor respirations
- Monitor LOC
- Crosses placenta – be prepared for lethargic infant – may require resuscitation
- ↑ Possibility of PP hemorrhage
NO Methergine, Cytotec preferable

Magnesium Toxicity

- Therapeutic 4-8mg/dl
- Loss of DTR's 9-12mg/dl
- Respiratory arrest/
muscle paralysis 12-18mg/dl
- Cardiac arrest 25-30mg/dl

Renal excretion – *beware of DM and other*
↓ *renal function*

Magnesium Toxicity

Antidote

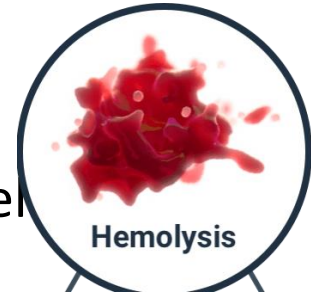
- Calcium Gluconate 10%
 - 1g/10 mL IV over 3 min.
- Airway & ventilatory support as needed
- O2 and suction set up and ready



HELLP Syndrome

- Hemolysis

- Abnormal peripheral blood smear- schistocytes & burr cells
- ↑ bilirubin



- Elevated Liver enzymes -2X upper limits of normal

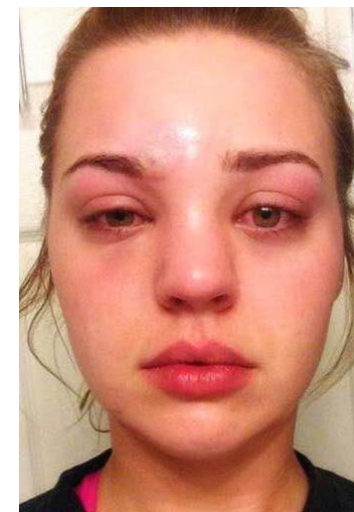
- LDH > 600 IU/L
- ALT > 70 IU/L

- Low Platelets

- Thrombocytopenia < 100,000/mm³
- Severe < 50,000/mm³

HELLP Syndrome

- Frequently does not present with classic preeclamptic symptoms of hypertension & proteinuria
 - Malaise 90%
 - R ↑ quad. Pain 65%
 - N/V 50%
 - Worsening edema
 - Abdominal, flank or shoulder pain
 - Hematuria
 - Hypoglycemia



Eclampsia

- New onset of convulsions and/or coma in a woman with signs of preeclampsia

50% antepartum

25% intrapartum

25% postpartum

- Mechanism: cerebral edema, ischemia, hemorrhage or vasospasm

Complications of Eclampsia

- Placental abruption
- Pulmonary edema
- Aspiration pneumonia
- Cerebral hemorrhage
- Renal tubular necrosis
- Liver rupture
- Retinal detachment
- Disseminated intravascular coagulation (DIC)

Management of Eclamptic Convulsion

Life-threatening emergency requiring immediate action

- Prevent injury to woman
- Maintain airway
- Magnesium Sulfate to control convulsion



Management of Eclamptic Convulsion

Magnesium Sulfate Regime

- 4-6g loading dose given over 15 min followed by 2-3g/hr maintenance – onset of action is immediate
- If seizure reoccurs, may administer another 2g over 5 min
- If seizure continues or reoccurs may sedate, intubate and ventilate

Discharge Planning/ Teaching

- Any patient treated for hypertension or preeclampsia **f/u in 3-7 days**
- Delivery is not a cure- Preeclampsia can occur up to 6 weeks PP
- Teach symptoms of Preeclampsia to **all patients**

Ask Your Doctor or Midwife

Preeclampsia

What Is It?
Preeclampsia is a serious disease related to high blood pressure. It can happen to any pregnant woman.

Risks to You	Risks to Your Baby
<ul style="list-style-type: none">• Seizures• Stroke• Organ damage• Death	<ul style="list-style-type: none">• Premature birth• Death

Signs of Preeclampsia

 Stomach pain	 Headaches
 Feeling nauseous; throwing up	 Seeing spots
 Swelling in your hands and face	 Gaining more than 5 pounds in a week

What Should You Do?
Call your doctor right away. Finding preeclampsia early is important for you and your baby.

For more information go to www.preeclampsia.org
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AWHONN Post Birth Warning Signs Handouts

SAVE YOUR LIFE:

Get Care for These POST-BIRTH Warning Signs

Most women who give birth recover without problems. But any woman can have complications after the birth of a baby. Learning to recognize these POST-BIRTH warning signs and knowing what to do can save your life.

**POST-
BIRTH
WARNING
SIGNS**

Call 911
if you have:

- ☐ **P**ain in chest
- ☐ **O**bstructed breathing or shortness of breath
- ☐ **S**eizures
- ☐ **T**houghts of hurting yourself or your baby

**Call your
healthcare
provider**
if you have:

(If you can't reach your
healthcare provider,
call 911 or go to an
emergency room)

- ☐ **B**leeding, soaking through one pad/hour, or blood clots, the size of an egg or bigger
- ☐ **I**ncision that is not healing
- ☐ **R**ed or swollen leg, that is painful or warm to touch
- ☐ **T**emperature of 100.4°F or higher
- ☐ **H**eadache that does not get better, even after taking medicine, or bad headache with vision changes

**Trust
your instincts.**
ALWAYS get medical
care if you are not
feeling well or
have questions or
concerns.

**Tell 911
or your
healthcare
provider:**

"I had a baby on _____ and
(Date)
I am having _____"
(Specific warning signs)

These post-birth warning signs can become life-threatening if you don't receive medical care right away because:

- Pain in chest, obstructed breathing or shortness of breath (trouble catching your breath) may mean you have a blood clot in your lung or a heart problem
- Seizures may mean you have a condition called eclampsia
- Thoughts or feelings of wanting to hurt yourself or your baby may mean you have postpartum depression
- Bleeding (heavy), soaking more than one pad in an hour or passing an egg-sized clot or bigger may mean you have an obstetric hemorrhage
- Incision that is not healing, increased redness or any pus from episiotomy or C-section site may mean you have an infection
- Redness, swelling, warmth, or pain in the calf area of your leg may mean you have a blood clot
- Temperature of 100.4°F or higher, bad smelling vaginal blood or discharge may mean you have an infection
- Headache (very painful), vision changes, or pain in the upper right area of your belly may mean you have high blood pressure or post birth preeclampsia

**GET
HELP**

My Healthcare Provider/Clinic: _____ Phone Number: _____
Hospital Closest To Me: _____



This program is supported by funding from Merck, through Merck for Mothers, the company's 10-year, \$500 million initiative to help create a world where no woman dies giving life. Merck for Mothers is known as MSD for Mothers outside the United States and Canada.

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Prognosis and Long Term Effects of Eclampsia

- Women with severe preeclampsia ↑ risk of developing cardiovascular disease later in life
 - Hypertension, Ischemic heart disease, Stroke
- Preeclampsia with preterm delivery is a strong risk factor for CV disease (AHA)
- Conclusion of all is that pregnancy may be a screening test for chronic hypertension and CV disease

Prevention of Preeclampsia



- ACOG supports the recommendation to consider the use of low-dose aspirin (81 mg/day), initiated between 12 and 28 weeks of gestation, for the prevention of preeclampsia, and recommends using for the high-risk factors listed below.
 - History of preeclampsia, especially if accompanied by an adverse outcome
 - Multifetal gestation
 - Chronic hypertension
 - Diabetes (Type 1 or Type 2)
 - Renal disease
 - Autoimmune disease (such as systematic lupus erythematosus, antiphospholipid syndrome)

Take Aways

- Uncontrolled hypertension can lead to stroke...death
- Time is Brain – give antihypertensive ASAP
- Severe hypertension (160 systolic **OR** 110 diastolic)
 - is always pathologic