2006 Yearly Competencies

OB Inpatient Units

High Alert Medications: Definition

- High alert medications are defined as those medications which could cause an immediate life threatening condition for the patient if an error in administration occurs

High Alert Medications: Double Check

- For IV administration, two RNs will complete the double check procedure
- High alert medications will be double checked by two RNs or an RN and an MD

What Is a Double Check?

- Each person independently compares the label and product contents in hand versus the written order and EMAR (if it is the first dose) or label and product contents with EMAR (for subsequent doses)

High Alert Medications: Pump Check Procedure

- Infusion pump settings will be double-checked for high alert medications including correct rate on initiation of infusion. The RN will double check pump rates for Magnesium Sulfate and Pitocin against set dosage schedules posted on IV pumps

High Alert Medications: IV Pump Administration

- When a medication is administered as a continuous primary infusion (insulin, magnesium sulfate, oxytocin etc.),
  - No other infusions are to be connected above the infusion pump. If a connection needs to be made, it must be connected below the infusion pump, close to the IV site

High Alert Medications: OB Inpatient Units

- Insulin
- Magnesium Sulfate
- Labetalol
- Heparin
- Hydralazine
- Oxytocin
- Terbutaline
- Nifedipine

Magnesium Sulfate: Preterm Labor

- Magnesium Sulfate is a CNS depressant as well as a smooth, skeletal, and cardiac muscle depressant.
- Used for preterm labor because of its potential to decrease muscle contractility
- Usual dose is an initial 4 gm loading dose IV over 30 minutes, with subsequent continuous infusion rate of 2-4 gms/hr

Magnesium Sulfate: Preeclampsia

- When administered parenterally in doses sufficient to produce hypermagnesemia (serum magnesium concentrations greater than 2.5 meq/dl) Magnesium Sulfate may depress the CNS and block peripheral neuro-muscular transmission, producing anti-convulsant effects
- Usual dose is an initial 4-6 gm loading dose IV over 30 minutes, with subsequent continuous infusion rate of 2 gms/hr

Magnesium Sulfate

- In the therapeutic range (4.8 to 9.6 mg/dL) magnesium sulfate slows neuromuscular conduction, depresses the vasomotor center, and depresses central nervous system irritability
- Side effects and toxicity are dose dependent and include flushing, nausea and headaches
- Magnesium sulfate circulates largely unbound to protein and is excreted in the urine, therefore, safe clinical practice requires an accurate record of intake and output

Magnesium Sulfate Toxicity

- Magnesium toxicity results in loss of DTRs and progressive muscle weakness, including the diaphragm and other respiratory muscles, leading to acute respiratory failure
- Overdose of magnesium sulfate depresses the respiratory center in the brain further inhibiting respirations
- Magnesium sulfate slows neuromuscular conduction and depresses central nervous system irritability

Magnesium Sulfate Toxicity: Calcium Gluconate

- One ampule of calcium gluconate 1 gm (10 ml of a 10% solution) IV is given over 2-3 minutes
- If respiratory arrest occurs, ventilation should be supported until the antidote takes effect
- While significantly high values (30-35 mg/dL) are reported to be necessary for cardiac arrest, untreated respiratory arrest will lead to cardiac arrest as the cardiac muscle becomes hypoxic and ischemic

Nursing Assessments: Magnesium Sulfate

- In theory, a thorough maternal assessment including vital signs, level of consciousness, muscle tone, and DTRs should be sufficient to determine if magnesium levels are excessive
- Maternal assessment can also determine if therapeutic levels of magnesium sulfate are present including a decrease in hyperreflexia and/or prevention of eclamptic seizures
- Therapeutic and toxic serum levels of magnesium sulfate differ within and between individual patients so ultimately, determining toxicity should be more of a clinical assessment then a laboratory evaluation

Deep Tendon Reflexes

- Reflexes are usually graded on a 0-4 scale:
  - 4=very brisk (often associated with clonus)
  - 3=brisker than average (can indicate clonus)
  - 2=average/normal
  - 1=diminished (often abnormal)
  - 0=absent (abnormal)

It is generally assumed that the patient with normal (2) reflexes has a serum level of magnesium sulfate below 8-12 mg/dL because reflexes are often absent at these levels or higher

Magnesium Sulfate and FHR

- May decrease the variability of the baseline fetal heart rate and there may be fewer heart rate accelerations during administration of magnesium sulfate. These changes are not usually clinically significant

Conditions That May Make Magnesium Sulfate Accidents More Likely

- Transfer of patient
- Change of shift/change of nurse care provider/handoffs
- High census, inadequate staffing
- Chaotic environment
- Multiple pump settings
- Nurses mixing their own IV magnesium solutions
- Inadequate labeling of IV fluids
- Not removing the magnesium sulfate from the Y-port after the order to discontinue the infusion
- Line removed from the pump, free flow
- Assuming women on magnesium sulfate are “stable”

Interventions that Promote Patient Safety: Magnesium Sulfate

- Administer IV magnesium sulfate only through a controlled infusion device with free-flow protection
- Avoid using double and triple concentrations for fluid restrictions
- Use 500 ml bags with 20 gms of magnesium sulfate to differentiate from the 1000 cc maintenance IV
- Provide 1:1 nursing care for the first hour of magnesium sulfate administration
- Provide 1:1 nursing care for women in labor receiving magnesium sulfate

Interventions that Promote Patient Safety: Magnesium Sulfate

- Women who receive magnesium sulfate remain high risk even when symptoms of preeclampsia are stable
- Have a second nurse check the initial magnesium sulfate IV bag and pump settings (and every magnesium sulfate IV bag that is added and each subsequent rate change)
- When care is transferred to another nurse have both nurses review IV set-up and pump settings as well as physician orders
- Completely discontinue the medication by removing the line from the IV port
- Do not abbreviate magnesium sulfate as MgSO4 anywhere in the medical record. Magnesium sulfate must always be spelled out completely

Oxytocin

- Oxytocin (Pitocin) is a synthetic endogenous hormone which exerts a stimulatory effect on the smooth muscle of the uterus and blood vessels
- Oxytocin stimulates rhythmic contractions of the uterus increasing both the frequency of existing uterine contractions and raises the tone of the uterine musculature

Oxytocin: Effects on the Cardiovascular System

- Initially, the blood pressure may decline, but with prolonged administration, a 30% increase in baseline blood pressure can occur
- Cardiac output and stroke volume increase
- With doses of 20 mu/min or above, the antidiuretic effect of oxytocin results in decreased urinary output
- Maternal water intoxication and fetal hyperbilirubinemia have been associated with prolonged infusions at high dosages

Oxytocin: Precautions, Considerations, and Observations

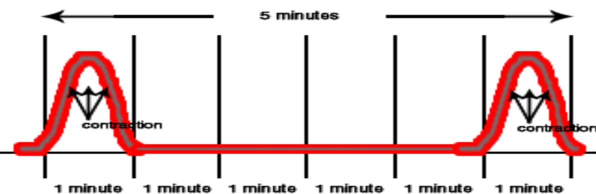
- Indications for terminating the oxytocin infusion include;
  - Tetanic or prolonged contractions lasting more than 2 minutes
  - Uterine hypertonus or hyperstimulation
  - Unusual abdominal pain
  - Unusual vaginal bleeding
  - Fetal compromise as evidenced by late decelerations, prolonged decelerations, and/or sustained bradycardia

Oxytocin: Precautions, Considerations, and Observations

- Encourage the lateral recumbent or sitting position to avoid maternal hypotension and/or decreased placental perfusion from aorta caval compression
- Observe for uterine atony after the patient has received high doses of oxytocin for long periods of time

Oxytocin: Precautions, Considerations, and Observations

- Whenever oxytocin is infused, palpate the uterus to be sure it is relaxing between contractions. If the uterus is not relaxing, discontinue oxytocin, turn patient to her side, and notify the caregiver
- Patients receiving prolonged infusions at high doses should be observed for signs and symptoms of water intoxication, including headache, N/V, mental confusion, decreased urinary output, hypotension, tachycardia, and cardiac arrhythmias



Hydralazine

- Hydralazine is a potent vasodilator which decreases cardiac afterload by acting directly on vascular smooth muscle. It increases cardiac output, renal blood flow, uterine blood flow, cerebral blood flow and oxygen consumption, while decreasing systemic and pulmonary vascular resistance
- Following IV use the hypotensive effects of this drug develop gradually over 15-30 minutes, peaking at 20 minutes

Hydralazine

- The initial bolus of hydralazine should never exceed 5 mg
- The usual dose is 5-10 mg to be repeated every 30 minutes, as needed
- Excessive reduction of B/P can occur when the dose is repeated or when shorter intervals or continuous infusions are used

Hydralazine: Side Effects

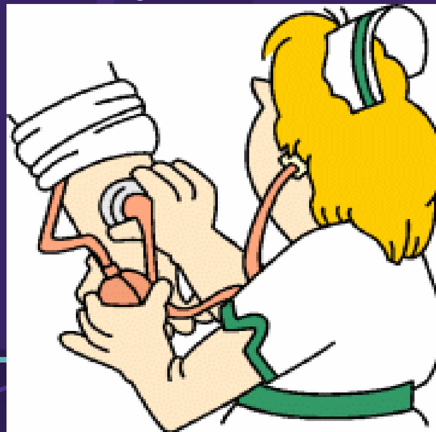
- The main side effects are tachycardia, fluid retention and headache
- It may also cause palpitations, N/V, dizziness and nasal congestion

Hydralazine: Precautions, Considerations, Observations

- Administer hydralazine directly into the needle-free T-connector extension tubing with physician present at the time of administration or the physician my administer the hydralazine if preferred
- The nurse administering the medication should stay with the patient during the 30 minutes following IV push administration
- B/P, P, R and FHR should be recorded every 5 minutes for 30 minutes following IV push administration

Hydralazine: Precautions, Considerations, Observations

- Maternal diastolic pressure should be maintained between 90-100 mm Hg to maintain uteroplacental perfusion
- Intake and output should be recorded hourly and a foley catheter placed



Labetalol

- Labetalol is a combined alpha and beta blocking agent. Theoretically, it is less likely to reduce cardiac output and subsequently uterine blood flow
- Produces dose-related falls in blood pressure without reflex tachycardia and without significant reduction in heart rate

Labetalol

- The initial dose of Labetalol is 20 mg per slow IV injection over a 2 minute period
- B/P, pulse, respirations and FHR are taken before the injection and every 5 minutes for 30 minutes after the injection
- Additional injection boluses of 40 mg and then 80 mg can be given at 10 minute intervals until the desired B/P is achieved

Labetalol: Side Effects

- Postural hypotension, dizziness, N/V, tingling in the skin or scalp
- The head of the bed should be at about a 30 degree angle with the hip bumped to the left or the right side

Labetalol: Precautions, Considerations, Observations

- The nurse should remain with the patient for 30 minutes following the last bolus injection given or until the blood pressure is stable
- Intake and output should be recorded hourly and a foley catheter placed
- Maternal diastolic pressure should be maintained between 90-100 mm Hg to maintain uteroplacental perfusion

Nifedipine

- Nifedipine is a calcium channel blocker. Tocolysis or uterine relaxation is thought to occur as a result of interference with the movement of extracellular calcium into the calcium channels of the cells of the myometrium
- After oral administration, maximum plasma levels occur in 20-30 minutes

Nifedipine

- The loading dose of nifedipine for tocolysis is 10 mg PO every 15 minutes if contractions persist, up to 40 mg within the first hour
- The maintenance dose is 10-20 mg PO every 4-6 hours, and should be given up to 48 hours after the first dose of corticosteroids

Nifedipine: Side Effects

- The most common maternal side effects include facial flushing, headache and nausea. Other side effects include transient tachycardia, palpitations, and lightheadedness
- Nifedipine is contraindicated in maternal liver disease
- No neonatal side effects of maternal administration have been reported

Nifedipine: Precautions, Considerations, Observations

- Continue to monitor B/P, pulse, uterine activity and FHR every 15 minutes until loading dose is complete and the maintenance dose begins and then immediately prior to each subsequent dose
- Hold dose and notify physician for B/P less than 100/60 and sustained maternal tachycardia greater than 120 bpm

Administration of Other IV Push/IV Drip Medications

- For information on how to administer other IV Push/Drip Medications, please see:
  - #08.021 Administration of Intravenous Push Medications by RNs in Adult Patients
  - #08.025 Administration of Intravenous Drip Medications by RNs to Adult Patients
- These policies are in the medication reference books in your unit medication rooms as well as the IPR Web Links under UIHC Standards of Practice