Feel the Surge

Using simulation to birth new RN's to the obstetric specialty

Objectives

- Identify a benefit of orientation standardization across a large health system
- Describe how to use multiple learning modalities to create an experiential learning event.
- Describe an opportunity to use simulation-based learning in your orientation process.

Disclosures

- We shared a cubicle for a year
- We've been on the road together providing education and doing a lot of Simulation
- We tend to finish each other's sentences
- We get a little goofy with our mannequins

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Allina Mother Baby Clinical Service Line

- 13 hospitals
- 11 Birthing Units
- Collaboration/Standardization to ensure best practice
  - Allina Pregnancy Care Council
  - OB Leaders
  - OB Educators

Background

2/4/2013 - The Mother Baby Center at Abbott Northwestern and Children's Minneapolis

10/26/2015 - The Mother Baby Center at United Hospital and Children's St Paul

7/27/2015 - The Mother Baby Center at Mercy with Children's Coon Rapids

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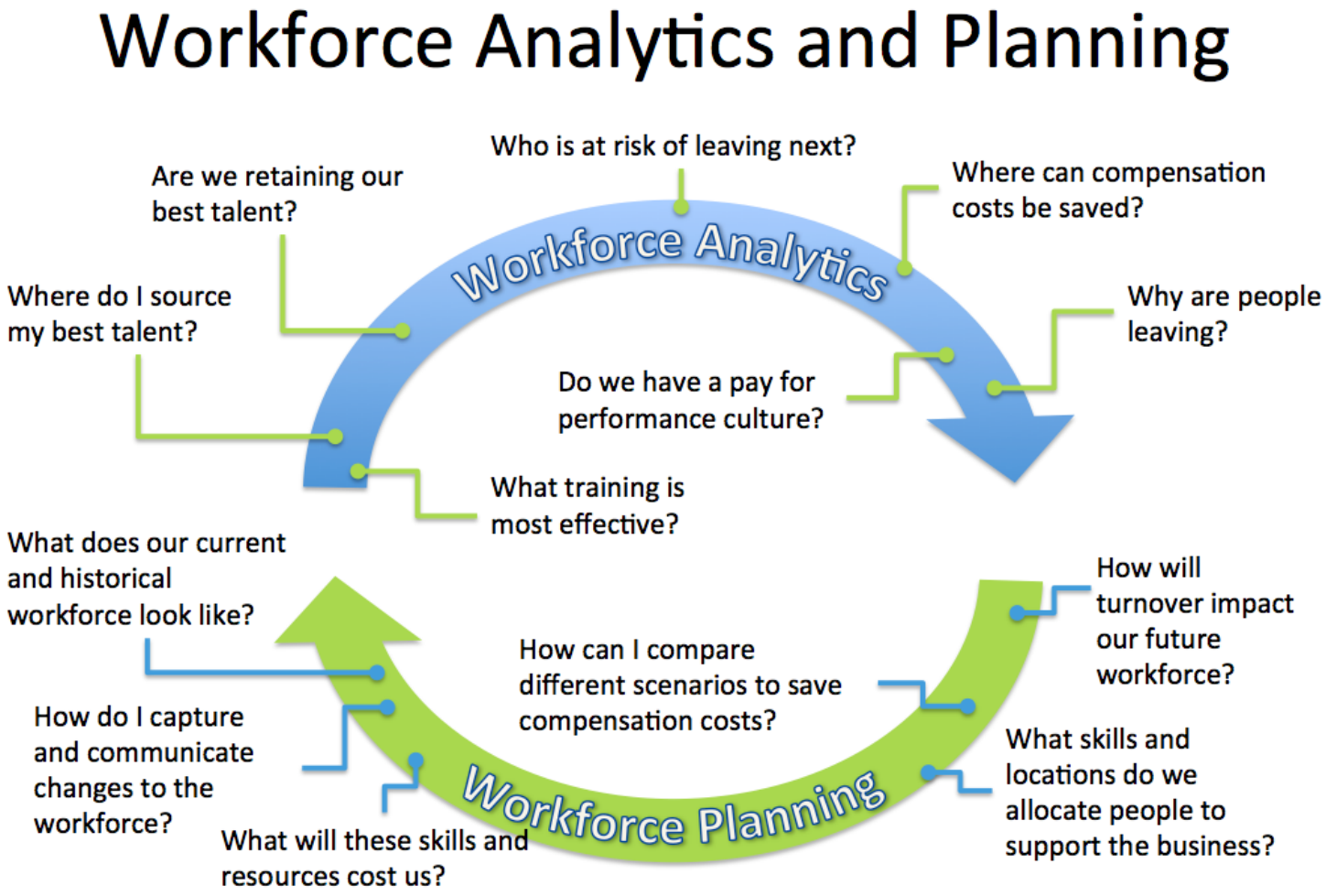
Background

New Hires

- 2011 = 64
- 2012 = 65
- 2013 = 135
- 2014 = 68
- 2015 = 124
- 2016 = 139
- 2017 = 105 to date

Scope/Stakeholders



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Background

Workforce Analytics and Planning

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Recommendations

- OB Quickguides
  - New Grad
  - Experienced RN, new to the Specialty
  - RN experienced in OB, new to Allina
  - RN experienced in OB, transfer within Allina

- Orientation Classes
  - Changed audience and timing of classes
  - More focus on flipped classroom/experiential learning…

OB ORIENTATION SIMULATION DAY

Design

- Our Objective: Mixed active-learning modalities
  - Simulation
  - Case Study with hands on practice
  - Small group didactic with discussion and demonstration
  - Key takeaways: Early recognition, calling for help, communication during the event
- Topics:
  - Shoulder Dystocia
  - Post Partum Hemorrhage
  - Neonatal Code
  - Diabetes
  - Preeclampsia
  - Leopold's/Positioning

Design

- Shoulder Dystocia
  - Recognition of risk factors and signs of shoulder dystocia
  - Demonstration of correct application of Shoulder dystocia maneuvers (suprapubic pressure and McRoberts Maneuver)

Design

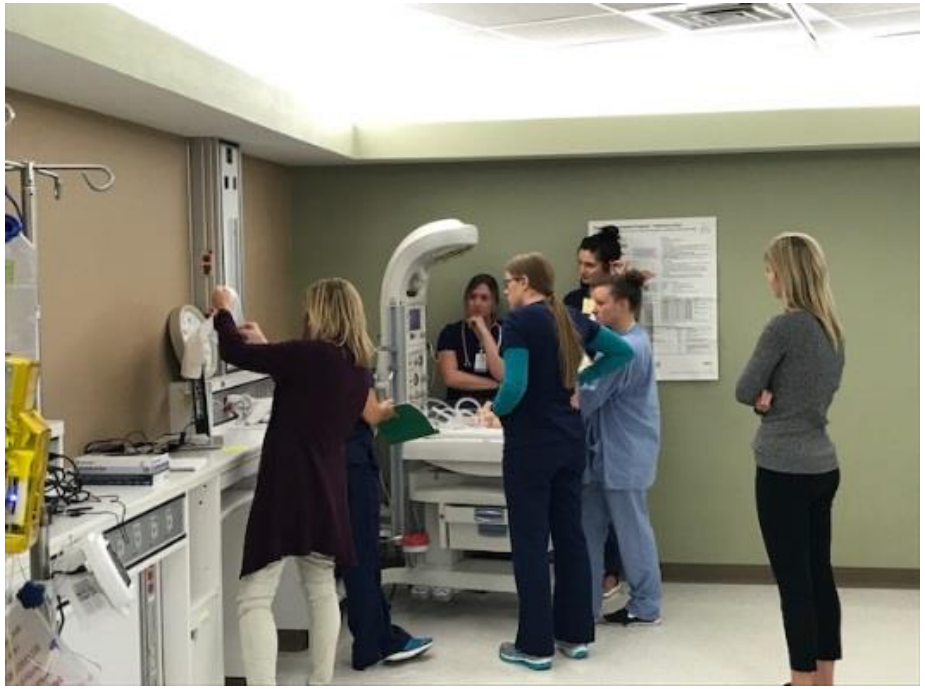
- Postpartum Hemorrhage
  - Recognition of post-partum hemorrhage

and application of interventions utilizing post-partum hemorrhage checklist

  - Applies pharmacological measures to treat uterine atony

Design

- Neonatal Code
  - Demonstration of initial steps of resuscitation and correct administration of PPV

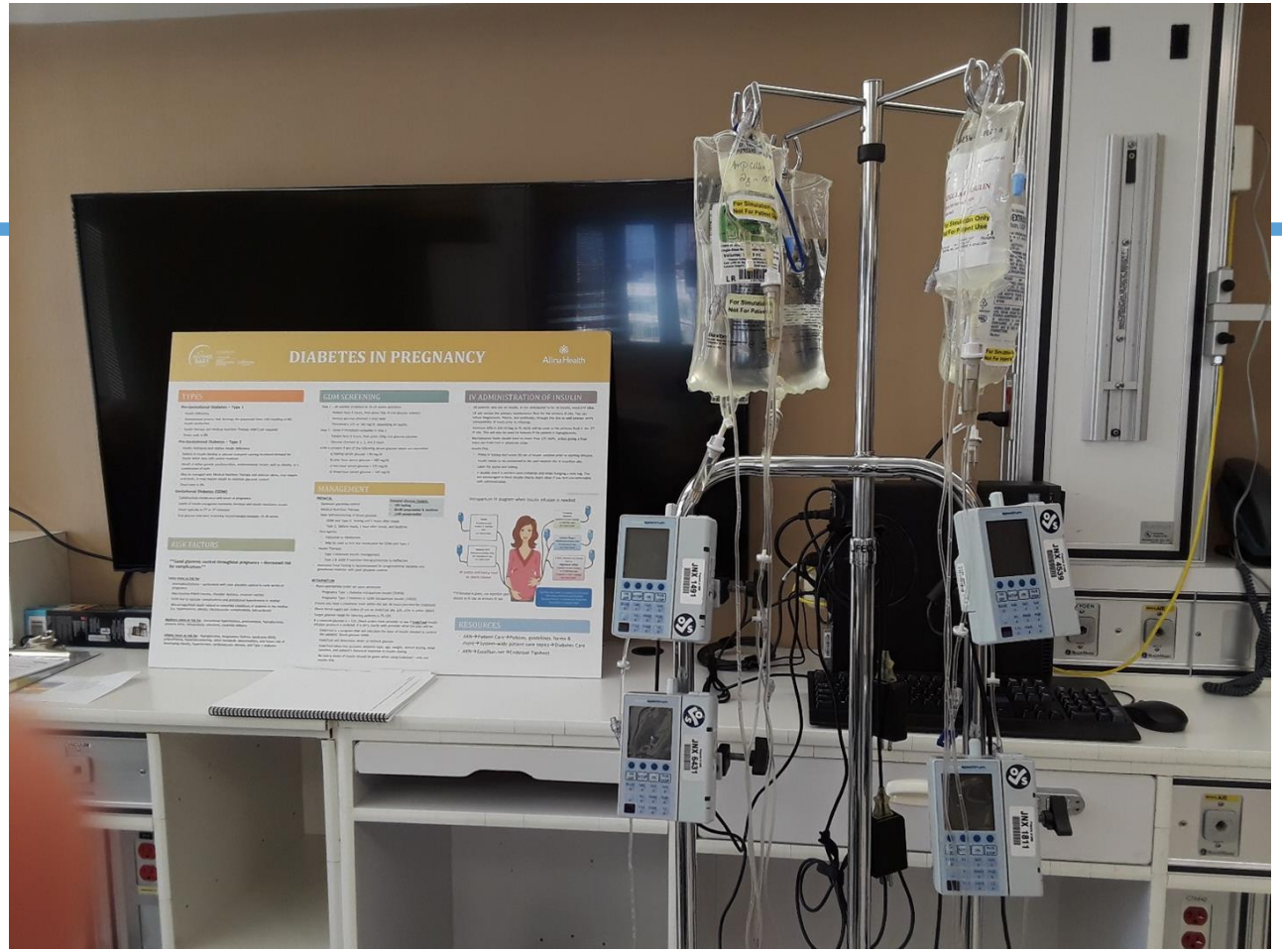


Design

- Diabetes
  - Discuss differences between types of

  diabetes: pre-gestational vs gestational
  - Demonstrate IV setup for insulin infusion

  during labor
  - Utilize the hypoglycemia algorithm to manage baby's glucose



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DIABETES IN PREGNANCY

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TYPES

Pre-Gestational Diabetes – Type 1

- Insulin deficiency
- Autoimmune process that destroys the pancreatic beta cells resulting in NO insulin production
- Insulin therapy and Medical Nutrition Therapy (MNT) are required
- Onset early in life

Pre-Gestational Diabetes – Type 2

- Insulin resistance and relative insulin deficiency
- Defects in insulin binding or glucose transport causing increased demand for insulin which beta cells cannot maintain
- Result of either genetic predisposition, environmental factors such as obesity, or a combination of both
- May be managed with Medical Nutrition Therapy and exercise alone, may require oral meds, or may require insulin to maintain glycemic control
- Onset later in life

Gestational Diabetes (GDM)

- Carbohydrate intolerance with onset of pregnancy
- Levels of insulin-antagonist hormones increase and insulin resistance occurs
- Onset typically in 2nd or 3rd trimester
- Oral glucose tolerance screening recommended between 24-28 weeks

RISK FACTORS

****Good glycemic control throughout pregnancy = decreased risk for complications****

Fetus more at risk for:

- Anomalies/Defects – particularly with poor glycemic control in early weeks of pregnancy
- Macrosomia→birth trauma, shoulder dystocia, cesarean section
- IUGR due to vascular complications and gestational hypertension in mother
- Miscarriage/fetal death related to comorbid conditions of diabetes in the mother (i.e. hypertension, obesity, microvascular complications, ketoacidosis)

Mothers more at risk for: Gestational hypertension, preeclampsia, hypoglycemia, preterm labor, ketoacidosis, infections, cesarean delivery

Infants more at risk for: Hypoglycemia, Respiratory Distress Syndrome (RDS), polycythemia, hyperbilirubinemia, other metabolic abnormalities, and future risk of developing obesity, hypertension, cardiovascular disease, and Type 2 diabetes

GDM SCREENING

Step 1 – All women screened at 24-28 weeks gestation

- Patient fasts 8 hours, then given 50g of oral glucose solution
- Venous glucose checked 1 hour later
- Threshold = 135 or 140 mg/dL depending on facility

Step 2 – Done if threshold exceeded in step 1

- Patient fasts 8 hours, then given 100g oral glucose solution
- Glucose checked at 1, 2, and 3 hours

GDM is present if any of the following serum glucose values are exceeded:

- a) fasting serum glucose > 95 mg/dl
- b) one- hour serum glucose > 180 mg/dL
- c) two-hour serum glucose > 155 mg/dL
- d) three-hour serum glucose > 140 mg/dL

MANAGEMENT

Prenatal Glucose Targets:

- **≤95 fasting**
- **60-99 preprandial & bedtime**
- **≤140 postprandial**

PRENATAL

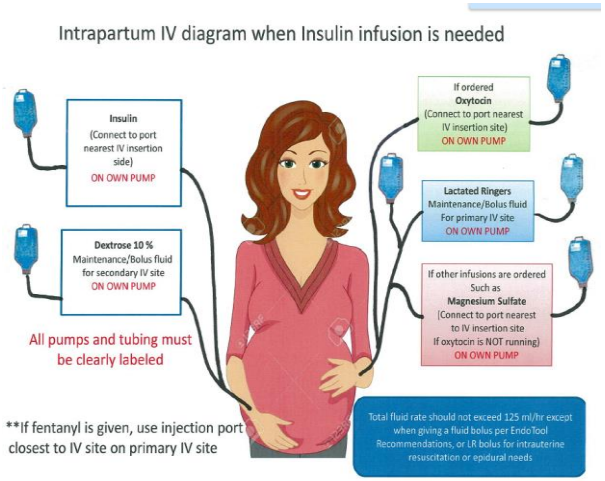
- Optimum glycemia control
- Medical Nutrition Therapy
- Daily Self-monitoring of blood glucose:
  - GDM and Type 2: fasting and 1 hours after meals
  - Type 1: before meals, 1 hour after meals, and bedtime
- Oral Agents:
  - Glyburide or Metformin
  - May be used as first line medication for GDM and Type 2
- Insulin Therapy:
  - Type 1-intensive insulin management
  - Type 2 & GDM if nutrition therapy/exercise is ineffective
- Antenatal Fetal Testing is recommended for pregestational diabetes and gestational diabetes with poor glycemic control

INTRAPARTUM

- Place appropriate order set upon admission
  - Pregnancy Type 1 Diabetes Intrapartum Insulin [30858]
  - Pregnancy Type 2 Diabetes or GDM Intrapartum Insulin [30859]
- Ensure you have a creatinine level within the last 48 hours (needed for Endotool)
- Check blood sugars per orders (If not on EndoTool yet, q2h, q1hr in active labor)
- Target glucose range for laboring patients is 75-105.
- If a metered glucose is > 120, check orders from provider to see if **EndoTool** insulin infusion protocol is ordered. If it isn't, clarify with provider what the plan will be.
  - EndoTool is a program that will calculate the dose of insulin needed to control the patients' blood glucose levels
  - EndoTool will determine when to recheck glucose
  - EndoTool takes into account: diabetes type, age, weight, steroid dosing, renal function, and patient's historical response to insulin dosing
  - No Sub-q doses of insulin should be given when using Endotool – only use insulin drip

IV ADMINISTRATION OF INSULIN

- All patients who are on insulin, or are anticipated to be on insulin, need **2 IV sites**.
- LR will remain the primary maintenance fluid for the primary IV site. You can infuse Magnesium, Pitocin, and antibiotics through this line as well (always verify compatibility of meds prior to infusing).
- Dextrose 10% in 250 ml bag at 75 ml/hr will be used as the primary fluid in the 2nd IV site. This will also be used for boluses if the patient is hypoglycemic.
- Maintenance fluids should total no more than 125 ml/hr, unless giving a fluid bolus per EndoTool or physician order.
- Insulin Drip
  - Prime IV tubing and waste 20 mls of insulin solution prior to starting infusion.
  - Insulin needs to be connected to the port nearest the IV insertion site.
  - Label the pump and tubing.
  - A double check is needed upon initiation and when hanging a new bag. You are encouraged to have double checks more often if you feel uncomfortable with administration.



RESOURCES

- AKN→Patient Care→Policies, guidelines, forms & more→System-wide patient care topics→Diabetes Care
- AKN→Excellian.net→Endotool Tipsheet

Design

- PreEclampsia
  - Demonstrate assessments required for pre-eclamptic patient
  - Demonstrate MgSO4 setup: tubing setup, IV pump programming for load and maintenance

Care of the patient with preeclampsia

PATHOPHYSIOLOGY

Pathologic changes are due to disruptions in placental perfusion and endothelial cell dysfunction.

- Normally the spiral arteries in the placenta change to accommodate increased blood flow.
- In women with preeclampsia, this vascular remodeling does not occur or only partially develops.
- Results in decreased placental perfusion and hypoxia
- Placental ischemia stimulates the release of a substance that is toxic to endothelial cells.
- Leads to endothelial cell dysfunction
- Generalized vasospasm occurs.
- Results in hypertension, increased peripheral resistance, and poor tissue perfusion in all organ systems
- Increased endothelial cell permeability occurs.
- Results in intravascular protein and fluid loss and less plasma volume

DIAGNOSIS

Blood pressure	• Greater than or equal to 140 mm Hg systolic or greater than or equal to 90 mm Hg diastolic on two occasions at least 4 hours apart after 20 weeks of gestation in a woman with a previously normal blood pressure • Greater than or equal to 160 mm Hg systolic or greater than or equal to 110 mm Hg diastolic, hypertension can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy
and	
Proteinuria	• Greater than or equal to 300 mg per 24-hour urine collection (or this amount extrapolated from a timed collection) or • Protein/creatinine ratio greater than or equal to 0.3* • Dipstick reading of 1+ (used only if other quantitative methods not available)
Or in the absence of proteinuria, new-onset hypertension with the new onset of any of the following:	
Thrombocytopenia	• Platelet count less than 100,000/microliter
Renal insufficiency	• Serum creatinine concentrations greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease
Impaired liver function	• Elevated blood concentrations of liver transaminases to twice normal concentration
Pulmonary edema	
Cerebral or visual symptoms	

*Each measured as mg/dL.

Severe preeclampsia

- Systolic blood pressure of 160 mm Hg or higher, or diastolic blood pressure of 110 mm Hg or higher on two occasions at least 4 hours apart while the patient is on bed rest (unless antihypertensive therapy is initiated before this time)
- Thrombocytopenia (platelet count less than 100,000/microliter)
- Impaired liver function as indicated by abnormally elevated blood concentrations of liver enzymes (to twice normal concentration), severe persistent right upper quadrant or epigastric pain unresponsive to medication and not accounted for by alternative diagnoses, or both
- Progressive renal insufficiency (serum creatinine concentration greater than 1.1 mg/dL or a doubling of the serum creatinine concentration in the absence of other renal disease)
- Pulmonary edema
- New-onset cerebral or visual disturbances

PHYSIOLOGIC CHANGES

Decreased uteroplacental perfusion	IUGR, low birthweight, prematurity, abruption, hypoxia, fetal demise
Cardiovascular/hemodynamic	Decreased serum albumin and plasma colloid osmotic pressure, generalized edema, increased capillary permeability, pulmonary edema
Renal	Proteinuria, oliguria, increased BUN, creatinine and uric acid, renal failure
Central nervous system (CNS)	Cerebral edema or hemorrhage, increased CNS irritability, headaches, hyperreflexia w/ or w/o clonus, seizures
Ophthalmic	Light sensitivity, double vision, blind spots or loss of vision
Hepatic	Liver edema, epigastric pain or right upper quadrant pain, elevated liver enzymes

ACCURATE BLOOD PRESSURE MEASUREMENT

- Use proper size cuff- should cover 80% of upper arm or be 1.5 times the length of upper arm
- Position patient in sitting or semi reclining position. Legs uncrossed
- Let the patient rest 10 minutes after positioning
- Support the arm at the level of the heart
- No talking (nurse or patient) during BP measurement
- If elevated, rest 5-10 minutes and retake. Use the highest reading

Do not reposition the patient to either side to obtain a lower BP. This will give you a false reading

HEAD TO TOE ASSESSMENT

Nursing Assessments for Preeclampsia and Magnesium Toxicity

Assessment	Implications
Daily Weight	Provides estimate of fluid retention
Blood pressure	Determines worsening condition, response to treatment, or both
Respiratory rate, pulse, oximeter readings	Drug therapy (magnesium sulfate) causes respiratory depression. Drug should be withheld and physician notified if respiratory rate is <12 breaths/min or as specified by the organization's practice. Pulse oximeter reading should be 95% or greater.
Breath sounds	Identifies sounds of excess moisture in lungs associated with pulmonary edema.
Deep tendon reflexes/clonus	Hyperreflexia indicates increased cerebral irritability and edema; hyporeflexia is associated with magnesium excess. Clonus indicates hyperreflexia.
Edema	Provides estimation of interstitial fluid.
Urinary output	Output of at least 30 ml/hr indicates adequate perfusion of the kidneys (25 ml/hr is used by some authorities). Magnesium levels may become toxic if urinary output is inadequate.
Urine protein	Normal protein in random dipstick urine sample is negative or trace. Higher protein levels suggest greater leaking of protein secondary to glomerular damage with worsening preeclampsia. A 24-hr urine sample is most accurate for quantitative urine protein level.
Level of consciousness	Drowsiness or dulled sensorium indicates therapeutic effects of magnesium; no responsive behavior or muscle weakness is associated with magnesium excess.
Headache, epigastric pain, visual problems	These symptoms indicate increasing severity of condition caused by cerebral edema, vasospasm of cerebral vessels, and liver edema. Eclampsia may develop quickly.
Fetal heart rate and baseline variability	Rate should be between 110-160 bpm in a term fetus. Decreasing baseline variability may be caused by therapeutic magnesium level or by inadequate placental perfusion.
Laboratory data	Significant signs of increasing severity of disease are elevated serum creatinine level, elevated liver enzymes, or decreased number of platelets (thrombocytopenia). Serum magnesium levels should be in therapeutic range designated by physician. Therapeutic range for obstetric population is 5-8 mEq/L
Intake and Output	Accurate I/O essential to monitor kidney function, risk for pulmonary edema and magnesium toxicity. Total IV and oral fluids should not exceed 125 ml/hr.

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Design

- Leopold's Maneuver/Postioning
  - Demonstrate Leopolds maneuver to determine fetal position
  - Describe how assessment findings can be integrated into practice
  - Identify placement of US in relation to fetal position to obtain continuous fetal monitoring tracing

Scavenger Hunt

- Locate & identify resources available on the AKN
  - Mother/Baby CSL page on the AKN
  - Policies/Procedures
  - Mosby's Clinical Skills & Key
  - Excellian.net
  - On-line Library
  - The Mother/Baby Center Website

Delivery

- Space
- Equipment
- Agenda
- Facilitators/Sim operators
- Admin support

Delivery

Space

- New sim lab space
- 6 suites
- Flexibility and creative thinking

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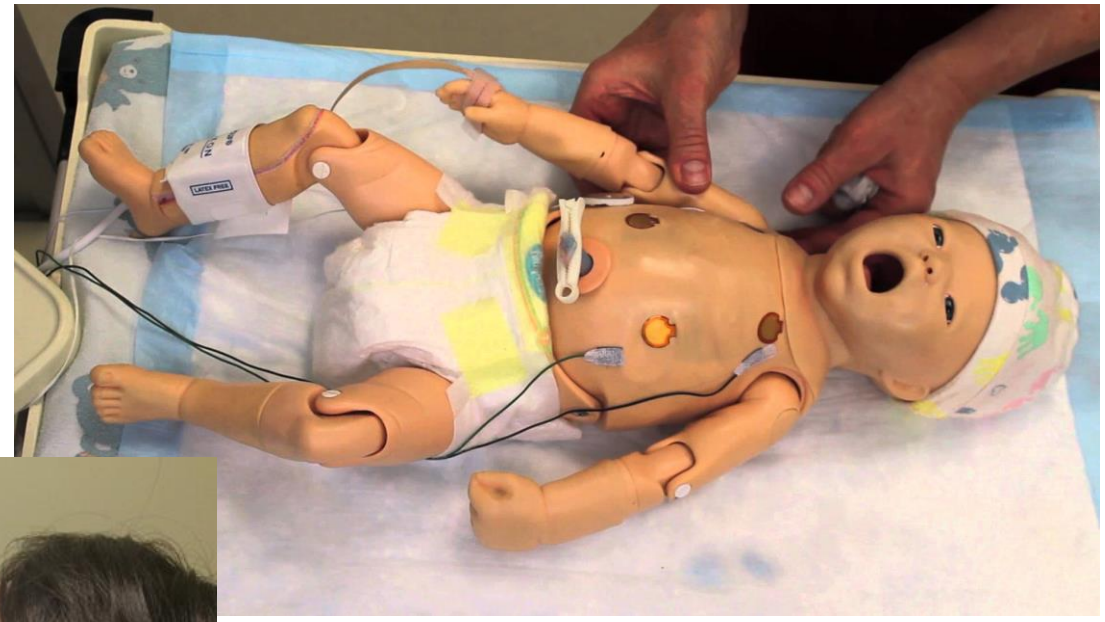
Delivery

Equipment

- Lucina
- Newborn HAL
- Task trainers
- Supplies for stations
- Rentals



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Delivery

Agenda

- 6 hour day
- Small groups

A	B	C	D	E	F	G	H
Time	Group #1	Group #2	Group #3	Group #4			
0900-0915	Welcome & Simulation Philosophy						
0915-0945	Shoulder Sim	Leopolds/EFM	Preeclampsia	Neonatal Sim		Group 1&3	Cathy
0945-1015	Shoulder Debrief	Shoulder Sim	MgSO4	Neonatal Debrief		Group 2&4	Erin
1015-1045	Neonatal Sim	Shoulder Debrief	Shoulder Sim	Scavenger Hunt		EFM/Diabetes	Alexis
1045-1115	Neonatal Debrief	Diabetes	Shoulder Debrief	Shoulder Sim		Neonatal	Amy
1115-1145	Scavenger Hunt	Lunch	Lunch	Shoulder Debrief		Preeclampsia/MgSO4	Sandy
1145-1215	Lunch	Neonatal Sim	LeopoldsEFM	Lunch		Scavenger	Emily
1215-1245	PPH Sim	Neonatal Debrief	Diabetes	Preeclampsia		PPH Sim Operator	Kim
1245-1315	PPH Debrief	PPH Sim	Scavenger Hunt	MgSO4		Shoulder Operator	Kim
1315-1345	Preeclampsia	PPH Debrief	PPH Sim	Leopolds/ EFM		Neonatal Code Operator	Pete
1345-1415	MgSO4	Scavenger Hunt	PPH Debrief	Diabetes			
1415-1445	Leopolds/ EFM	Preeclampsia	Neonatal Sim	PPH Sim			
1445-1515	Diabetes	MgSO4	Neonatal Debrief	PPH Debrief			
1515-1530	Wrap Up						

Delivery

Facilitators

- Leadership endorsement
- Every site supports
- Facilitator guide

FACILITATOR GUIDE: OB Sim Day Pre-Eclampsia/MgSO4

Time	Objectives	Materials
30 minutes	• Demonstrate assessments required for pre-eclamptic patient	• Poster (Pre-Eclampsia) • Reflex Hammer (3) • Adult Stethoscope (2) • BP Cuffs (3 sizes) • Case Scenarios (3) • DTR Tipsheet • Handout: Nursing assessment for pre-eclampsia/MgSO4 • Pre-Eclampsia Order Set (2) • Laminated Handout: Safety Reminders (2) • Laminated Handout: Patient Education (2)

EXPLAIN: Several handouts will be utilized today; Resource for materials was Mosby's Skills and can be accessed on the AKN; know your resources

EXPLAIN: Pathophysiology of Pre-Eclampsia

- Disruption in placental perfusion & endothelial cells
- Normally, arteries in the placenta change to accommodate increased blood flow
- In pre-eclampsia, vascular changes do not occur or only partially occur
- Decreased placental perfusion and hypoxia occur
- Placental ischemia stimulates a substance that is toxic to endothelial cells
- Result is vasospasms, hypertension, increased peripheral resistance, & poor tissue perfusion in all organ systems

Sim operators

2/class

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Administrative support

- Printing
- Office supplies
- Create folders
- Manage LMS
- Roster
- Directions
- Check in
- Parking

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Evaluation

it was a very good class and a great learning experience

Survey monkey evaluation

how to communicate and handle emergency situations

Ask for help, work as a team, and establish a leader in crisis situations.

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In Summary…

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References

- Ackermann, A.D., Kenny, G., & Walker, C. (2007). Simulator programs for new nurses' orientation. *Journal for Nurses in Professional Development, 23* (3) 136-139.
- Disher, J., Burgum, A., Desai, A., Fallon, C., Hart, P.L., & Aduddell, K. (2014). The effect of unit-based simulation on nurses' identification of deteriorating patients. *Journal for Nurses in Professional Development, 30* (1), 21-28. DOI: 10.1097/NND.0b013e31829e6c83
- Hales, R., & Tuttle, S. (2015). Boot Camps. In Palaganas, J.C., Maxworthy, J.C., Epps, C.A., & Mancini, M.E. (Eds.), *Defining excellence in simulation programs* (pp. 135-152). Philadelphia: Wolters Kluwer.
- Hommes, T. (2014). Implementation of simulation to improve staff nurse education. *Journal for Nurses in Professional Development, 30* (2), 66-69. DOI: 10.1097/01.NND.0000433144.66804.4c
- International Nurses Association for Clinical Simulation Board of Directors. (2011). Standards of Best Practice: Simulation. Clinical Simulation in Nursing. 7(4S). S1-S19.
- Johnston, P.A, & Ferraro, C.A. (2001). Application of critical pathways in the maternity nursing orientation process. *Journal for Nurses in Staff Development*, *17* (2), 61-66.
- Leigh, G. (2011). The simulation revolution. *Journal for Nurses in Staff Development*, *27* (2), 54-57. DOI: 10.1097/NND.0b013e31820eecea
- Maneval, R., Fowler, K.A., Kays, J.A, Boyd, T.M., Shuey, J., Harne-Britner, S., & Mastrine, C. (2012). The effect of high-fidelity patient simulation on the critical thinking and clinical decision-making skills of new graduate nurses. *The Journal of Continuing Education in Nursing*, *43* (3), 125-134. DOI: 10.3928/00220124-20111101-02
- Merchant, D.C. (2012). Does high-fidelity simulation improve clinical outcomes? *Journal for Nurses in Staff Development*, *28* (1), E1-E8. DOI: 10.1097/NND.0b013e318240a728
- Morrison, J., & Deckers, C. (2015). Common theories in healthcare simulation. In Palaganas, J.C., Maxworthy, J.C., Epps, C.A., & Mancini, M.E. (Eds.), *Defining excellence in simulation programs* (pp. 496-508). Philadelphia: Wolters Kluwer.
- Olejniczak, E.A., Schmidt, N.A., & Brown, J.M. (2010). Simulation as an orientation strategy for new nurse graduates: An integrative review of the evidence. *Simulation in Healthcare, 5* (1), 52-57. DOI: 10.1097/SIH.0b013e3181ba1f61
- Palaganas, J., Maxworthy, J., Epps, C., & Mancini, M. (2015). *Defining Excellence in Simulation Programs.* Philadelphia: Wolters Kluwer.