The Course of a Normal Pregnancy can Complicate the Disease; The Course of the Disease can Complicate the Pregnancy (Fetus, Baby, and Mother)

Cardiovascular Disease
- During Pregnancy the cardiovascular system is taxed normally:
  - Blood Volume Increases by 1000-1500 milliliters
    40% increase over pre-pregnancy volume, peaks around 20-24 wks.
  - Heart rate increases, CO increases 30%
  - Systemic vascular resistance decreases, blood pressure varies

Pregnancy at Risk: Pre-existing Conditions
- Safe, Effective Care
- Unique Needs
- “Normal” Needs, Feelings, Discomforts

Primary Objective:
  Guide and Support Anticipatory Guidance
Classification of Heart Disease

- **Class I**
  Uncompromised, no limitations to physical activity. No symptoms of cardiac insufficiency or angina.

- **Class II**
  Slightly compromised. Slight limitation of physical activity. Routine activity causes excessive fatigue, palpitations, dyspnea, or angina.

- **Class III**
  Markedly compromised. Moderate to marked limitation in physical activity. During less than usual activity, experiences fatigue, palpitations, dyspnea, or angina.
Classification of Heart Disease

- Class IV       Severely compromised. Unable to carry out any physical activity without experiencing discomfort. Symptoms even at rest.

- From New York State Heart Association

Basic, Practical Guide

- Frequent Visits
- Good Patient Cooperation
- Appropriate OB Care
- Team Approach

These Changes Normal/OK in Pregnancy:

- Volume increases
- ID heart murmur for 1st time
- Heart palpitations on sudden exertion
- Increased heart rate
- Changes in BP
IF...

- Myocardial disease develops
- Valvular disease exists
- Congenital heart problems

→ ANTICIPATE CARDiac DECOMPENSATION!

The Danger of Pregnancy in a Woman with Cardiac Disease:

- Occurs mainly because of increased circulatory volume!
- So what would you look for???

Left-Sided Heart Failure

- Left ventricle cannot move the volume of blood forward that is received by the left atrium from the pulmonary circulation
- Mitral stenosis, valve, insufficiency, rheumatic fever, aortic coarctation
What Will Patient Exhibit?

- Increased respiratory rate
- Fatigue, weakness, dizziness
- Increased heart rate, peripheral vasoconstriction
- Sodium, water retention
- Orthopnea, nocturnal dyspnea
- MOIST COUGH, CRACKLES

Mitral Valve Prolapse

- 10% of women, usually benign
- Usually well tolerated in pregnancy
- Decreased vascular resistance in pregnancy favors forward blood flow
- May hear murmur, usually asymptomatic, sometimes CP at rest, anxiety, palpitations, dyspnea, syncope

However....

- Prophylaxis with antibiotics for labor/delivery
- Ampicillin, Pen G, cephalaxin, cloxac, erythromycin, azithromycin
- INFECTIVE ENDOCARDITIS
  - Major ABX, Prevent CHF, Emboli, Death
Right-Sided Heart Failure

- Occurs when the output of the right ventricle is less than the blood volume received from the right atrium
- Back Pressure causes congestion of systemic circulation and decreased CO to lungs
- Congenital heart, ASD, VSD, Pulmonary valve stenosis, Eisenmenger

Peripartal Cardiomyopathy

- 25-50% Mortality
- Due to effects of pregnancy on the CV system – CHF!
- Postpartum Recovery Vs Heart Transplant

Nursing Assessment of Cardiac Pt.

- Continuous, probably weekly:
- Document Pre-Pregnancy cardiac status:
- Observe/report immediately:
- Factors increasing stress on heart:
Prenatal Interventions...

- ***SUDDEN INABILITY to perform activities she has been comfortable doing previously
- (not just that she is tired or doesn’t feel like vacuuming, has a cold, etc.)
- 8-10 hours sleep each night
- 30 minute nap after meals
- Limit activities to functional classification
- Avoid heavy exertion
- Bed Rest – class III and IV

Nursing Diagnosis

- Activity Intolerance r/t effects of pregnancy on the patient with heart disease (rheumatic or valvular)

DANGER!

- Sudden inability to perform usual activities
- (Sudden change in activity level from what she was comfortable doing earlier)
Nursing Diagnosis

- Therapeutic Regimen: individual risk for ineffective management r/t woman’s first pregnancy and perceived sense of wellness

Nursing Diagnosis

- Decreased cardiac output r/t increased circulatory volume secondary to pregnancy and cardiac disease

Nursing Diagnoses

- Fear r/t peripartum risks
- Knowledge deficit regarding effects on pregnancy and fetus
- Risk for self-care deficit
- Impaired home maintenance mgmt
- Family implications?? r/t culture??
General Interventions

- Remember basic, practical guide
- Anticipate cardiac decompensation
- Teach, anticipatory guidance
- Prenatal
- Intrapartal
- Postpartal

Intrapartum Interventions...

- This is an additional burden on the CV system
- Vaginal birth is recommended; labor in side-lying, sitting upright position
- Epidural – minimize valsalva
- Assess decompensation!!
- Observe for HR>100, resp>25, cough, crackles, pale, clammy, cool

Postpartal interventions...

- assessing for cardiac decompensation is critical!
- 24-48 hours is most hemodynamically difficult
- Cardiac output increases rapidly as extravascular fluid is remobilized into the vascular compartment
Postpartum, cont…

- Takes up to 6 weeks to stabilize the cardiovascular system
- Elevate HOB, lie on side
- BR with BRP, ADL with Assist
- Progressive ambulation; VS, resp before and after
- Mom to DIRECT OTHER family members in care of infant

ENDOCRINE

- Serious in pregnancy because enzymes or hormones control so many specific body functions

- Hyperthyroid– 2/1000 Graves Disease (most frequent)
  * increased BMR, SNS activity
  * seen more than hypothyroid
  * may see heart failure

- Patient more prone to PIH, IUGR, PTL, and anomalies, **Hyperemesis
- Should be screened, dx, and treated during pregnancy
- Nsg Diagnosis: risk for injury (mat. And fetal) r/t pre-existing thyroid disorder and drug therapy during pregnancy
- Treatment: Not the Usual!
Thyrotoxicosis

- Untreated or partially treated
- S/S: fever, restlessness, tachycardia, vomiting, hypotension, stupor
- Treatment: IV fluids, oxygen, high dose PTU, Potassium Iodide, sedation, antipyretics, steroids, beta blockers

Hypothyroid

- Rare, infertile, frequent miscarriages
- Characteristic symptoms:
- Lab/Diagnostics
- Untreated risks PIH, abruption, stillbirth, low birth weight
- Treatment: thyroid hormone supplement (synthroid)

METABOLIC DISORDERS

DIABETES MELLITUS
- A chronic, systemic disease, characterized by either a deficiency of insulin or decreased ability of body to use insulin
- TYPE I – destruction of beta cells leads to absolute insulin deficiency;
- Inherited trait, HLA, autoimmune
- TYPE II
  - limited beta cell response to hyperglycemia
  - resistance to insulin in liver and peripheral tissues

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In Normal Pregnancy, CHO metabolism changes
- More resistance to cellular action of insulin, less glucose entry into cells, lowers blood glucose up to 50%
- Probably due to hormone changes (HPL, GH, cortisol) counter regulate
- Estrogen, progesterone, prolactin (worsen insulin sensitivity)

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Physiology of Pregnancy that affects Diabetes:
- Vomiting during pregnancy, decreases CHO intake, increases acidosis
- Human placental lactogen decreases insulin response, more needed
- Elevated basal metabolic rate
- Normal lowered renal glucose threshold - spill more
- Muscular activity in labor – adj. insulin
- Postpartum - insulin antagonists removed
How Diabetes affects Pregnancy:

- Significant health risks
- Increased fetal morbidity/mortality
- Risk determined by:
  - degree of glycemic control
  - presence of cardiovascular or renal complications
  - hypertension, smoking, etc.

Gestational Diabetes

- Seen in pregnancy
- At risk for gestational diabetes if:
  - markedly obese
  - personal history of GDM
  - family history of DM
  - glycosuria

Screening for GDM

- 24-28 weeks One Hour Glucose Tolerance (50g Glucose)
  - $\geq 140$ is positive;
  - then 3-hour fasting GTT, 100g glucose
Positive if 2 or more met or exceeded:
  - fasting $>105$, 1hr 190, 2hr 165, 3hr 145mg/dl
So WHAT??!!* About Diabetes in Pregnancy??

- Increased spontaneous abortions
- Increased PIH, PTL, PROM, PP hemorrhage, infections, UTI, ketoacidosis, coma, death (maternal & fetal), anomalies, macrosomia, delivery risks, hypoglycemia, polycythemia, IUGR, RDS, Hyperbili...

Nursing Management - Diabetes

- Assessment
  - Health status
  - Adherence/compliance
  - Understanding
  - Physical Exam – special efforts to ID effects of diabetes
  - Lab

Nursing diagnoses

- Knowledge deficit r/t lack of recall of information
- Risk for fetal injury r/t elevated maternal glucose levels
- Anxiety r/t threat of maternal and fetal well-being
PLAN

- Weekly – biweekly appointments
- Euglycemia = 60-120 mg/dl
- Consistent daily schedule
- Usual supplies, medic alert, foot care
- DIET – precipitates special nutritional needs
  - 3 meals plus 2 snacks
  - consistent weight gain

Insulin Therapy

- Will see increased requirements 2-3rd trimesters with increased insulin resistance
- Type II moms may need to learn to self administer insulin
- 2-3 injections per day
- Insulin pump

Blood Glucose Monitoring

- Immediately report levels < 60, > 200
- Hypoglycemia treated with oral intake of simple carbs 10-20g
- Family (not just the patient) must know symptoms to recognize
- Urine testing w/1st morning urine for ketones
Plan/Surveillance/Interventions

- Fetal assessment
- Determination of delivery date and mode
- Intrapartum
- Postpartum
- Care of Newborn

ANEMIA

- Most common disorder of pregnancy
- Oxygen carrying capacity reduction causes cardiac compensation by increasing CO, cardiac workload and taxing ventricular functioning

Pregnant Hct <34%; Hbg <11mg/dl

Types of Anemia

- Iron Deficiency
  - pathologic
- Folic Acid Deficiency
  - neural tube defects
- Sickle Cell Hemoglobinopathy
  - presence of abnormal hemoglobin
  - pregnancy worsens disease
**Iron Deficiency**
- Iron is needed for erythropoiesis
- Deficiency occurs with blood loss, decreased intake, impaired absorption, excess demands

**Folic Acid Deficiency**
- Needed for RBC production
- Increased nutritional requirements for fetus and placenta
- During conception & early pregnancy deficiencies lead to neural tube defects, cleft lip & palate
- 600 micrograms per day; if deficient may need 1gm/day. Start supplements pre-pregnancy

**Sickle Cell Hemoglobinopathy**
- Trait in 10% of patients, sickling of cells but normal RBC life span
- Anemia in 1% of patients; hemolytic anemia, abnormal hemoglobin
- Recurrent attacks (crises) of fever, pain in abdomen or extremities starting in childhood – vascular occlusion results in tissue hypoxia, edema, RBC destruction
Pre-conception
- Genetic counseling
- Fetal loss is high
- Increased number of crises seen with pregnancy
- Pregnancy worsens the disease – impaired oxygen supply, sickling, infarcts in placental circulation.
- Mom is prone to pyelonephritis, leg ulcers, CVA, CHF, cardiomyopathy, PIH.

RESPIRATORY
- ASTHMA
  - reactive airway disease
  - nursing management specific to disease
  - in addition to OB care
  - classic signs and symptoms
  - therapy – relief of acute attack
    - limit future attacks
    - adequate mat/fetal oxygen

Neuro - Epilepsy
- Disorder of brain causing recurrent seizures
- Most common neuro disorder accompanying pregnancy
- Seizures may be more frequent or more severe in pregnancy
- Hormones affect the seizure threshold
- Anticonvulsants - increase hepatic estrogen metabolism and thus a higher rate of both breakthrough bleeding and contraceptive failure
  - Bleeding is the only consistent association with maternal epilepsy
  - Fetus has enough reserve to withstand an isolated seizure

Medication Therapy is Critical!
- Anticonvulsant metabolism is altered during pregnancy for each drug.
- To maintain blood levels for seizure control, monthly blood levels needed
- Teratogenic! Associated with neural tube, cleft lip/palate, heart, digital hyoplasia depending on which drug

AUTOIMMUNE
- Systemic lupus erythematous (SLE)
  - chronic multisystem inflammatory disease
  - Symptoms fatigue, fever, rash, weight loss, arthralgias, pericarditis
  - Pregnancy implications = 15-60% exacerbation, PTL, IUGR, HELLP/PIH
  - At a minimum need steroids, ASA
HIV/ AIDS

- Women are fastest growing population
- Preconception counseling – pregnancy not encouraged
- 20-25% perinatal transmission with no intervention, ranges from 5-10% with AZT therapy
- 90% of pediatric AIDS cases occur due to perinatal transmission

Management

- Diligence with AZT treatment during pregnancy and infant for 6 weeks
- AZT infusion during labor
- C/Section decreases risk of transmission at delivery
- OB risks include PTL, PROM, IUGR, perinatal mortality and endometritis
- Leave membranes intact, no scalp electrode. Bathe infant ASAP
- Breastfeeding discouraged

Substance Abuse

- Care is often delayed by patient
- Arkansas Cares program
- Standardize care, nsg management to avoid manipulation
- Breastfeeding is contraindicated
- Social work consult mandatory, legal reporting to protect infant