MAXIMIZING PREVENTION: TARGETED CARE FOR THOSE WITH HIGH RISK CONDITIONS

THE NATIONAL PRECONCEPTION CURRICULUM & RESOURCE GUIDE FOR CLINICIANS

MODULE # 3

2nd Review Date: November 8, 2018.
Credits will be available until November 8, 2020.
Module 3 - CME provided by Albert Einstein College of Medicine, New York

Preconception Health+Health Care Initiative
A National Public-Private Partnership

FACULTY & DISCLOSURES

Faculty

- Merry-K Moos, BSN, (FNP-inactive) MPH, FAAN Professor of Obstetrics & Gynecology (retired) and Consultant, Center for Maternal and Infant Health, UNC School of Medicine, Chapel Hill, NC;
- Peter Bernstein, MD, MPH, FACOG Professor of Clinical Obstetrics & Gynecology and Women's Health, Albert Einstein College of Medicine, Bronx, NY

Disclosures

- **Reviewed and Approved by: Peter S. Bernstein, MD, MPH** (Content Validation), Professor of Obstetrics & Gynecology and Women's Health , Program Director for Maternal Fetal Medicine, Albert Einstein College of Medicine, Bronx NY
- **Victor B. Hatcher, PH.D** (CME Reviewer), Associate Dean and Director for CME, Professor of Medicine and Biochemistry, Albert Einstein College of Medicine
- **Reviewers' Disclosures:** Peter Bernstein, MD, MPH has no conflict of interest, Victor Hatcher, Ph.D has no conflict of interest
- Dr. Bernstein and Ms. Moos present no conflict of interest. They will not present any off-label or investigational uses of drugs/devices in this activity.

TARGET AUDIENCE

- Clinicians, including physicians, nurse midwives, nurse practitioners and physician assistants, who provide primary and reproductive health care.

Preconception Health+Health Care Initiative
A National Public-Private Partnership

ACCREDITATION AND CREDIT DESIGNATION STATEMENTS

- **Accreditation Statement**—This activity has been planned and implemented in accordance with the requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of **Albert Einstein College of Medicine** and the **University of North Carolina Center for Maternal & Infant Health**. **Albert Einstein College of Medicine** is accredited by the ACCME to provide continuing medical education for physicians.
- **Credit Designation Statement** –Albert Einstein College of Medicine designates this Internet enduring material for a maximum of 1.0 AMA PRA Category 1 Credit™. Physicians should claim only credit commensurate with the extent of their participation in the activity.

TO FULLY BENEFIT FROM THIS CME OPPORTUNITY FOLLOW THESE SIMPLE STEPS:

- Download file to PC (this will allow you to review content as you have time);
- You will need to view the power point presentation in slide show mode for the features and links to work;
- Where they appear, use the arrows at the bottom of slides to advance through the content;
- At the conclusion of the content there will be instructions and a link for obtaining your Category 1 CME.

Preconception Health+Health Care Initiative
A National Public-Private Partnership

REVIEW OF KEY INFORMATION FROM MODULE 1

Review of **Key Information** from *Module 1*

Preconconception Care: What It Is and What It Isnt

Preconception
Health+Health Care Initiative
A National Public-Private Partnership

In April, 2006 the CDC and the Select Panel released *Recommendations to Improve Preconception Health and Health Care—United States* The recommendations were based on:

- Review of published research
- CDC/ASTDR Work group representing 22 CDC programs
- Presentations at the National Summit on Preconception Care, 2005
- Proceedings of the Select Panel on Preconception Care, 2005

Click here to access full report.

Preconception Health+Health Care Initiative
A National Public-Private Partnership

SUMMARY OF CDC/SELECT PANEL'S TEN RECOMMENDATIONS TO IMPROVE PRECONCEPTION HEALTH AND HEALTH CARE

Consumer

- Individual responsibility across the lifespan
- Consumer awareness

Clinical

- Preventive visits
- Interventions for identified risks
- Interconception care
- Prepregnancy checkup

Financing

- Health insurance coverage for women with low incomes

Public health Programs and Strategies Research

- Surveillance of impact
- Increase evidence base

Preconception Health+Health Care Initiative
A National Public-Private Partnership

THE FOCUS OF THIS MODULE WILL BE RECOMMENDATIONS 3 & 4:

Recommendation #3

"As a part of primary care visits, provide risk assessment and educational and health promotion counseling to all women of childbearing age to reduce reproductive risks and improve pregnancy outcomes."

Recommendation #4

"Increase the proportion of women who receive interventions as follow-up to preconception risk screening, focusing on high priority interventions."

OBJECTIVES

After participating in this activity you should be able to:

- Explain the rationale targeting preconception health promotion to women with high risk conditions
- Link major threats to womens health with major threats to pregnancy outcomes
- Provide examples of medical conditions and their potential impacts on pregnancy outcome
- Begin to develop strategies to view every encounter with a woman of childbearing age as an opportunity for health promotion and disease prevention through the life cycle.

THE RATIONALE FOR TARGETING PRECONCEPTION HEALTH ACTIVITIES TO WOMEN WITH HIGH RISK CONDITIONS

WHAT ARE "HIGH RISK" CONDITIONS?

- In this module, high risk conditions are defined as preexisting medical diseases which could result in compromised health for the woman, the fetus or the offspring should pregnancy occur.
- In subsequent modules, other definitions of high risk conditions, such as previous poor pregnancy outcome, will be explored.

THE RATIONALE FOR TARGETING PRECONCEPTION CARE TO WOMEN WITH HIGH RISK CONDITIONS

- Nearly 50% of pregnancies are conceived without intent
- Even when pregnancy is intended, women may not have discussed their desire or plans to conceive with their medical provider
- Women with high risk conditions frequently have contact with medical providers
- Medical providers often overlook the ramifications of pregnancy as they address a woman's chronic disease needs
- Therefore overlooked opportunities may exist to reach women with important information on high risk conditions and their potential impact on maternal, fetal or newborn health

THE ROLE OF THE CLINICIAN IN PRECONCEPTION CARE

Consider every visit as an opportunity to address preconception needs to:

- Prevent unwanted/unintended pregnancies
- Provide preconception counseling, if pregnancy is desired or likely
- Encourage women/couples to actively choose when and when not to become pregnant
- Provide general health promotion and disease prevention guidance

MODULE OVERVIEW

In this module we will examine preconception considerations for women with:

- Epilepsy
- Diabetes Mellitus
- Chronic Hypertension
- HIV Infection
- Obesity
- Depression

This is not meant to be an exhaustive list of conditions, but only examples to demonstrate some of the principles of preconception care.

CASE STUDY: SEIZURE DISORDERS

- A 22 yo woman has missed her period.
- Her pregnancy test in the office is “negative”
- She expresses a desire to have a baby
- She has been taking Dilantin since the age of 2
- She has not had any seizures during the past 5 years

PRECONCEPTION CARE AND SEIZURE DISORDER

- Epilepsy is the most common, serious neurologic problem seen in pregnancy
- There is an increased incidence of congenital malformations in infants of mothers with seizure disorders
- The prepregnancy period is the ideal time for maternal evaluation

PRECONCEPTION CARE GOALS: EPILEPSY

- Implications for the woman if she conceives (click here)
- Implications for the pregnancy outcome if she conceives (click here)
- Medication considerations (click here)
- Family planning needs (click here)
- Looking beyond the disease to the whole woman (click here)

Next

Preconception Health+Health Care Initiative
A National Public-Private Partnership

EPILEPSY:
IMPLICATIONS FOR THE WOMAN IF SHE CONCEIVES

- Goal is to keep woman seizure-free
- Approximately 90 % of women who have been without seizures for the 9 months prior to pregnancy will remain seizure free in pregnancy
- It is generally recommended that patients who enter pregnancy on an anticonvulsant continue it throughout the gestation
- Abrupt discontinuation of medications may precipitate seizures even among women who no longer require the medication

Back

EPILEPSY:
IMPLICATIONS FOR PREGNANCY OUTCOMES

Offspring of women with epilepsy have a risk of congenital anomalies 2-3x greater than the general population and may have higher risk of developing epilepsy themselves

Goals are to:

- Decrease the incidence of congenital abnormalities in the infant
- Reduce fetal exposure to maternal convulsions
- Reduce fetal exposure to anticonvulsant drugs

MALFORMATIONS IN THE OFFSPRING OF WOMEN WITH EPILEPSY

- Anticonvulsants may have teratogenic risk, particularly valproate
  - Valproate therapy should be avoided during organogenesis whenever possible
  - Common anomalies are midline defects such as NTDs and cleft lip/palate and cardiac abnormalities
- The best regimen is the one that best prevents seizures at the lowest dose and, whenever possible, relies on monotherapy

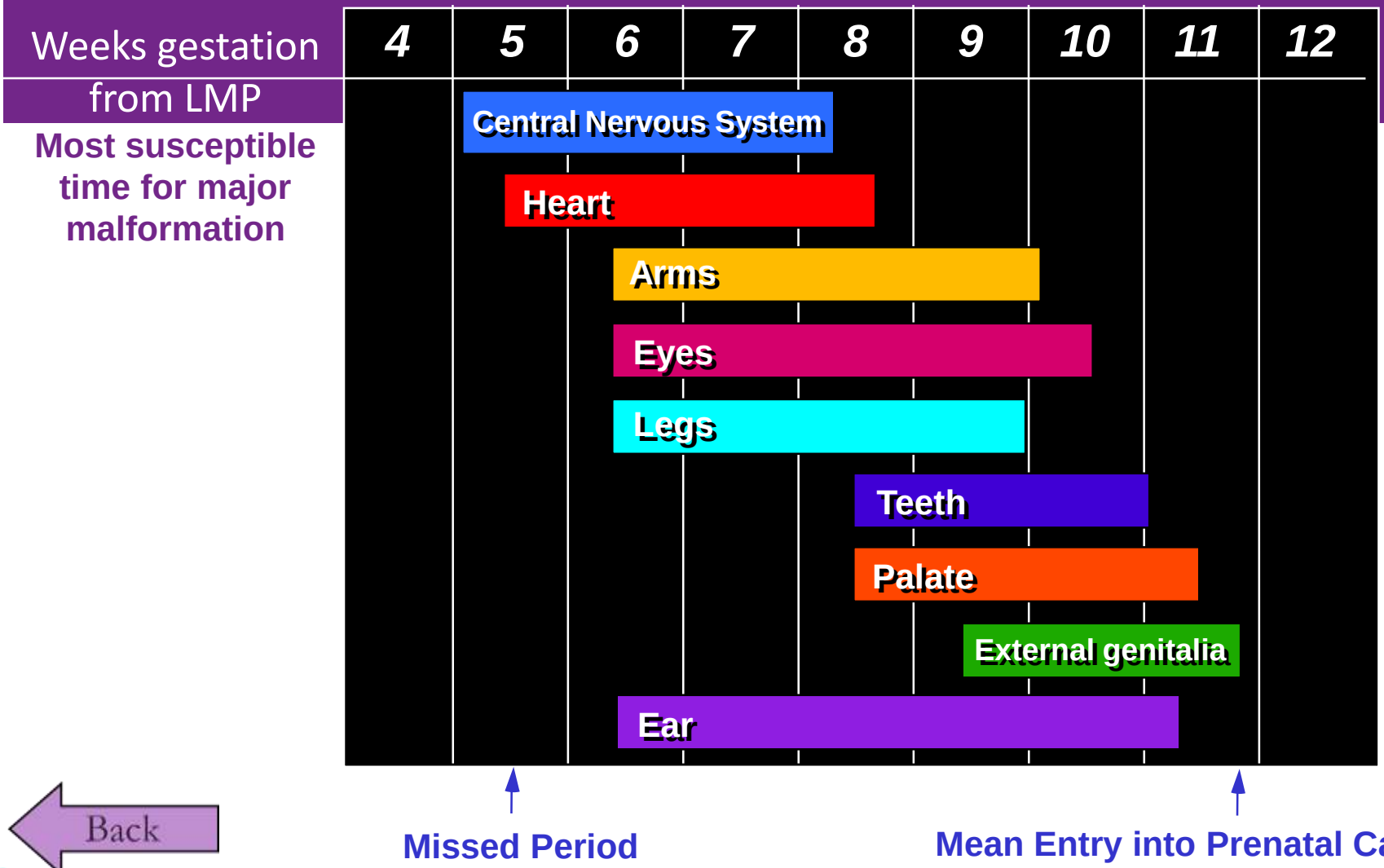
Back

EPILEPSY: MEDICATIONS

- Increased risk (2-3x) of both major and minor malformations in pregnancies exposed to one of the major anticonvulsants:
  - Phenytoin, carbamazepine, valproate
  - Valproate probably poses the greatest risk
  - Harm has generally already occurred before prenatal care begun
- Exposure to medications may have long term impact on offspring's cognitive and neurologic function
  - One study found children exposed to valproate in utero had significantly worse IQ scores at age 3 (6-9 points lower than those exposed to other anticonvulsants)
- Limited information exists on newer anticonvulsants
- Drug dosages may need to be changed to maintain serum levels in the therapeutic range during pregnancy

Back

Critical Periods of Development



Most susceptible time for major malformation

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

EPILEPSY:
FAMILY PLANNING NEEDS

- A reproductive life plan should be encouraged
- Appropriate contraceptive counseling in the woman not desiring pregnancy should include consideration of drug interactions with contraceptives
- The effectiveness of hormonal contraception is decreased in women taking anticonvulsants
  - Many anticonvulsants induce the hepatic cytochrome P450 system
  - Women using liver enzyme inducing anticonvulsants have at least a 4x greater risk of oral contraceptive failure than women not taking these drugs

Back

LOOKING AT AND BEYOND THE DISEASE. . .

- Every woman with a chronic disease should be aware of the potential effects of her disease and its treatments on herself, her pregnancy and her offspring, should she conceive, as well as the opportunities for maximizing a healthy outcome
- All women of childbearing age should be taking a multivitamin that includes folic acid every day
- All women/couples should be encouraged to develop a reproductive life plan
- All women should be routinely assessed and counseled about BMI, exercise, tobacco and alcohol use, other exposures and immunization status (see module 2)

PRECONCEPTION CARE FOR THE WOMAN WITH A SEIZURE DISORDER

- Underscore the importance of actively planning for any conceptions
- Instruct woman to start folic acid at least 0.4 mg (many recommend 1.0 or 4.0 mg) one month before desired conception and to continue this dose through the first trimester
- Evaluate the maternal condition and assess the plan for treatment--engage both obstetrical provider and neurologist or internist in preconception care of the woman
  - Wean from anticonvulsants if possible
  - Utilize monotherapy if medication is needed
  - The first prenatal visit is too late to adjust treatment regimen since organogenesis will be well underway (click here)
- Counsel the woman about the need to adhere to the treatment plan and not to suddenly stop medications

WHO IS AN OPTIMAL CANDIDATE FOR WITHDRAWAL OF ANTICONVULSANTS?

- No seizure in 2-4 years or longer on medications
- Normal CT Scan of brain
- EEG normalized
- Absence of cerebral dysfunction

EPILEPSY: PRIMARY CARE V. PRECONCEPTION CARE

Shared Elements:

- exploration of original diagnosis & workup
- drug regimen
- appropriateness of trial of withdrawal
- education

Unique aspects:

- waiting period before conception
- consideration of changing medication regimen to avoid valproate
- early prenatal care plan
- folic acid supplementation

A Review of the Evidence Follows:

(as published in: Evidence-based Recommendations from the Clinical Workgroup of the CDC Select Panel on Preconception Care. American Journal of Obstetrics & Gynecology, 2008;199:S266-279; S310-327.)

Preconception Health+Health Care Initiative
A National Public-Private Partnership

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH SEIZURE DISORDERS

Women of reproductive age with seizure disorders should be counseled about the risks of increased seizure frequency in pregnancy, the potential effects of seizures and anticonvulsant medications on pregnancy outcomes and the need to plan their pregnancies with a healthcare provider in advance of a planned conception.

Strength of evidence: A Quality of evidence: II-2

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH SEIZURE DISORDERS

Women who take liver enzyme-inducing anticonvulsants should be counseled about the increased risk of hormone contraceptive failure.

Strength of evidence: A Quality of evidence: II-2

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH SEIZURE DISORDERS

Whenever possible, women of reproductive age should be placed on anticonvulsant monotherapy with the lowest effective dose to control seizures; women who are planning a pregnancy should be fully evaluated for consideration of alteration or withdrawal of the anticonvulsant regimen before conception

Strength of evidence: A Quality of evidence: II-2

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH SEIZURE DISORDERS

Women who are planning a pregnancy should begin folic acid supplementation of at least 0.4 mg (some recommend 1 or 4 mg) per day starting 1 month before desired conception and continued through the end of the first trimester to prevent neural **tube defects.**

Strength of evidence: A Quality of evidence: II-2

CASE STUDY: DIABETES

- 38 yo college professor with Type 2 diabetes for 13 years. Deferred childbearing, now wants to conceive
- Background retinopathy on exam 1 yr ago
- EKG: T inversions in 1, L, V6; no history of angina but notes mildly decreased exercise tolerance
- Microalbuminuria noted 3 yrs ago; creatinine 1.1
- On ACE inhibitor

PRECONCEPTION CARE GOALS: DIABETES

- Implications for the woman if she conceives (click here)
- Implications for the pregnancy outcome if she conceives (click here)
- Medication considerations (click here)
- Family planning needs (click here)
- Looking beyond the disease to the whole woman (click here)

DIABETES:
IMPLICATIONS FOR THE WOMAN IF SHE CONCEIVES

- Presence of vasculopathy, hypertension, or poor glycemic control are risk factors for the development of preeclampsia
- Progression of pre-existing nephropathy is possible during pregnancy
- Progression of retinopathy is often accelerated in pregnancy, threatening vision. Prior laser therapy is protective.
- Increased risk of urinary tract infection (which is a risk factor for preterm birth and diabetic ketoacidosis).

Next

CARE FOR DIABETIC WOMEN IN PREPARATION FOR PLANNED CONCEPTION

- Seek evidence of coronary artery disease (CAD) or cardiomyopathy through thorough history and physical exam (consider EKG in patients with longstanding diabetes).
- Individualize further workup based on findings of above plus age, duration of disease, family history, lipid profile, etc.
- CAD, if detected, poses a 5-15% risk of maternal mortality

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

DIABETES: IMPLICATIONS FOR PREGNANCY OUTCOMES

- Increased incidence of congenital anomalies (click here) related to glycemic control
- Increased risk of fetal growth disturbances
  - Macrosomia
  - Intrauterine fetal growth restriction
- Increased risk of intrauterine fetal demise
  - Can be mitigated by optimal glycemic control
- Increased risk of preterm birth
  - Both spontaneous and indicated

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

HEMOGLOBIN A1C & CONGENITAL ANOMALIES

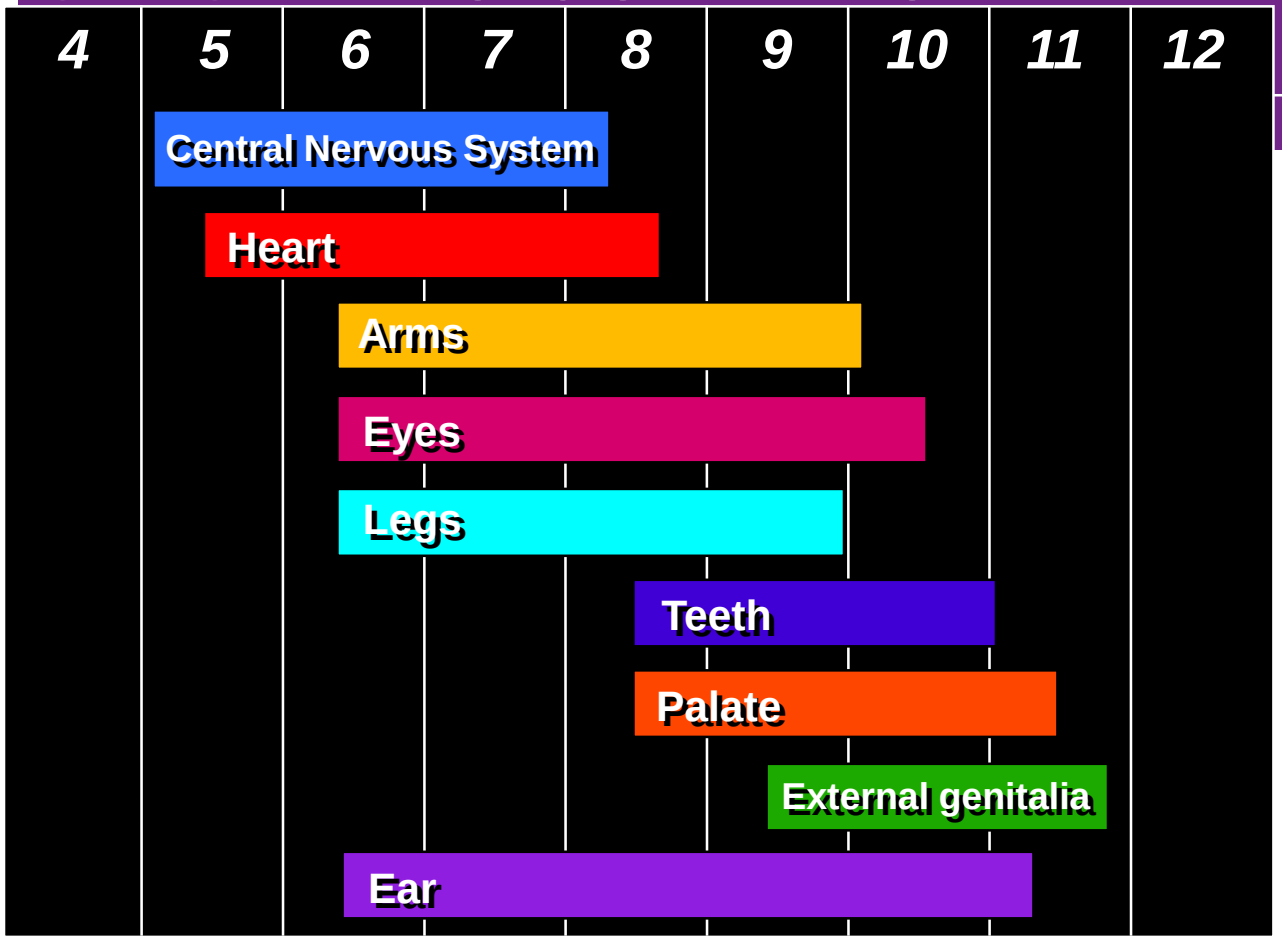
For each 1 standard deviation unit increase in Hgb A1c above normal (5.5 percent), the odds ratio of congenital anomalies increases by 1.2 (95% CI 1.1-1.4)

Guerin, Diabetes Care 2007

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

CRITICAL PERIODS OF DEVELOPMENT



Weeks gestation from LMP

Most susceptible time for major malformation

Preconception Health+Health Care Initiative
A National Public-Private Partnership

CONGENITAL ANOMALIES IN DM AND GESTATIONAL AGE

Caudal regression	5 weeks
Situs inversus	6 weeks
Spina bifida	6 weeks
Anencephaly	6 weeks
Heart anomalies	7-8 weeks
Anal/rectal atresia	8 weeks
Renal anomalies	7 weeks

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

9 weeks gestational age by LMP
(7 weeks after conception)

DIABETES: MEDICATIONS

- Limited data exists on oral hypoglycemics and pregnancy. Metformin and glyburide are the most well studied (click here for more information on oral hypoglycemic medications)
- Statins: Limited data on safety but theoretic concerns because of the role of cholesterol in embryonic development
- ACE inhibitors: often prescribed to limit progression of nephropathy, should be discontinued prior to conception because they are associated with fetal anomalies (cardiovascular, CNS, and renal)

DIABETES: MEDICATIONS

- The American Diabetes Association recommends insulin for glycemic control in type 1 and type 2 diabetes because the safety of oral anti-hyperglycemic agents has not been assured during early pregnancy.
- The American College of Obstetricians and Gynecologists also recommends insulin and states use of oral agents for control of type 2 diabetes mellitus during pregnancy should be limited and individualized until more data confirming safety and efficacy become available

Next

DIABETES: MEDICATIONS

Oral Hypoglycemics:

- First generation sulfonylureas cross the placenta and can cause fetal hyperinsulinemia
- No harmful effects noted in early or late pregnancy from glyburide
  - Limited passage of glyburide across the placenta
- No evidence of increased risk of major malformations with use of metformin in the first trimester
- Only sparse data about other oral hypoglycemics
- Some express concern that optimal pregestational control can only be achieved with insulin

Back

DIABETES: FAMILY PLANNING NEEDS

- A reproductive life plan should be encouraged
- No specific contraindications to any contraceptive method in women with diabetes who do not have end-organ dysfunction
- Women with evidence of vascular disease or other end-organ dysfunction should avoid estrogen containing contraceptives
- Other hormone containing contraceptives may also present risks
- Women with diabetes should take into consideration the likely progression of their disease when choosing when to conceive

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

LOOKING AT AND BEYOND THE DISEASE. . .

- Every woman with a chronic disease should be aware of the potential effects of her disease and its treatments on herself, her pregnancy and her offspring, should she conceive, as well as opportunities for maximizing a healthy outcome
- All women of childbearing age should be taking a multivitamin that includes folic acid every day
- All women/couples should be encouraged to develop a reproductive life plan
- All women should be routinely assessed and counseled about BMI, exercise, tobacco and alcohol use, other exposures and immunizations status (see module 2)

PRECONCEPTION CARE FOR WOMEN WITH DIABETES

- Work with woman/couple to prevent unintended or unplanned pregnancies
- Discuss consequences of delayed childbearing
- Educate about increased risks of congenital anomalies and the dramatic benefits of tight glucose control; educate about other risks to both mother and fetus
- Educate the woman/couple about the demanding prenatal regimen used to identify any risks to maternal or fetal health as early as possible.
- Engage both obstetrical provider and endocrinologist or other provider of diabetes care in coordinated preconception care of the woman

CARE FOR DIABETIC WOMEN IN PREPARATION FOR PLANNED CONCEPTION

- Consider substituting insulin (either multi-dose regimen or insulin pump) for oral hypoglycemics
- Adjust medication regimen to achieve optimal glycemia for embryonic development (click here)
- Goals: Normal Hgb A1c level; fasting blood sugar = 60-90 mg/dl; 1 hr postprandial <140mg/dl; 2 hr <120
- Goals achieved by home monitoring, multiple daily injections, close supervision, education
- Counsel to postpone conception until optimal control is achieved and stable

Next

HEMOGLOBIN A1C & CONGENITAL ANOMALIES

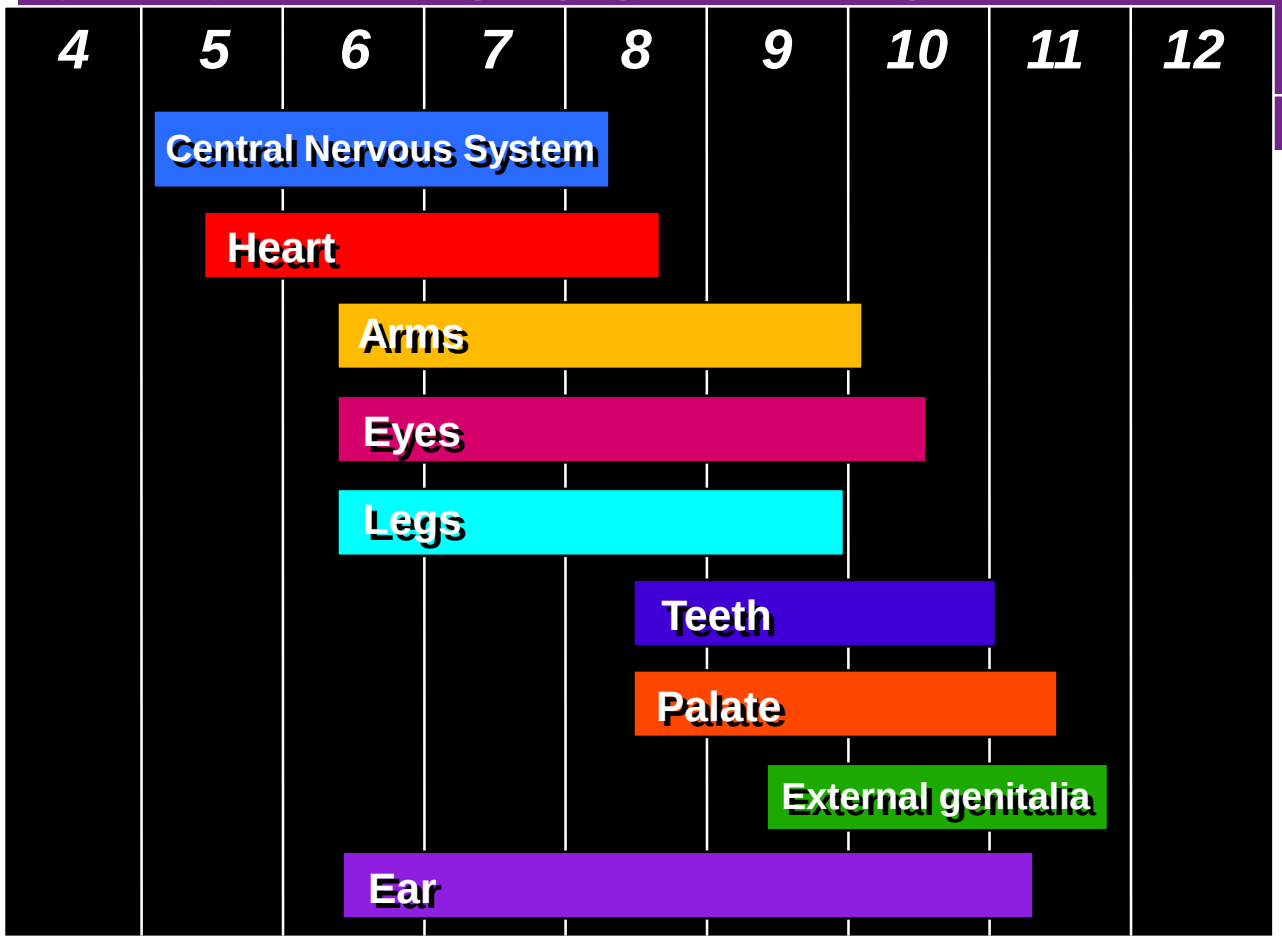
For each 1 standard deviation unit increase in Hgb A1c above normal (5.5 percent), the odds ratio of congenital anomalies increases by 1.2 (95% CI 1.1-1.4)

Guerin, Diabetes Care 2007

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

CRITICAL PERIODS OF DEVELOPMENT



Weeks gestation from LMP

Most susceptible time for major malformation

Preconception Health+Health Care Initiative
A National Public-Private Partnership

CONGENITAL ANOMALIES IN DM & GESTATIONAL AGE

Caudal regression	5 weeks
Situs inversus	6 weeks
Spina bifida	6 weeks
Anencephaly	6 weeks
Heart anomalies	7-8 weeks
Anal/rectal atresia	8 weeks
Renal anomalies	7 weeks

9 weeks gestational age by LMP
(7 weeks after conception)

Preconception
Health+Health Care Initiative
A National Public-Private Partnership

CARE FOR DIABETIC WOMEN IN PREPARATION FOR PLANNED CONCEPTION

- In women with long-standing diabetes screen for:
  - proliferative retinopathy
    - retinopathy may progress during pregnancy
  - nephropathy (creatinine & protein excretion)
    - the presence of nephropathy increases maternal and fetal risks
  - coronary artery disease (CAD)
    - patients with CAD may better tolerate pregnancy after revascularization
  - urinary tract infections

DIABETES: PRIMARY CARE V. PRECONCEPTION CARE

Shared Elements:

- Surveillance of glycemic control and end organ damage: retina, kidney, vasculature, nervous system, heart
- Manage medication regimen
- Educate regarding diet, exercise, weight control, smoking
- Attention to lipids, hypertension, microalbuminuria, infection and its prevention

DIABETES:
PRIMARY CARE V. PRECONCEPTION CARE (CONT.)

Unique aspects:

- Potential conversion to insulin prior to conception
- Early prenatal care plan
- Folic acid supplementation
- Excellent preconception glycemic control (goal of Hgb A1c < 6 %) can reduce the risk of congenital anomalies (click here)
- Commonly used drugs for lipid disorders, nephropathy are not safe during pregnancy and may need to be stopped or changed.

PREVENTION OF CONGENITAL MALFORMATIONS

Meta-analysis of 14 cohort studies:

- Incidence of major anomalies in women with preconception care was approximately 1/3 the incidence of those without preconception care (2.1% v. 6.5%, RR 0.36)

Ray et al. 1994

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

A Review of the Evidence Follows:

(as published in: Evidence-based Recommendations from the Clinical Workgroup of the CDC Select Panel on Preconception Care. American Journal of Obstetrics & Gynecology, 2008;199:S266-279; S280-289.)

Preconception Health+Health Care Initiative
A National Public-Private Partnership

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH DIABETES MELLITUS

All women with diabetes mellitus should be counseled about the importance of diabetes mellitus control before considering pregnancy. Important counseling topics include achieving optimal weight, maximizing diabetes control, self glucose monitoring, a regular exercise program and tobacco, alcohol and illicit drug-use cessation along with social support to assist during pregnancy.

Strength of evidence: A Quality of evidence: I

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH DIABETES MELLITUS

In the months before pregnancy, women with diabetes mellitus should demonstrate as near-normal glycosylated hemoglobin levels as possible (while avoiding hypoglycemia) for the purpose of decreasing the rate of congenital anomalies. Women with poor control should be encouraged to use effective birth control.

Strength of evidence: A Quality of evidence: I

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH DIABETES MELLITUS

Testing to detect prediabetes and type 2 diabetes in asymptomatic women should be considered in adults who are overweight or obese and who have 1 or more additional risk factors for diabetes, including a history of gestational diabetes mellitus.

Strength of evidence: B **Quality of evidence: II-2**

CASE STUDY: CHRONIC HYPERTENSION

- 32 yo social worker who was diagnosed with chronic hypertension 3 years ago
- Presents for an annual visit, not currently taking any medications
- BP at visit is 160/100
- Does not desire a pregnancy in the near future but is getting married in 2 months

BACKGROUND: CHRONIC HYPERTENSION (CHTN)

- Approximately 2-12.6% of women of childbearing age have CHTN
- 10-15% of pregnancies in the US are complicated by hypertensive disorders (i.e. CHTN, preeclampsia, gestational hypertension)
- Rates of pregestational hypertension complicating pregnancy are increasing (from 12.3 per 1000 deliveries in 1993 to 28.9 per 1000 deliveries in 2002)

PRECONCEPTION CARE GOALS: CHRONIC HYPERTENSION

- Implications for the woman if she conceives (click here)
- Implications for pregnancy outcome if she conceives (click here)
- Medication considerations (click here)
- Family planning needs (click here)
- Looking beyond the disease to the whole woman (click here)

Next

Preconception Health+Health Care Initiative
A National Public-Private Partnership

HYPERTENSION: IMPLICATIONS FOR THE WOMAN IF SHE CONCEIVES

- Goal is to maintain good BP control on least medication
- High risk for the development of preeclampsia/eclampsia particularly in women with severe HTN or vascular disease
- Risk exists for progression of renal disease if woman already has chronic renal insufficiency

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

HYPERTENSION: IMPLICATIONS FOR PREGNANCY OUTCOMES

Complications in pregnancy:

- Spontaneous abortion
- Pre-eclampsia
- Fetal growth restriction
- Abruptio placentae
- Preterm birth (both spontaneous and indicated)

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

HYPERTENSION: MEDICATIONS

Some examples:

- Methyldopa-most widely studied, but of limited effectiveness
- Labetalol-most widely used, may be associated with intrauterine growth restriction
- Nifedipine-less well studied but appears safe
- Hydralazine-probably safe but difficult to obtain oral formulation
- Thiazide diuretics-controversial but can be continued if volume depletion avoided
- ACE Inhibitors and angiotensin receptor blockers-contraindicated because teratogenicity risk

Back

HYPERTENSION: FAMILY PLANNING NEEDS

- A reproductive life plan should be encouraged
- Women/couples need to be aware of potential for progression of disease when choosing the optimal time to conceive
- Estrogen containing contraceptives are not recommended (may increase BP and increase risk of cardiovascular events)
- Progestin only methods are probably safe
- Women taking potentially teratogenic drugs (e.g. ACE inhibitors) should be counseled about importance of using effective contraception

Back

LOOKING AT AND BEYOND THE DISEASE. . .

- Every woman with a chronic disease should be aware of the potential effects of her disease and its treatments on herself, her pregnancy and her offspring, should she conceive, as well as opportunities for maximizing a healthy outcome
- All women of childbearing age should be taking a multivitamin that includes folic acid every day
- All women/couples should be encouraged to develop a reproductive life plan
- All women should be routinely assessed and counseled about BMI, exercise, tobacco and alcohol use, other exposures and immunization status (see module 2)

MANAGEMENT OF PREGESTATIONAL HTN IN PREGNANCY

- No evidence that medical management of mild HTN during pregnancy reduces pregnancy complications
- Severe or complicated HTN is more often associated with poor pregnancy outcomes
- No conclusive data on optimal antihypertensive medication to choose

PRECONCEPTION CARE FOR WOMEN WITH HYPERTENSION

- Work with woman/couple to prevent unintended or unplanned pregnancies
- Discuss consequences of delayed childbearing
- Engage both obstetrical provider and internist or other provider of care for hypertension to coordinate preconception care of the woman
- Stabilize the woman on the simplest medication regimen, avoiding teratogenic medications

HYPERTENSION: PRIMARY CARE V. PRECONCEPTION CARE

Shared elements

- Control of BP via lifestyle and diet modifications and antihypertensive medications
- Goal to prevent cardiovascular complications
- Assess for etiology of CHTN and for evidence of end organ disease (esp. renal dysfunction)
- Want to choose the least aggressive treatment that will achieve the desired BP control

HYPERTENSION: PRIMARY CARE V. PRECONCEPTION CARE (CONT.)

Unique aspects

- Counsel on risk of poor pregnancy outcomes
- If medications required, avoid ACE inhibitors and angiotensin receptor blockers
- Counsel on optimal time to conceive (once BP under control and before the development of end-organ disease)
- Counsel not to suddenly discontinue medication if conceives
- Encourage early entry into prenatal care
- Not clear that medical management of mild CHTN impacts on the outcome of pregnancy

A REVIEW OF EVIDENCE FOLLOWS:

As published in: Evidence-based Recommendations from the Clinical Workgroup of the CDC Select Panel on Preconception Care. American Journal of Obstetrics & Gynecology, 2008;199:S266-279; S310-327.

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH CHRONIC HYPERTENSION

Women of reproductive age with chronic hypertension should be counseled about the risks associated with hypertension during pregnancy for both the woman and her offspring and the possible need to change the antihypertensive regimen when she is planning a pregnancy

Strength of evidence: A Quality of evidence: II-2

Preconception Health+Health Care Initiative
A National Public-Private Partnership

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH CHRONIC HYPERTENSION

Angiotensin-converting enzyme inhibitors and angiotensin-receptor blockers are contraindicated during pregnancy; women who could become pregnant while taking these medications should be counseled about their adverse fetal effects and should be offered contraception if they are not planning a pregnancy. Women who are planning a pregnancy should discontinue these medications, under medical supervision, before pregnancy.

Strength of evidence: A Quality of evidence: II-2

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH CHRONIC HYPERTENSION

Women with hypertension of several years should be assessed for ventricular hypertrophy, retinopathy and renal disease before pregnancy.

Strength of evidence: A Quality of evidence: II-2

Preconception Health+Health Care Initiative
A National Public-Private Partnership

CASE STUDY: HIV INFECTION

- 28 yo teacher presents for routine visit to monitor her HIV infection
- Viral load is undetectable on current regimen
- Has had no opportunistic infections
- Sexually active but using condoms
- Partner is HIV-negative

BACKGROUND: HIV INFECTION

- Perinatal HIV infection accounts for more than 90% of pediatric AIDS cases in the US
  - Many of these cases are born to women who didn't know their HIV status
- Early identification and treatment is optimal method to reduce vertical transmission
- Treatment with antiretrovirals can reduce vertical transmission to ≤ 2%

PRECONCEPTION CARE GOALS: HIV INFECTION

- Implications for the woman if she conceives (click here)
- Implications for the pregnancy outcome if she conceives (click here)
- Medication considerations (click here)
- Family planning needs (click here)
- Looking beyond the disease to the whole woman (click here)

Next

Preconception Health+Health Care Initiative
A National Public-Private Partnership

HIV INFECTION: IMPLICATIONS FOR THE WOMAN IF SHE CONCEIVES

- No evidence of increased risk for HIV infection progression as a result of pregnancy
- A woman not on antiretroviral medication will need to initiate an antiretroviral regimen in order to reduce risk of vertical transmission
- Women with end organ dysfunction (e.g. kidneys, heart) are at risk of worsening organ function and pregnancy complications

Back

HIV INFECTION: IMPLICATIONS FOR PREGNANCY OUTCOMES

- Limited data on impact of medications on pregnancy outcomes
  - To date, most appear to be safe for the pregnancy
- Risk of vertical transmission directly related to viral load
  - Women with viral loads >1000 copies/mL can further reduce risk of vertical transmission through cesarean delivery

Back

HIV INFECTION: MEDICATIONS

- A combination antiretroviral drug regimen should be given antenatally to prevent vertical transmission. It is preferred that zidovudine is one of the active medications in this regimen if there are no contraindications for its use. Other antiretroviral medications are equally as effective in preventing transmission.
- Intrapartum zidovudine may not be necessary for patients with an undetectable viral load in labor
- Infants should receive oral zidovudine for the first six weeks after birth
- Specific medication issues:
  - Efavirenz – should be avoided during the first 6 weeks of pregnancy (potentially teratogenic)
  - Didanosine/Stavudine (ddI/d4T) - associated with the development of lactic acidosis during pregnancy
  - Nevirapine - associated with hepatotoxicity when initiated in individuals with CD4 counts > 250 cells/mm^3
- Many protease inhibitors have decreased serum concentrations during the third trimester so dose adjustments may be necessary
- Most antiretroviral medications have not been adequately studied during pregnancy

It is important to work with a patient's HIV care provider before making changes to the patient's medication regimen

Back

HIV INFECTION: FAMILY PLANNING NEEDS

- Women/couples should be encouraged to develop a reproductive life plan
- Need to be aware of potential drug interactions between oral contraceptives and anti-retrovirals
  - Antiretroviral regimens containing protease inhibitors and non-nucleoside reverse transcriptase inhibitors may decrease levels of steroids released by hormonal contraceptives. Drug interactions of antiretrovirals on hormonal contraceptives are specific to the type of antiretroviral and hormonal contraceptive being utilized.

HIV INFECTION: FAMILY PLANNING NEEDS

- Condoms while most effective at reducing viral transmission during intercourse are not optimal for preventing pregnancy
- Unprotected intercourse for the purpose of conceiving presents a risk to the woman's partner
  - Should consider artificial insemination
- Need to be aware of the potential for progression of co-morbid conditions when choosing the optimal time to conceive (sooner may be better than later)

Back

LOOKING AT AND BEYOND THE DISEASE. . .

- Every woman with a chronic disease should be aware of the potential effects of her disease and its treatments on herself, her pregnancy and her offspring, should she conceive, as well as the opportunities for maximizing a healthy outcome
- All women of childbearing age should take a multivitamin that includes folic acid every day
- All women/couples should be encouraged to develop a reproductive life plan
- Providers should routinely assess and counsel all women about optimal BMI, exercise, tobacco and alcohol use, other exposures, and immunization status (see module 2)

Back

PRECONCEPTION CARE FOR WOMEN WITH HIV INFECTIONS

- Work with woman/couple to explore safest choices for conception
- Discuss potential consequences of delayed childbearing
- Assure that woman has access to appropriate antiretroviral medications and is willing to take them consistently
- Engage both obstetrical provider and HIV specialist to coordinate preconception care of the woman

HIV INFECTION: PRIMARY CARE V. PRECONCEPTION CARE

Shared elements

- Preserve cellular immune function
- Minimize viral load
- Reduce the risk of opportunistic infections
- Determine if other co-morbid conditions exist (e.g. renal disease, cervical dysplasia) and treat
- Limit development of viral mutations and drug resistance
- Reduce the risk of viral transmission

HIV INFECTION: PRIMARY CARE V. PRECONCEPTION CARE (CONT.)

Unique aspects

- Counsel about implications of a pregnancy
- Reassessment of optimal antiretroviral regimen (see Medications)
- Cesarean delivery can reduce vertical transmission in women with a viral load > 1000 copies/mL
- Postpartum maternal morbidity is greater among HIV-infected women who undergo cesarean delivery

HIV INFECTION: MEDICATIONS

- A combination antiretroviral (ARV) drug regimen consisting of three active antiretroviral medications should be given antenatally to prevent vertical transmission.
- In most cases, women who present for obstetric care on a fully suppressive ARV regimen should continue their current regimen
- Intrapartum zidovudine may not be necessary for patients with an undetectable viral load in labor
- Infants should receive oral zidovudine for the first four to six weeks after birth, depending on maternal viral load
- Many protease inhibitors and the pharmacologic booster cobicistat, have decreased serum concentrations during the third trimester, so dose adjustments or medication changes may be necessary
- Most antiretroviral medications have not been adequately studied during pregnancy

It is important to work with a patient's HIV care provider before making changes to the patient's medication regimen

Back

A Review of the Evidence Follows:

(as published in: Evidence-based Recommendations from the Clinical Workgroup of the CDC Select Panel on Preconception Care. American Journal of Obstetrics & Gynecology, 2008;199:S266-279; S296-309.)

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH HIV

All men and women should be encouraged to know their human immunodeficiency virus status before pregnancy and should be counseled about safe sexual practices.

Strength of evidence: A Quality of evidence: I-b

Preconception Health+Health Care Initiative
A National Public-Private Partnership

EVIDENCE-BASED RECOMMENDATIONS ON PRECONCEPTION CARE FOR WOMEN WITH HIV

Women who test positive for HIV must be informed of the risks of vertical transmission to the infant and the associated morbidity and mortality probabilities. These women should be offered contraception. Women who choose pregnancy should be counseled about the availability of treatment to prevent vertical transmission and that treatment should begin before pregnancy.

Strength of evidence: A Quality of evidence: I-b

Preconception Health+Health Care Initiative
A National Public-Private Partnership

CASE STUDY: OBESITY

- 33 yo homemaker with two children presents for management of a missed period
  - Pregnancy test is negative
- Did not lose gestational weight gain after either of her pregnancies
- Last pregnancy complicated by gestational diabetes (diet-controlled)
- Current BMI is 31 kg/m^2

BACKGROUND: OBESITY

- Incidence of obesity rising dramatically in the US
  - From 2001 to 2012, the incidence of obesity among women of reproductive age has risen from 17.6% to 25%
- Associated with subfertility and spontaneous abortions
- Associated with multiple other complications during pregnancy (see slide: Pregnancy complications associated with maternal obesity)

PRECONCEPTION CARE GOALS: OBESITY

- Implications for the woman if she conceives (click here)
- Implications for the pregnancy outcome if she conceives (click here)
- Medication considerations (click here)
- Family planning needs (click here)
- Looking beyond the disease to the whole woman (click here)

OBESITY: IMPLICATIONS FOR THE WOMAN IF SHE CONCEIVES

- Additional weight gain
- Gestational diabetes and subsequent type 2 diabetes mellitus
- Hypertensive Disorders
- Thromboembolic disease
- Obstructive sleep apnea
- Induction of labor
- Cesarean delivery
- Anesthesia complications
- Postpartum hemorrhage
- Postpartum infection
- Wound complications

Back

OBESITY: IMPLICATIONS FOR PREGNANCY OUTCOMES

- Increased risk of spontaneous abortion
- Congenital malformations
  - Neural tube, cardiovascular anomalies
  - Standard doses of preconception folic acid may not be as effective at reducing risk of birth defects
- Macrosomia
- Shoulder dystocia (Erb's Palsy)
- Perinatal mortality
- Childhood obesity

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

OBESITY: MEDICATIONS

Selected Medications in Pregnancy:

Sympathomimetic drugs

- Not adequately studied in pregnancy
- No clear evidence of teratogenicity
- Not recommended during pregnancy

Drugs that alter fat digestion

- No evidence of harm during pregnancy
- May alter absorption of fat soluble vitamins

Back

OBESITY: FAMILY PLANNING NEEDS

- Women/couples should be encouraged to develop a reproductive life plan
- Combined hormonal contraceptives may be less effective in obese women
- Obese women using depot medroxy- progesterone acetate may take longer return to ovulatory function
  - Depo medroxyprogesterone acetate also may be associated with weight gain
- May be more procedural challenges
  - Placing IUD
  - Performing sterilization

Back

LOOKING AT AND BEYOND THE DISEASE. . .

- Every woman with a chronic disease should be aware of the potential effects of her disease and its treatments on herself, her pregnancy and her offspring, should she conceive, as well as the opportunities for maximizing a healthy outcome
- All women of childbearing age should be taking a multivitamin that includes folic acid every day
  - 400 mcg of folic acid may not be sufficient for obese women. Some authorities suggest 1 gm.
- All women/couples should be encouraged to develop a reproductive life plan
- All women should be routinely assessed and counseled about BMI, exercise, tobacco and alcohol use, other exposures and immunization status (see module 2)

OBESITY: PRIMARY CARE V. PRECONCEPTION CARE

Shared elements:

Appropriate weight loss utilizing

- Healthy diet with decreased caloric intake
- Increased physical activity

Weight loss

- Improves fertility
- May reduce long term risks of poor health outcomes (e.g. diabetes, hypertension)
- Bariatric surgery may also improve pregnancy outcomes (click here for more information)

Next

Preconception Health+Health Care Initiative
A National Public-Private Partnership

PREGNANCY AFTER BARIATRIC SURGERY

- Risks of maternal complications of pregnancy like Gestational Diabetes and Preeclampsia may be reduced
- Risks of neonatal complications of pregnancy like Preterm Birth and Low Birth Weight may be reduced
- Maternal nutritional deficiencies observed appear to be the result of supplement nonadherence

Back

OBESITY:
PRIMARY CARE V. PRECONCEPTION CARE (CONT.)

Unique aspects:

- Counsel about risks of poor pregnancy outcomes
- Planning for pregnancy may provide additional motivation to lose weight
- Determine reproductive plans
  - Increased risks of hormonal contraceptive failure with certain methods (e.g. oral contraceptives, contraceptive patch, contraceptive implant)

A Review of the Evidence Follows:

(as published in: Evidence-based Recommendations from the Clinical Workgroup of the CDC Select Panel on Preconception Care. American Journal of Obstetrics & Gynecology, 2008;199:S266-279; S280-289.)

Preconception Health+Health Care Initiative
A National Public-Private Partnership

EVIDENCE-BASED RECOMMENDATIONS FOR PRECONCEPTION CARE OF WOMEN WITH OBESITY

All women of reproductive age should have their body mass index (BMI) calculated at least annually. All women with BMIs $\geq$ 26 kg/m^2 should be counseled about the risks to their own health, the risks to future pregnancies and the risks of infertility. These women should be offered specific behavioral strategies to decrease caloric intake and increase physical activity. They should be encouraged to consider participation in structured weight loss programs.

Strength of evidence: A Quality of evidence: III

CASE STUDY: DEPRESSION

29 yo social worker presents to the emergency room with a complete spontaneous abortion

- Pregnancy was unintended
- History of depression controlled with paroxetine
- Followed by psychiatrist for last 5 years

BACKGROUND: DEPRESSION

- Prevalence of Major Depressive Disorder among adult women is 5-9%
- Increases risk of tobacco, alcohol and illicit drug use
- Increases risk of self-injurious behaviors
- US Preventative Services Task Force recommends routine screening

PRECONCEPTION CARE GOALS: DEPRESSION

- Implications for the woman if she conceives (click here)
- Implications for the pregnancy outcome if she conceives (click here)
- Medication considerations (click here)
- Family planning needs (click here)
- Looking beyond the disease to the whole woman (click here)

Preconception Health+Health Care Initiative
A National Public-Private Partnership

Next

DEPRESSION: IMPLICATIONS FOR THE WOMAN IF SHE CONCEIVES

- Worsening of depression
- Suicidal ideation and suicide
- Insomnia
- Anxiety
- Increased risk postpartum depression and psychosis (can also occur after any pregnancy loss)

Back

DEPRESSION: IMPLICATIONS FOR PREGNANCY OUTCOMES

- Impaired judgment leading to noncompliance with care
- Poor appetite/weight gain
- Impaired maternal-infant bonding
- Substance use

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

DEPRESSION: MEDICATIONS

Selected Medications in Pregnancy:

- SSRIs and SNRIs:
  - Possible small risk for birth defects
    - Association between paroxetine and birth defects, especially cardiac
  - Possible small risk of association with preterm birth (but depression is also associated with preterm birth)
- Transient neonatal effects of SSRIs, and other antidepressants
  - "poor neonatal adaptation" or "neonatal behavioral syndromes"
  - SSRI exposure in the third trimester may be associated with persistent pulmonary hypertension

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

DEPRESSION: FAMILY PLANNING NEEDS

- No contraindication to any commonly used contraceptive for women with depression
- Long acting progestins may increase the risk for depression
- Any drug that induces the cytochrome P450 enzymes in the liver may reduce the effectiveness of combined hormonal contraceptives.
  - Examples: St. John's wort, anticonvulsants

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

LOOKING AT AND BEYOND THE DISEASE. . .

- Every woman with a chronic disease should be aware of the potential effects of her disease and its treatments on herself, her pregnancy and her offspring, should she conceive, as well as the opportunities for maximizing a healthy outcome All women of childbearing age should be taking a multivitamin that includes folic acid every day
- All women/couples should be encouraged to develop a reproductive life plan
- All women should be routinely assessed and counseled about BMI, exercise, tobacco and alcohol use, other exposures and immunization status (see module 2)

DEPRESSION: PRIMARY CARE V. PRECONCEPTION CARE

Shared elements:

- Achieving a euthymic mood with a biopsychosocial approach
- If medical treatment is necessary, choose lowest effective dose and simplest regimen that achieves desired results

DEPRESSION: PRIMARY CARE V. PRECONCEPTION CARE (CONT.)

Unique aspects:

- Counseling about the implications of pregnancy in the setting of depression
- Counseling about risks of medication use in pregnancy (see Depression: Medications)
- Determine reproductive life plan
- Risks of untreated maternal depression may outweigh risks of medication during pregnancy
- Substance use is associated with unintended pregnancy

DEPRESSION: MEDICATIONS

Selected Medications in Pregnancy:

- SSRIs and SNRIs: possible low risk for birth defects
  - Possible association between paroxetine and CV defects
- Transient neonatal effects of SSRIs, and other antidepressants
  - "poor neonatal adaptation" or "neonatal behavioral syndromes"
  - SSRI exposure in the third trimester may be associated with persistent pulmonary hypertension

Back

Preconception Health+Health Care Initiative
A National Public-Private Partnership

A REVIEW OF THE EVIDENCE FOLLOWS:

(AS PUBLISHED IN: EVIDENCE-BASED RECOMMENDATIONS FROM THE CLINICAL WORKGROUP OF THE CDC SELECT PANEL ON PRECONCEPTION CARE. AMERICAN JOURNAL OF OBSTETRICS & GYNECOLOGY, 2008;199:S266-279; S280-289.)

A Review of the Evidence Follows:

(as published in: Evidence-based Recommendations from the Clinical Workgroup of the CDC Select Panel on Preconception Care. American Journal of Obstetrics & Gynecology, 2008;199:S266-279; S280-289.)

Preconception Health+Health Care Initiative
A National Public-Private Partnership

EVIDENCE-BASED RECOMMENDATIONS FOR PRECONCEPTION CARE OF WOMEN

Providers should screen and be vigilant for depression and anxiety disorders among women of reproductive age because treating or controlling these conditions before pregnancy may help prevent negative pregnancy and family outcomes.

Strength of evidence: B Quality of evidence: III

Preconception Health+Health Care Initiative
A National Public-Private Partnership

PRECONCEPTION CARE TIPS FOR PROVIDERS

Encourage women and their partners:

- To develop reproductive life plans
- To actively choose when or when not to become pregnant

Provide contraceptive method counseling for patients and their partners based on medical condition and reproductive life plans

Encourage women with medical conditions to discuss their desire to become pregnant with all of their providers before they become pregnant (preferably at least 3 months before desired conception)

- Consider effects of pregnancy on:
  - Patient and her condition
  - Fetus/newborn

Consult a maternal-fetal medicine specialist when appropriate

- Click here for examples of conditions which might be appropriate for preconception consultation

SOME CONDITIONS THAT MAY BENEFIT FROM PRECONCEPTION CARE WITH A MATERNAL-FETAL MEDICINE SPECIALIST

- Pregestational diabetes
- Renal insufficiency
- Lupus
- History of thromboembolism
- Antiphospholipid syndrome
- Significant cardiac disease
- History of malignancy
- Crohn's disease
- Severe pulmonary disease
- History of organ transplantation

Back

CONCLUSIONS

- Preconception health promotion is part of routine primary care
- Preconception care is not an isolated activity
- Pregnancy is part of a life-course perspective on women's health

Preconception Health+Health Care Initiative
A National Public-Private Partnership

CONGRATULATIONS,
YOU ARE NOW DONE WITH MODULE 3!

Now that you have finished Module 3 of the curriculum you have these options:

- Take the post test and register for the appropriate CMEs
- Move on to any of the other modules: we recommend they be taken in order but this is not essential.
- Explore the rest of this website for the other offerings to help you incorporate evidence-based preconception care into your practice.
- Incorporate the recommendations of this module into your clinical practice.
- Check out the National Preconception Care Clinical Toolkit online here

Preconception Health+Health Care Initiative
A National Public-Private Partnership

Next

MODULE 3 POST TEST

IF YOU DESIRE CME CREDIT FOR MODULE 3, CLICK HERE.

Preconception Health+Health Care Initiative
A National Public-Private Partnership