Shifting the Paradigm: Pre- and Inter-Conception Counseling

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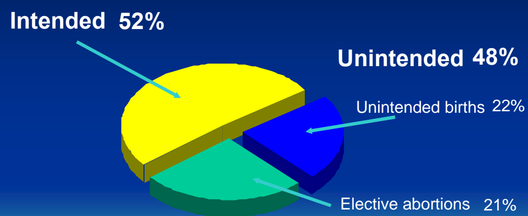
Objectives

- Discuss the concept of a "Reproductive Life Plan" and its role in preconception and inter-conception counseling.
- Describe current evidence for the importance of preconception care.
- Identify important components of preconception care.

U.S. Pregnancies: Unintended vs. Intended



Finer LB et al. *Perspectives on Sexual & Reproductive Health* 2006;38:90-96.

Unintended Pregnancies and Their Consequences

- Women aged 15–44 years
  - 48% ≥1 unintended pregnancy in lifetime
  - 30% ≥1 induced abortion
  - 28% ≥1 unplanned birth
- Maternal morbidity/mortality
- Infant morbidity/mortality

→ Family Planning

Family Planning = "Reproductive Life Plan"

- Avoiding unintended pregnancy
  - Effective use of contraception
  - Role of Long Acting Reversible Contraception (LARC)
- **Planning appropriately for desired pregnancies**

Clinical Benefits of Planned Pregnancies

Allows women to:
- Avoid toxic substances
- Initiate vitamin supplementation
- Undergo preventive testing
- Stabilize medical conditions
- Substitute/eliminate teratogenic medications

Results:
- ↓ Risk miscarriage/preterm delivery
- ↓ Risk fetal/infant morbidity/mortality

Yet only ~1 out of 6 US women receive preconception care

Risks of Unintended Pregnancy

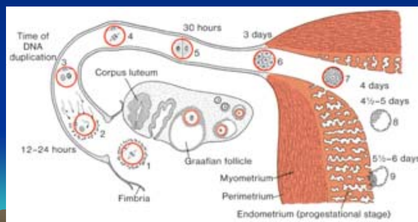
Maryland PRAMS* 2001-2005

	Intended	Unintended
Prenatal Care In 1st Trimester	87%	56%
Daily Multivitamins	42%	14%
Smoking During Pregnancy	8%	24%
Physical Abuse	3%	11%
Low birth Weight Baby	7%	10%
Breast feeding	81%	63%
"Back to sleep"	69%	50%
Postpartum Depression	15%	27%

* Pregnancy Risk Assessment Monitoring System

Risks in Early Development

Pre-embryo – first 2 weeks after fertilization
- One week preimplantation
- One week placental development



Risks in Early Development

- **Embryo – from 2 weeks after fertilization <u>(the time a woman expects her next period)</u> until 6-8 weeks after fertilization (8-10 weeks in obstetric terms)**
  - **All organs form**
  - **Key time for teratogenicity**
- Fetus
  - The remainder of the pregnancy
  - Time of organ maturation and development

A Case Example

Mary is a 37-year-old Caucasian female g0p0 who has been coming to your clinic for her annual exam for three years. She has not been sexually active during that time so has not needed contraception. Today she states she met a wonderful man and would like to talk about birth control - but only for the short term. She is planning to get married in a few months and would like to start a family right away.

Medical history – negative except ↑ bp for which she takes an ACE inhibitor

Social history – smokes 1 pack per day

Physical exam –

bp 138/84, height 5'2'', weight 180#

otherwise unremarkable

How will you counsel Mary based on her specific situation?

Components of Preconception Care

- Identification of risks
  - Medical, reproductive, and family history
  - Nutritional habits
  - Drug and environmental exposures
  - Social issues
- Provision of education based on risks
- Initiation of desired interventions

General Health

- Review healthy diet/nutrition
  - **Folic acid 400 μg → 73% ↓ in neural tube defects**
  - Iron, Calcium, Iodine, Omega-3 fatty acids

↓

Begin prenatal vitamins

- Dental check-up
  - Periodontal disease → risk of preterm labor
  - Avoid procedures during pregnancy

General Health

- Assess BMI
  - If increased →
    - Maternal risk of hypertension, diabetes, VTE
    - Fetal risk of congenital and growth abnormalities, stillbirth

      ↓

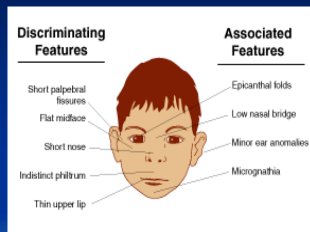
      Give specific suggestions for calorie control, exercise
      GTT if BMI > 30 or >25 with other risk factors
      Consider bariatric surgery if morbidly obese
  - If decreased → risk of infertility, IUGR
    - Rule out anorexia, malabsorption, endocrine problem
- Assess substance use/abuse

Smoking during Pregnancy

- Responsible for:
  - 7-10% of pre-term deliveries
  - 17-26% of low-birth-weight infants
  - 5-6% of perinatal deaths
- Cessation interventions proven effective
  - Reduced incidence of IUGR
  - Fewer low-birth-weight infants
  - Shown to be cost-effective

Alcohol Abuse

- No established safe level of alcohol in pregnancy
- Fetal Alcohol Effects
  - Spontaneous abortion
  - Fetal growth restriction
  - Physical anomalies
  - Neurologic deficits
- Most common preventable cause of mental retardation



Fetal Alcohol Syndrome (4-6 drinks/day)

How many drinks do you have per week? Per day?

Other Mood-Altering Substances

- Cocaine
  - Teratogenic
  - ↑ Abruptio placenta, preterm labor
  - Neonatal withdrawal
- Opiates
  - Neonatal withdrawal
- Marijuana
  - Possible effects on intellectual development

Have you used any drugs other than for medical conditions?

Importance of Spacing Pregnancies (Reproductive Life Plan)

Table 5. Meta-analysis of Dose-Response Regression Slopes and Prediction of the Risk of Adverse Perinatal Outcomes for Interpregnancy Intervals <18 Months and >59 Months

Risk Increase	Increase, % (95% CI) Preterm Birth (12 Studies)	LBW (7 Studies)	SGA (12 Studies)
Per month for intervals <18 mo*	1.92 (1.80-3.04)	3.25 (3.09-3.41)	1.52 (1.40-1.64)
Per month for intervals >59 mo†	0.55 (0.49-0.61)	0.91 (0.83-0.99)	0.76 (0.71-0.81)
Predicted by the model			
Interpregnancy interval, mo			
3	28.8 (27.0-30.6)	48.8 (46.4-51.2)	22.8 (21.0-24.6)
6	23.0 (21.6-24.5)	39.0 (37.1-40.9)	18.2 (16.8-19.7)
9	17.3 (16.2-18.4)	29.3 (27.8-30.7)	13.7 (12.6-14.8)
12	11.5 (10.8-12.2)	19.5 (18.5-20.5)	9.1 (8.4-9.8)
15	5.8 (5.4-6.1)	9.8 (9.3-10.2)	4.6 (4.2-4.9)
18-59‡	1.00	1.00	1.00
72	6.6 (5.9-7.3)	10.9 (10.0-11.9)	9.1 (8.5-9.7)
96	19.8 (17.6-22.0)	32.8 (29.9-35.6)	27.4 (25.6-29.2)
120	33.0 (29.4-36.6)	54.6 (49.8-59.4)	45.6 (42.6-48.6)
144	46.2 (41.2-51.2)	76.4 (69.7-83.2)	63.8 (59.6-68.0)

Abbreviations: CI, confidence interval; LBW, low birth weight; SGA, small for gestational age.
*Risk increase per each month that interpregnancy interval is shortened from 18 months.
†Risk increase per each month that interpregnancy interval is lengthened from 59 months.
‡Reference category.

Conde-Agudelo, A. et al. JAMA 2006;295:1809-1823.

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Maternal Age

- Age ≥ 35 at delivery
  - Decreased fertility
  - Increased maternal and fetal complications
  - Risk of trisomy 21, 13, 18 increase with age

	Risk of trisomy 21	Risk of any aneuploidy
Age 35	1/378	1/192
Age 40	1/106	1/66
Age 45	1/30	1/21

Other Genetic Risk Factors

- Family history
  - Birth defects
  - Common genetic disorders
- Pregnancy history (patient and partner)
  - Previous stillbirth
  - Recurrent miscarriage

→Consider referral to genetic counselor

Offer Carrier Screening

Disease	Background	Carrier rate
Sickle cell	African-American, Middle Eastern, Mediterranean, Caribbean	1/12
Cystic Fibrosis	Northern European	1/23
Tay-Sachs	Ashkenazi Jewish, French-Canadian, Cajun	1/30
β-Thalassemia	Mediterranean, Southeast Asian, Indian, Pakistani, African	1/30
α-Thalassemia	Southeast Asian, Chinese, African	1/25

Immunizations Up To Date

- Tetanus - diphtheria-pertussis (Tdap)
- Screen for rubella immunity
  - If negative, give measles, mumps, and rubella
- Screen for Varicella immunity
  - If negative, immunize
- Hepatitis B, if not previously immunized
- Influenza
- HPV if age $\leq$ 26

Infectious Disease

- Screen for HIV
- Chlamydia, Gonorrhea, and Syphilis screen if high-risk
- Ask about history of HSV infection, patient and partner
  - If patient positive, counsel about risks
  - If patient negative and partner positive, test patient
- Toxoplasmosis screen, if requested
  - If screen negative, counsel preventive measures during pregnancy
- Cytomegalovirus
  - If around young children, advise precautions

Stabilize Medical Conditions

- Diabetes mellitus
  - Counsel about risk of fetal and maternal complications, possible hospitalization
  - Type II may require insulin
  - **Tight preconception glucose control → ↓ risk of birth defects**
- Hypertension
  - Counsel about risk of preeclampsia, fetal growth restriction, abruptio placenta
  - Check for retinopathy, nephropathy
  - Evaluate teratogenicity of current therapy

- Thyroid disease – check thyroid profile
  - Hypothyroidism
    - If inadequate replacement → ↑ low-birth-weight infants, preeclampsia
  - Hyperthyroidism
    - If inadequately controlled→ ↑ low-birth-weight infants, preterm delivery
- Epilepsy
  - Counsel about risk of birth defects
    ? related to medications or the disease itself
  - If no seizures for 2 years, give trial off medication
  - If therapy required, evaluate teratogenicity and give lowest possible dose of monotherapy

- Asthma
  - Counsel that 1/3 will worsen
  - Physiologic changes promote maternal hypoxemia
- Sickle cell disease
  - Counsel that pregnancy → ↑ risk of frequency/severity of crises, maternal mortality; 30% risk of fetal mortality
- Others
  - Cardiovascular disease
  - Renal disease
  - Gastrointestinal and hepatic conditions
  - Thrombophilia
  - Autoimmune diseases
  - Depression/Psychiatric conditions

In the past 2 weeks, have you felt depressed or hopeless?

Medications in Pregnancy and Breast Feeding: Pregnancy Risk Factors (PRF)

PRF Category	Description
A	Controlled human studies demonstrate no evidence of risk in pregnancy in any trimester and the possibility of fetal harm appears remote.
B	Animal-reproduction studies have not demonstrated fetal risk and there are no controlled human studies, or Animal – reproduction studies have demonstrated an adverse effect that was not confirmed in controlled human studies in the first trimester and there is no evidence of a risk in later trimesters.
C	Anima-reproduction studies have demonstrated an adverse fetal effect and there are no controlled human studies or Animal-reproduction and human studies are not available so that drugs should be given only if the potential benefits justify the potential risk to the fetus.
D	Positive evidence of human fetal risk exists but use may be acceptable despite the fetal risk if the drug is needed in a life-threatening situation, or for a serious disease for which safer drugs cannot be used or are ineffective.
X	Animal-reproductive and / or human studies demonstrate fetal abnormalities such that the risk of the use of the drug in pregnant women clearly out weighs any possible benefit. *Use of Class X drugs is contraindicated in women who are or may be come pregnant.*

Known Teratogenic Medications

- Androgens
- ACE inhibitors
- Antiepileptics
- Coumadin
- Isotretinoin
- Lithium
- Streptomycin
- Tetracycline

Over-the-Counter Medications

- Minimize use
- Discontinue aspirin
- The safety of most “dietary supplements” in pregnancy is unknown
- Fat soluble vitamins (especially vitamin A) can be teratogenic if overdosed

Environmental Exposures

- Mercury
  - Avoid eating shark, swordfish, king mackerel, tilefish
  - Limit other fish to 3 oz twice a week
- Water hazards
  - Have well water checked
  - Bisphenol A (BPA) in water bottles
- Workplace
  - Exposure to toxins, e.g. organic solvents, mercury, lead, vinyl monomers, pesticides, radiation
  - Heavy lifting, prolonged standing, night shifts

Psychosocial Risks

- Inadequate financial resources
- Access to care
- Relationship status
  - Partner supportive? Other family members?
  - Physical/sexual abuse
    - 4-8% of pregnant women are physically abused → abruptio placenta, fetal fractures, preterm birth, rupture of uterus, liver, spleen, etc.
    - Prior abuse likely to continue or ↑ in pregnancy

Do you feel safe at home? Does anyone threaten or hurt you?

Putting It All Together

Mary is a 37-year-old Caucasian female who has been coming to your clinic for her annual exam for three years. She has not been sexually active during that time so has not needed contraception. Today she states she met a wonderful man and would like to talk about birth control - but only for the short term. She is planning to get married in a few months and would like to start a family right away.

- Medical history – negative except ↑ bp for which she takes an ACE inhibitor
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- Physical exam –
  - bp 138/84, height 5'2'', weight 180#
  - otherwise unremarkable

What are some additional counseling points you have learned?

Additional Planning

- Discontinuing contraception
- Recommend patient keep a menstrual calendar
- Emphasize importance of early and continuous prenatal care, structured based on patient's individual risks

WHAT A LOT TO THINK ABOUT!

Guidelines and Checklist in your handout and available at: www.coloradoguidelines.org/pdf/preconception/MarchofDimes_Screening.pdf

The Goal of Preconception Care….