# Women's Heart Health:

## The Importance of a Cross Disciplinary Approach

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#WHVSymposium19
Friday, November 15, 2019

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# DISCLOSURES

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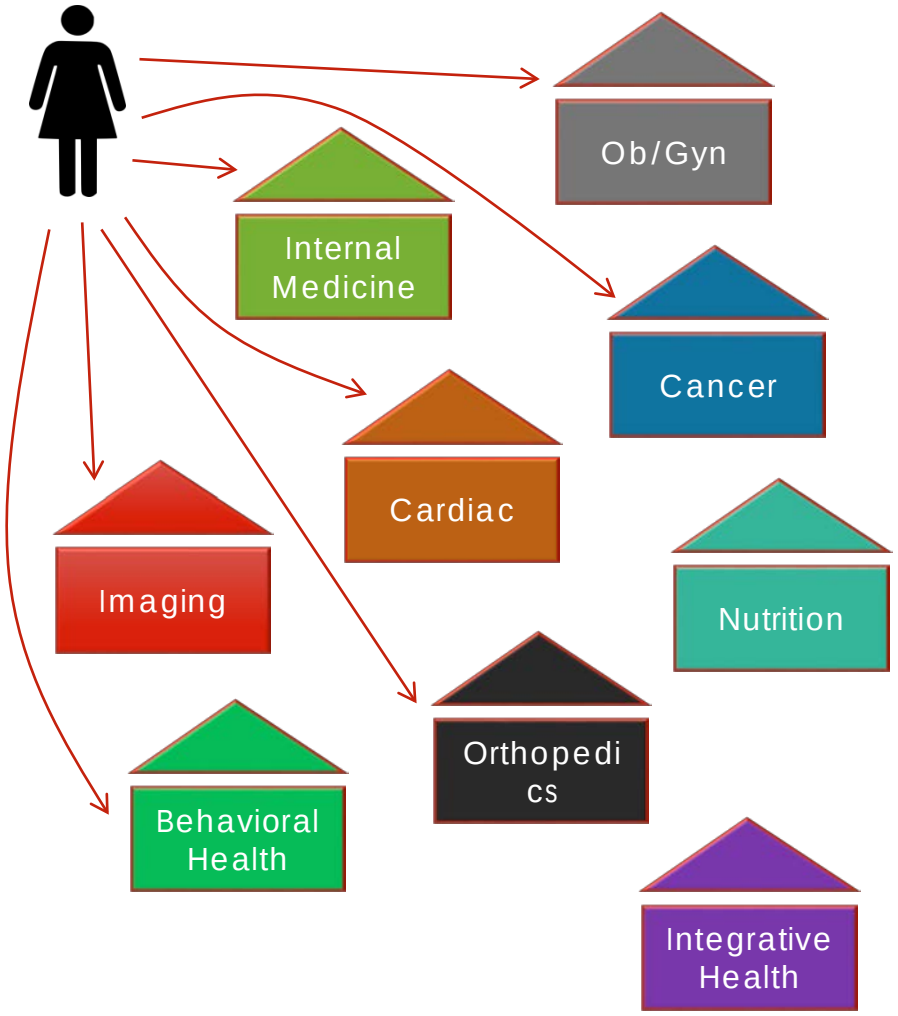
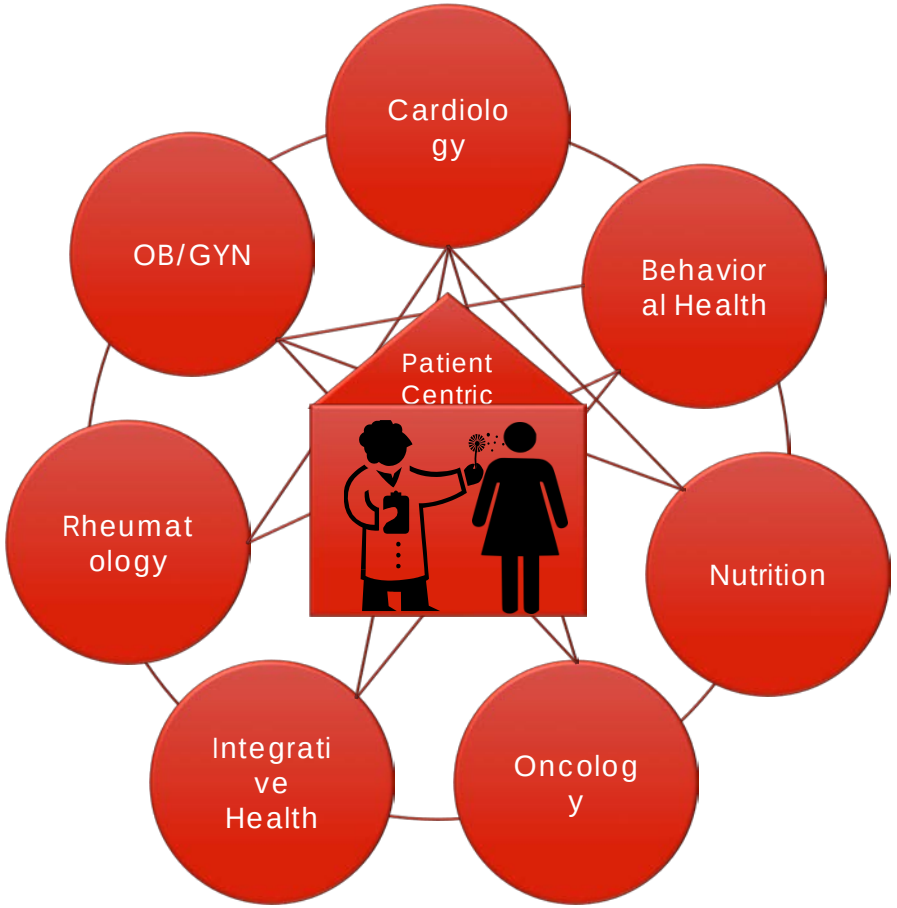
- We must be able to show that everyone who is in a position to control the content of an educational activity has disclosed all relevant financial relationships with any commercial interest to the provider and that any conflicts are resolved.

| **Presenter** | **Disclosure** |
| --- | --- |
| Rachel M Bond, MD | None |

# Clinical Services to Promote Collaborative Care: Break the traditional "silo" approach

*Enhancing care by redefining the health care delivery model*



# MAY 3, 2019 - ACOG RELEASES COMPREHENSIVE GUIDANCE ON HOW TO ADDRESS THE LEADING CAUSE OF U.S. MATERNAL DEATHS: HEART DISEASE IN PREGNANCY

The American College of Obstetricians and Gynecologists
WOMEN'S HEALTH CARE PHYSICIANS

## ACOG PRACTICE BULLETIN

Clinical Management Guidelines for Obstetrician–Gynecologists

NUMBER 212

**Presidential Task Force on Pregnancy and Heart Disease**

**Committee on Practice Bulletins—Obstetrics.** This Practice Bulletin was developed by the American College of Obstetricians and Gynecologists' Committee on Practice Bulletins–Obstetrics in collaboration with the Presidential Task Force on Pregnancy and Heart Disease members Lisa M. Hollier, MD, James N. Martin Jr., MD, Heidi Connolly, MD, Mark Turrentine, MD, Afshan Hameed, MD, Katherine W. Arendt, MD, Octavia Cannon, DO, Lastascia Coleman, ARNP, CNM, Uri Elkayam, MD, Anthony Gregg, MD, MBA, Alison Haddock, MD, Stacy M. Higgins, MD, FACP, Sue Kendig, JD, Robyn Liu, MD, MPH, FAAFP, Stephanie R. Martin, DO, Dennis McNamara, MD, Wanda Nicholson, MD, Patrick S. Ramsey, MD, MSPH, Laura Riley, MD, Elizabeth Rochin, PhD, RN, NE-BC, Stacey E. Rosen, MD, Rachel G. Sinkey, MD, Graeme Smith, MD, PhD, Calondra Tibbs, MPH, Eleni Z. Tsigas, Rachel Villanueva, MD, Janet Wei, MD, and Carolyn Zelop, MD.

## Pregnancy and Heart Disease


#WHVSymposium19

Circulation

AHA/ACOG PRESIDENTIAL ADVISORY

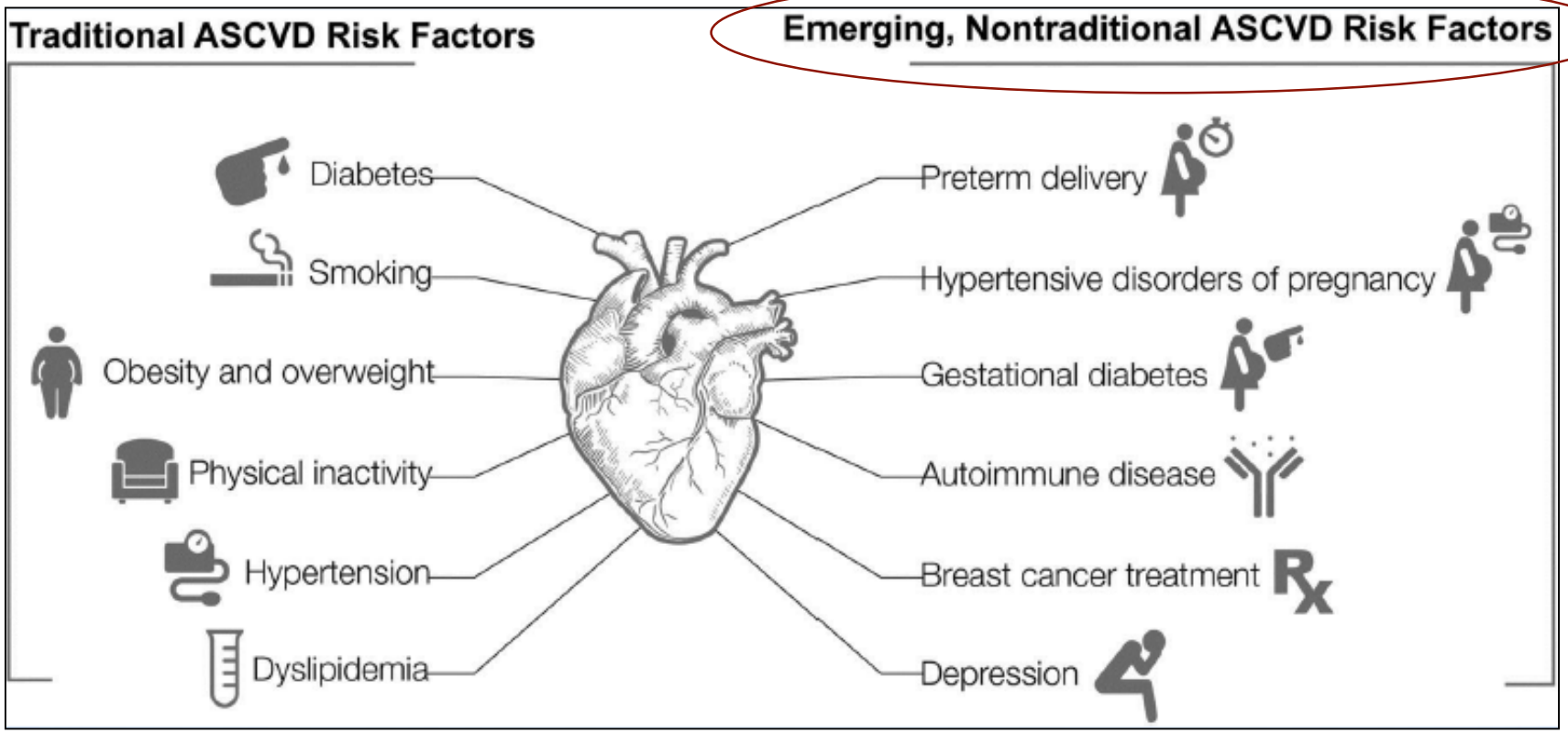
# Promoting Risk Identification and Reduction of Cardiovascular Disease in Women Through Collaboration With Obstetricians and Gynecologists

A Presidential Advisory From the American Heart Association and the American College of Obstetricians and Gynecologists

**"OB/GYNs are primary care providers for many women, and the annual 'well woman' visit provides a powerful opportunity to counsel patients about achieving and maintaining a heart-healthy lifestyle, which is a cornerstone of maintaining heart health"** -- John Warner, M.D. president of the American Heart Association, executive vice president for Health System Affairs at University of Texas Southwestern Medical Center in Dallas, Texas.

**"As the leading healthcare providers for women, OB-GYNs provide care that goes far beyond reproductive health and are in a unique position to screen, counsel and educate patients on heart health. By acknowledging and discussing the risks and communicating steps women can take to reduce their odds of developing heart disease. OB-GYNs have a powerful opportunity to be the secret weapon in the fight against heart disease,"** -- Haywood L. Brown, M.D., immediate past president of ACOG and F. Bayard Carter Professor in the department of obstetrics and gynecology at Duke University Medical Center in Durham, North Carolina.

# WHAT SHOULD THE APPROACH BE FOR OUR FEMALE PATIENTS?




Mariana Garcia et al. Circ Res. 2016; 118: 1273-1293.

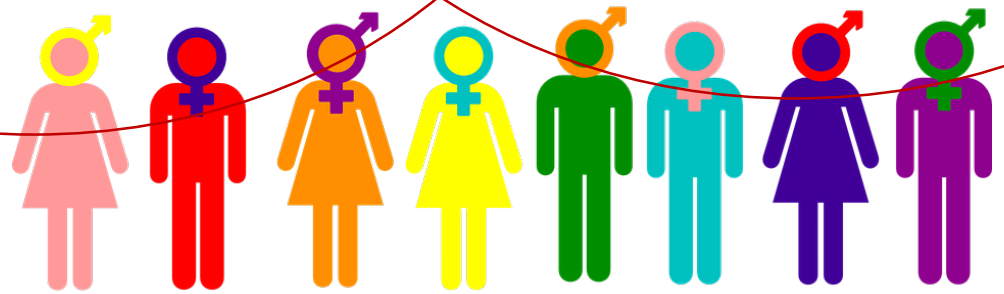
# SEX ≠ GENDER

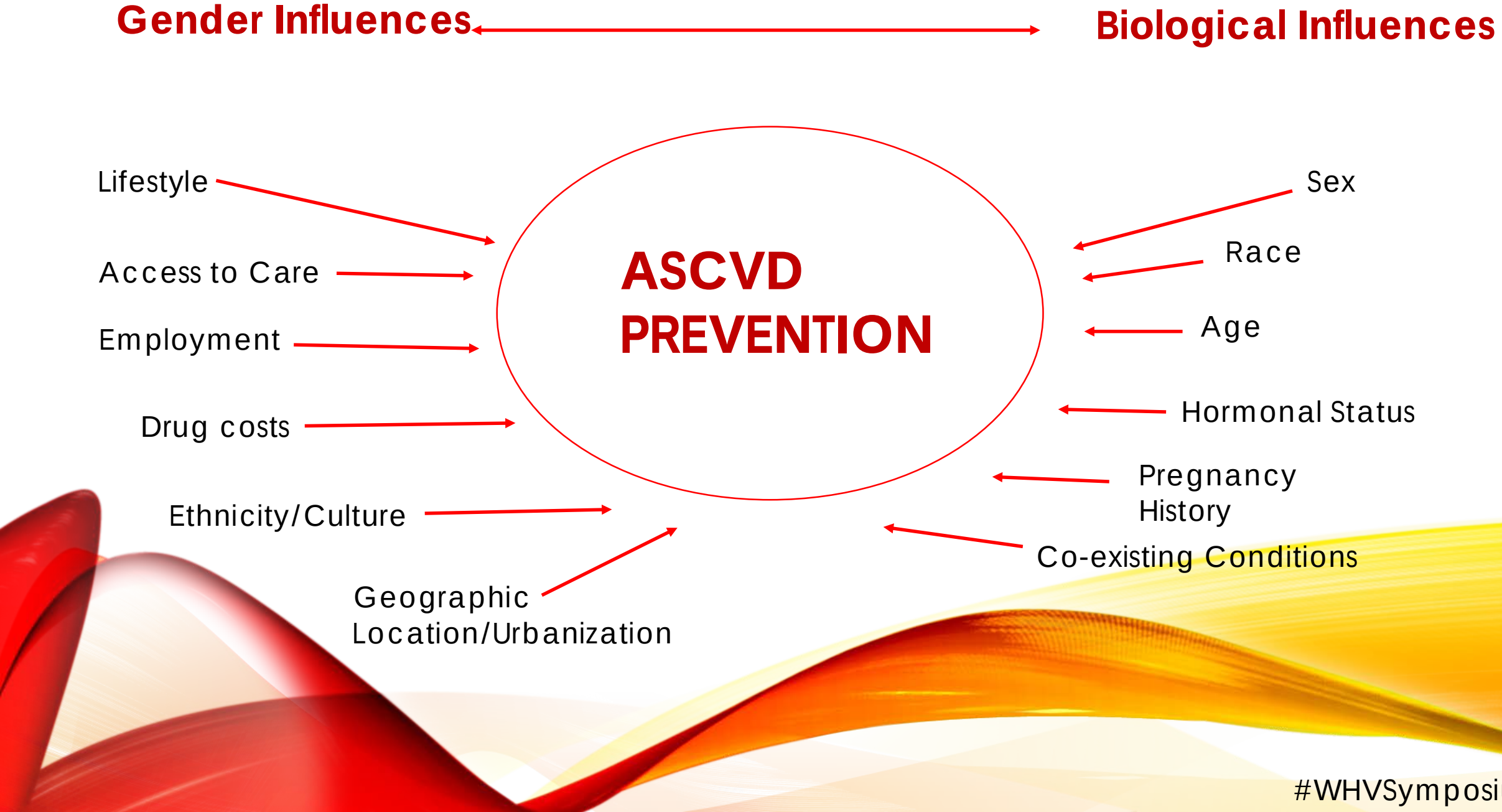
**Sex**

Biological (Reproductive Organs)

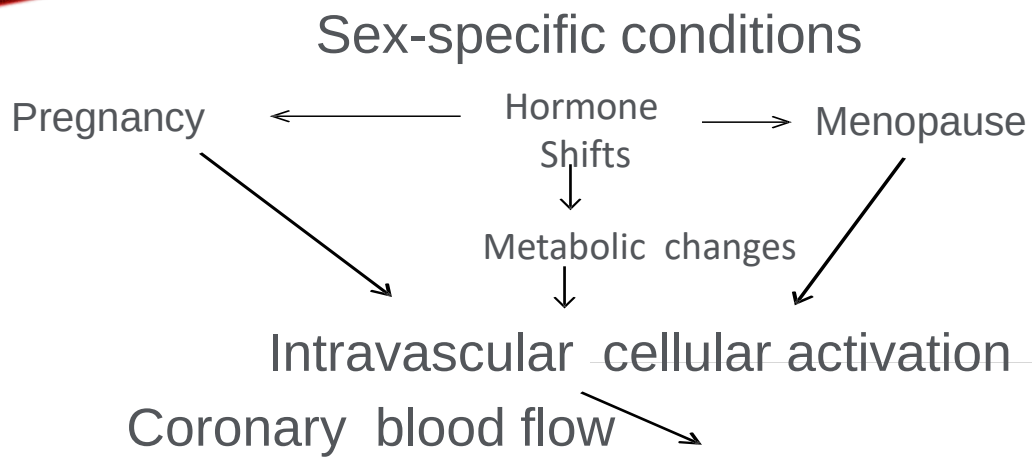
**Gender**

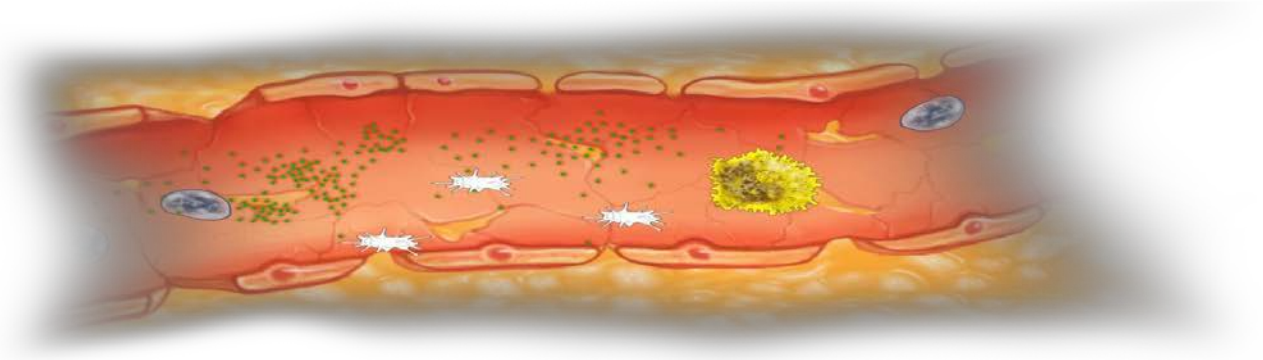
Person's "self-representation"




Gender Influences
Biological Influences
Lifestyle
Access to Care
Employment
Drug costs
Ethnicity/Culture
Geographic Location/Urbanization
ASCVD PREVENTION
Sex
Race
Age
Hormonal Status
Pregnancy History
Co-existing Conditions

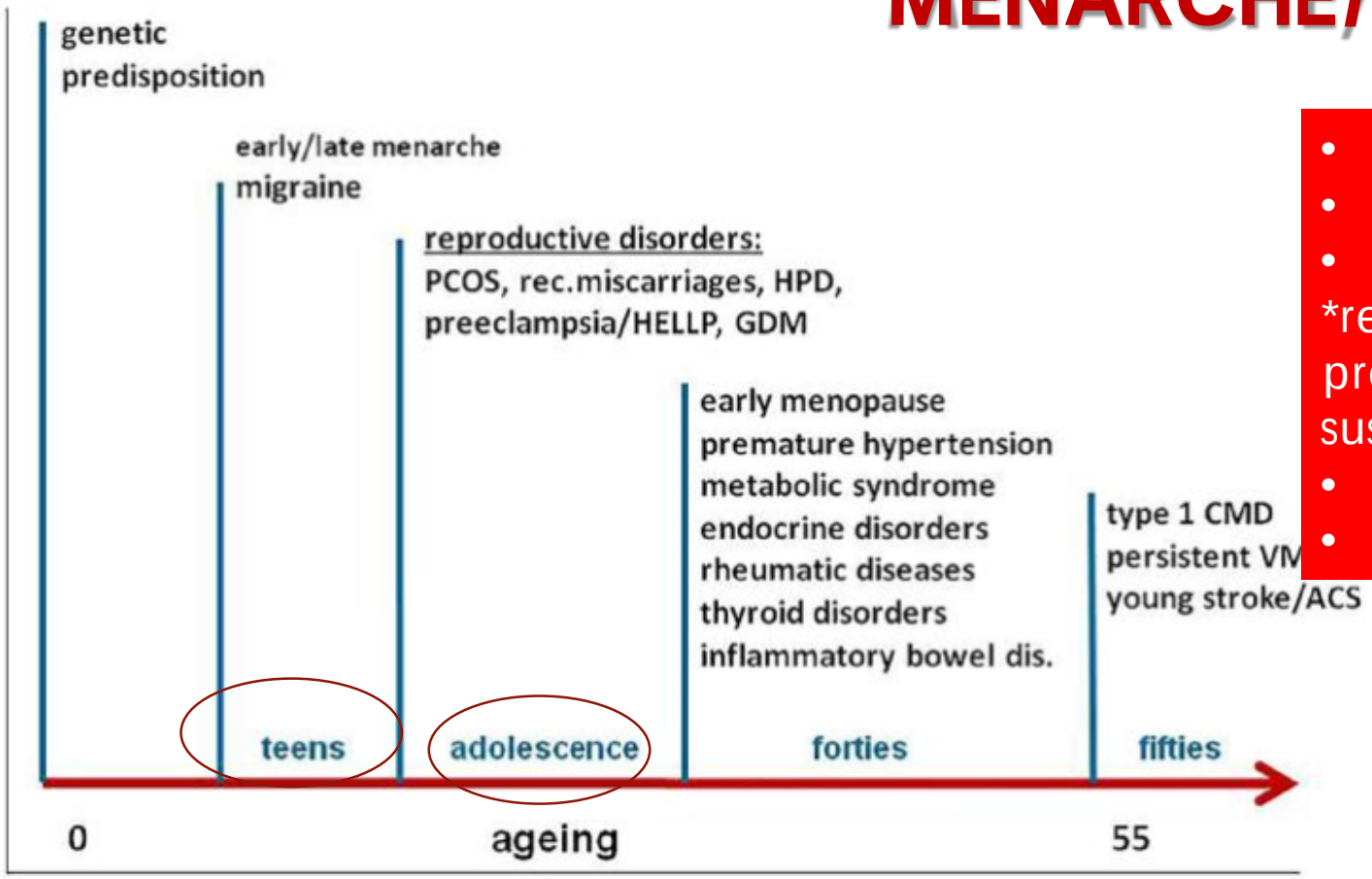
# SEX HORMONES MATTER



Miller, et al. *Biology of Sex Differences* (2013) 4:6

# HORMONE SHIFTS: MENARCHE/REPRODUCTIVE DISEASES




- Early Menarche (before age 12)
- Screen genetic predisposition (e.g. FH)
- Migraines

*related to increased family risk for CVD, premature vascular dysfunction and higher susceptibility for thrombosis and inflammation

- Functional hypothalamic amenorrhea
- PCOS

ACS: acute coronary syndromes; CMD: coronary microvascular dysfunction; CVD: cardiovascular disease; GDM: gestational diabetes mellitus; HELLP: haemolysis, elevated liver enzymes and low platelets syndrome; HPD: hypertensive pregnancy disorders; PCOS: polycystic ovary syndrome; VMS: vasomotor symptoms

Elias-Smale SE et al. Maturitas 2015.

# PREGNANCY: "METABOLIC STRESS TEST" THAT PREDICTS DEVELOPMENT OF FUTURE CVD

- **Preterm Delivery**
  - 6-12% of all births
- **Gestati**
  **Preecla**
  - 3-14
    25%
    birth
  - 3.8 X
  - 11.6 X more likely to develop HTN
- **Gestational Diabetes**
  - 5% of all pregnancies
  - Up to 70% develop Type 2 DM < 5 yrs
- **Intrauterine Fetal Growth Restrictions**
  - Increased risk for DM2
  - Obesity

CHF)

>80% of women bear at least 1 child
~30% of women have Adverse Pregnancy Outcomes

Uri Elkayam et al. Circulation. 2014; 129: 1695-1702.
Brown H Warner J, et al. Circulation 2018. May 10, 2018.

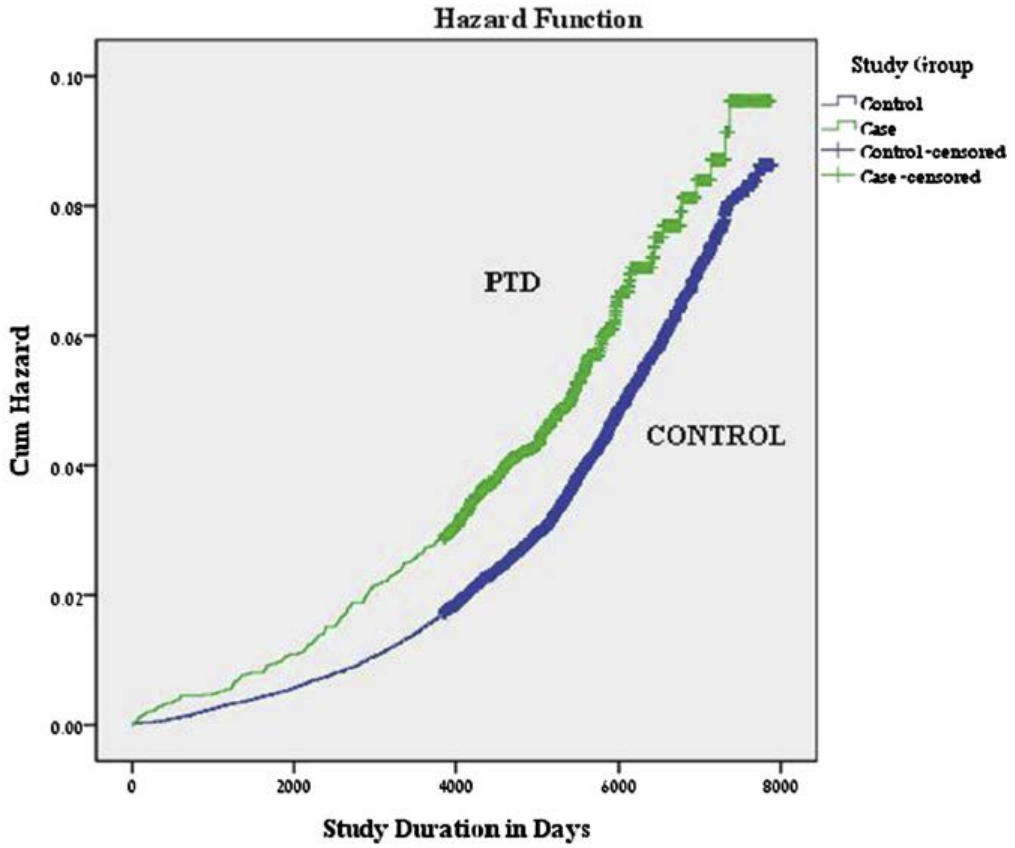
# PRETERM DELIVERY (PTD) AND CVD EVENTS

- Cohort (N=47,908):

Women who delivered preterm (<37 weeks' gestation)

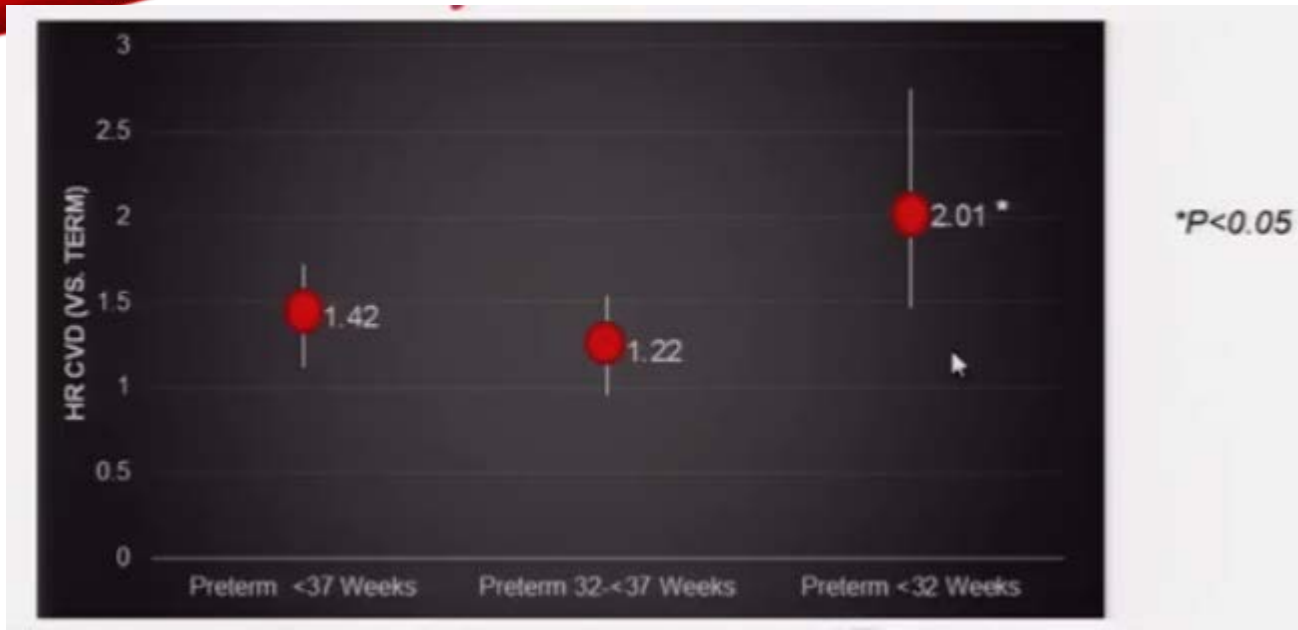
[N=5992 (12.5%)] vs. Normal term birth at the same period

- During a follow-up period of >10 years, patients with **PTD** had **higher rates** of simple and complex **cardiovascular events** and higher rates of total **cardiovascular-related hospitalization**




Kessous et al. An association between preterm delivery and long-term maternal cardiovascular morbidity. Am J Obstet Gynecol. 2013; 209(4): 368.

# VERY PRETERM DELIVERY AND CVD RISK




- Women who deliver their first child preterm (<37 weeks) experience a 40% increased risk of CVD
- Women with a **very preterm first birth** (<32 weeks) have **double the risk**; <25% of this increased risk is explained by HTN, hypercholesterolemia, DMII, Change in BMI after pregnancy.

Tanz LJ et al. Circulation. 2017; 135: 578-589.

# PREGNANCY RELATED DISORDERS & CVD RISK ASSOCIATION

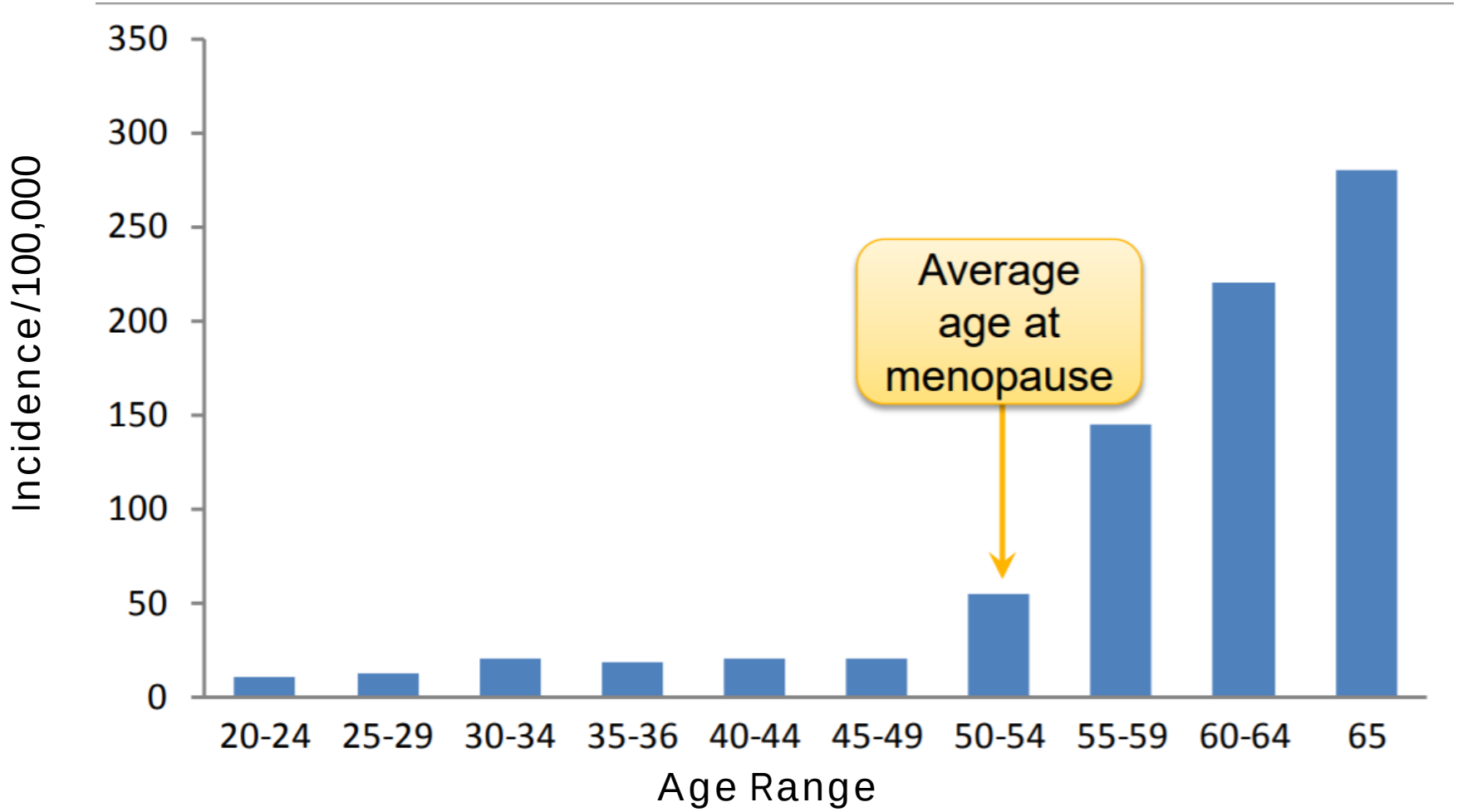
| | Type 2 DM | HTN | CVD Events |
|---|---|---|---|
| GDM | 1a | ND | 1b |
| Preeclampsia | 1a | 1a | 1a |
| G-HTN | 1a | 1b | 1a |

Level of evidence based on Oxford classification.

- <u>The Evidence to Date:</u>
- GDM: Level 1A evidence as a RF for DM (>7x)
- HDP: Level 1A evidence as RF for DM (1.8x)
- HDP: Level 1A as RF for HTN (3.7x)
- Preeclampsia: Level 1A RF for CVD/Mortality (2>)
- GDM: Level 1B evidence as a risk factor for CVD/Mortality (1.7x)

*Nerenberg N et al. Canadian Journal of Cardiology 2014;1-14*

# INCIDENCE IN CARDIOVASCULAR EVENTS IN WOMEN BEFORE AND AFTER MENOPAUSE




Hu FB et al: New Engl J Med 343:530, 2000

# EARLY MENOPAUSE ASSOCIATED WITH CHD AND CVA IN WOMEN

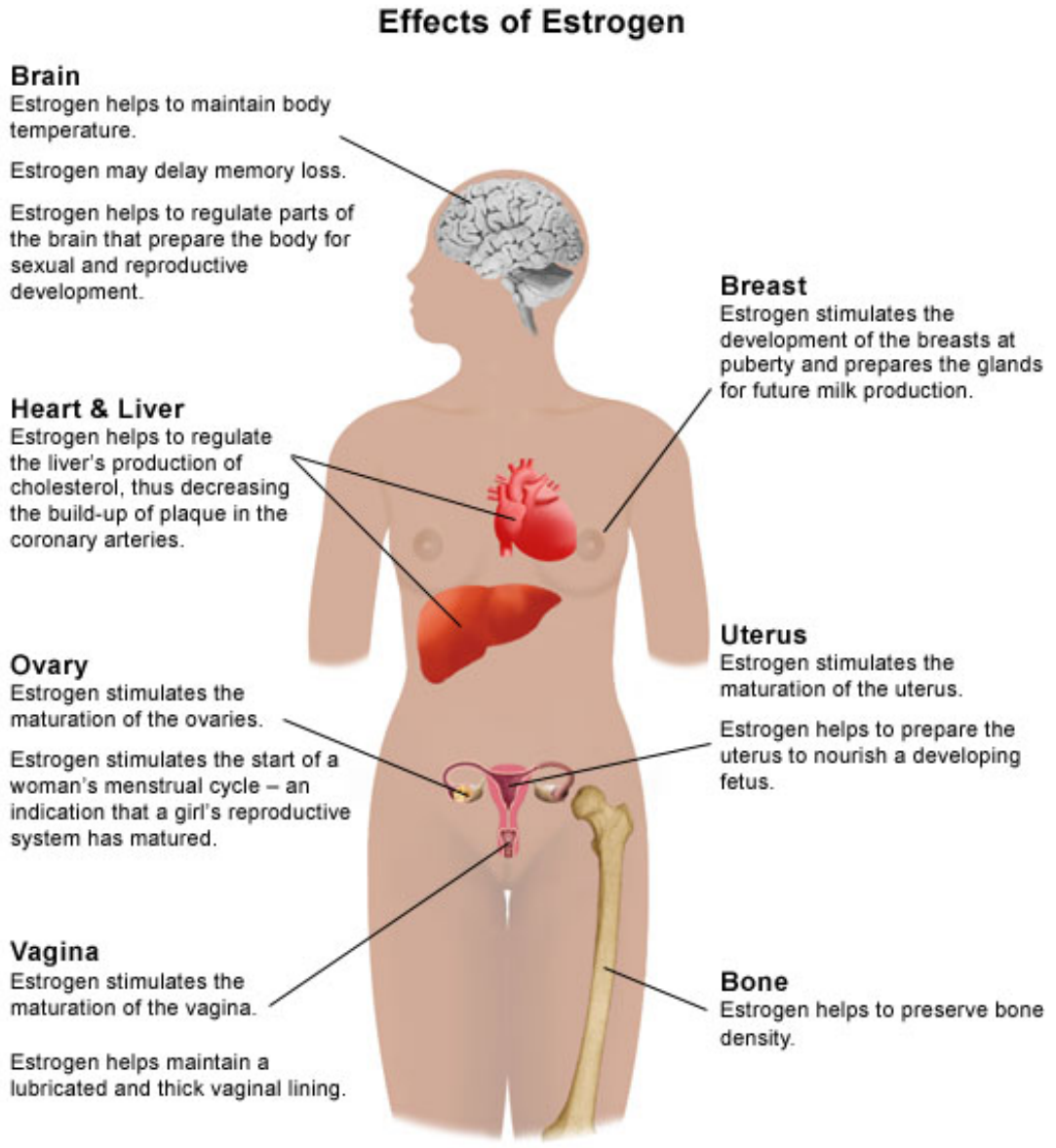
Wellons, 2012

| Female-Specific CVD RF | Female-Predominant CVD RF |
|---|---|
| Adverse Pregnancy Outcomes | Autoimmune Inflamm Disease |
| HDP-Gestational HTN, Preeclampsia, Eclampsia | Rheumatoid Arthritis |
| GDM | SLE |
| Preterm delivery/Low Birth Weight | Scleroderma |
| Reproductive Disorders | |
| Polycystic Ovarian Syndrome | Breast Cancer |
| Functional hypothalamic amenorrhea | Disorders of Mental Health |
| Early menarche (<12 yo) | Depression |
| Early menopause (<47 yo) | Anxiety |
| OCP | Stress |
| HRT | |
| IVF | |

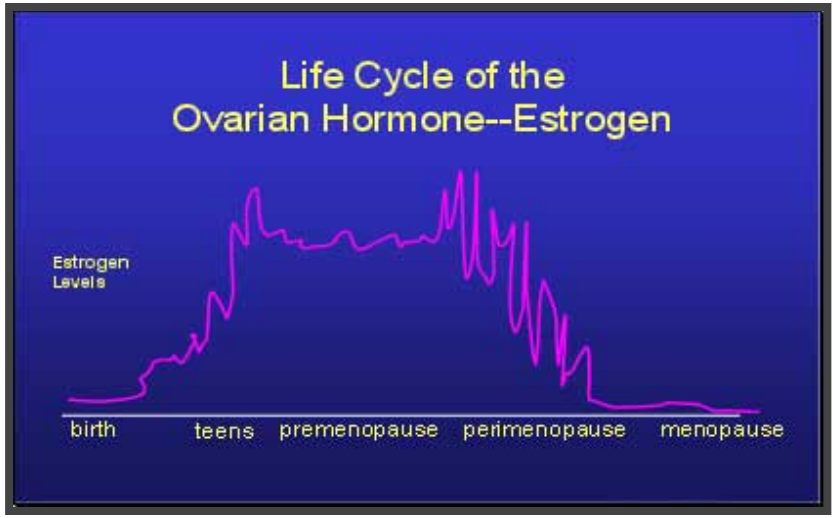
Haywood Brown, et al. AHA/ACOG Presidential Advisory. Circulation. May 2018.

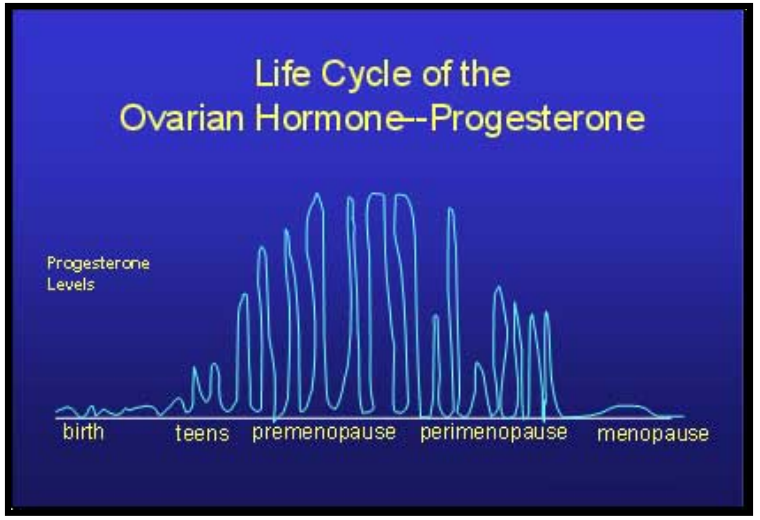
# Hormone replacement therapy.
# Is it dangerous to the heart?

- Critical to reproductive function in men & women
- Most produced by ovaries
- Some arises from fat, liver, breasts, adrenals
- Complex physiologic effects



# CHANGING ESTROGEN LEVELS WITH AGE




Estrogen

Progesterone

Perimenopausal Symptoms: hot flashes, insomnia, mood changes

Menopausal Physiology: osteoporosis, vaginal mucosal thinning

# THE GOOD AND BAD OF ESTROGEN REPLACEMENT

## Good

- Relief of menopausal symptoms
- Reduction in osteoporosis (bone thinning) and fractures
- Improvement in lipid profile

## Bad

- Breast cancer risk
- Uterine cancer risk
- Complex formulation

**Cardio-protective effects??**
**Not proven!**

# WOMEN'S HEALTH INITIATIVE

16,608 Post-menopausal women aged 50-79 with an intact uterus

- Estrogen + Progesterone →
- Placebo →

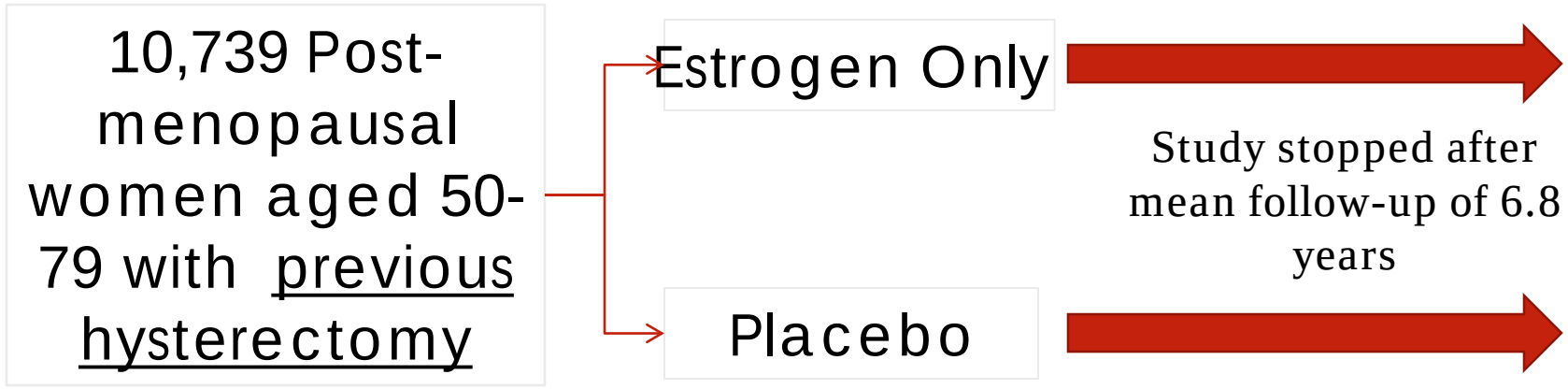
Study stopped after mean follow-up of 5.6 years

Hormonal replacement associated with:

- Increased heart disease (29% ↑)
- Increased stroke (41% ↑)
- Increased blood clots
- Increased breast cancer (26% ↑)
- Reduced colon cancer
- Reduced hip fracture

Conclusion: HRT should not be used to prevent disease in healthy post-menopausal women

# WOMEN'S HEALTH INITIATIVE: ESTROGEN ONLY STUDY




Estrogen replacement associated with:

- 9% reduction in heart disease
- 39% increase stroke
- 33% increase blood clots
- No change in cancer
- 39% reduction hip fracture

# WOMEN'S HEALTH INITIATIVE: ESTROGEN ONLY STUDY

| Age Group | Risk of Coronary Heart Disease | Risk of Stroke |
|---|---|---|
| 50-59 | 37% reduction | 11% reduction |
| 60-69 | 6% reduction | 62% increase |
| 70-69 | 13% increase | 21% increase |
| Overall | 9% reduction | 39% increase |

Source: JAMA 2007;297:1477

Conclusion: In younger post-menopausal women post hysterectomy, estrogen alone may be beneficial

- **Higher Risk/Avoid MHT**
  - Known ASCVD/ CAD/ PAD
  - Known venous thrombosis or pulmonary embolism
  - Known Stroke/TIA or MI
  - Known Clotting Disorder
  - Known Breast Cancer
  - 10 year ASCVD Risk ≥7.5%
- **Definite Risk for CVD/Caution with MHT**
  - Diabetes
  - Smoking
  - Uncontrolled HTN
  - Obesity/ Sedentary/ Limited mobility
  - SLE/RA/Migraine with Aura
  - High TG or uncontrolled Cholesterol levels
  - 10 year ASCVD Risk ≥5-7.4%
- **Lower Risk/Acceptable for MHT**
  - Recent menopause, normal weight, normal blood pressure, active female
  - 10 year ASCVD Risk <5%

*Menopausal Hormone Replacement (MHT)

Printed from: Lundberg GP, Wenger NK. Menopause Hormone Therapy: What a Cardiologist Needs to Know. JACC: Expert Analysis; July 18, 2019.

# ORAL VS. TRANSDERMAL ESTROGEN

## Oral Estrogen

- Large impact on liver metabolism
- Increase in inflammatory markers
- Increase in protective HDL cholesterol

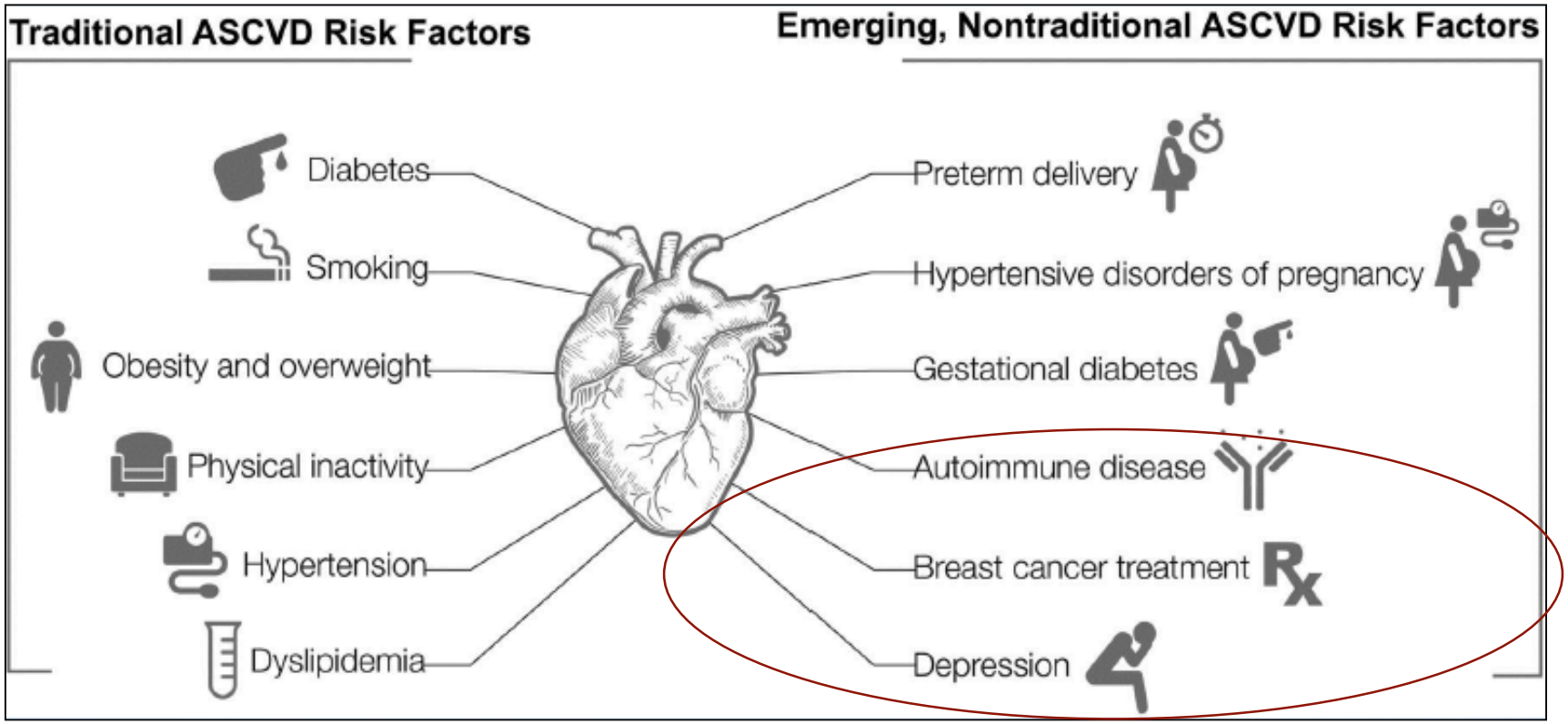
## Transdermal Estrogen

- Bypasses liver
- No change in Inflammatory markers
- Reduction in LDL
- Improvement in “atherogenic index of plasma”
- Reduction in oxidation index

# ESTROGEN REPLACEMENT: THE REALITY

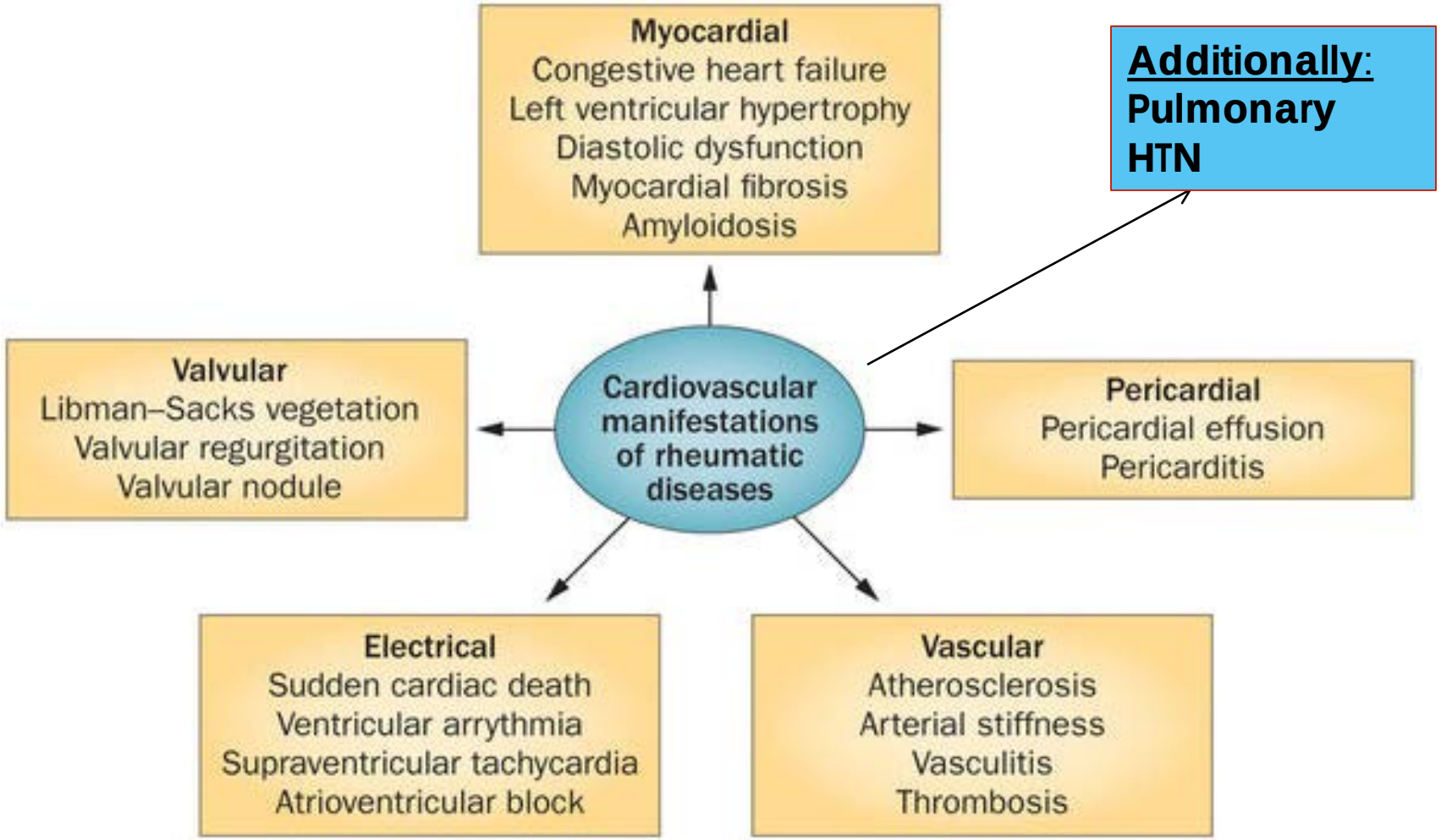
- Individualized risk assessment is key
- Estrogen therapy is reasonable for the relief of perimenopausal symptoms if started early and tapered after a few years (do not start if >10 years from menopause and/or older than 60 years of age)
- Estrogen administered transdermally may be less likely to increase risk of blot clots
- Estrogen should **NEVER** be given to reduce CVD risk

# WHAT SHOULD THE APPROACH BE FOR OUR FEMALE PATIENTS?




Mariana Garcia et al. Circ Res. 2016; 118: 1273-1293.

# AUTOIMMUNE DISEASE




Prasad M, et. Al. Cardiorheumatology: cardiac involvement in systemic rheumatic disease. Nat Rev Cardiol. 2015 Mar; 12(3): 168–176.

# AUTOIMMUNE DISEASE

- A systematic review which included 28 studies found that the **risk for CVD among SLE patients** at least **doubled** **when compared with the general population**.
    - Traditional CVD risk factors, disease duration & activity, appear to further ↑ the risk.

- Younger SLE patients were found to have a greatest relative risk of CVD compared with their healthy counterparts, but the absolute risk ↑ in older patients.

- **2011 guidelines for the prevention of CVD in women** incorporated screening for SLE, RA along with screening those who have these conditions for CVD.

S.R. Schoenfeld, S. Kasturi, K.H. CostenbaderThe epidemiology of atherosclerotic cardiovascular disease among patients with SLE: a systematic review. Semin Arthritis Rheum, 43 (2013), pp. 77-95

# HEART DISEASE SECONDARY TO BREAST CANCER

- **Heart Disease and Breast Cancer Radiation:**
  - Left vs. Right Breast: Increased risk of CAD & MI
  - Rate of coronary events ↑by 7.4%/Gray (P<0.001)
- **Heart Disease and Anthracyclines (Doxorubicin)**
  - Cumulative dosing
  - Increased risk if age>65, radiation, female sex
  - Reported 10-50% with some degree of heart failure in following 10 years
- **Heart Disease and Herceptin (Tratuzumab):**
  - Increased risk if age >50, BMI>30, previous LV dysfunction, hypertension, previous radiation therapy
- **Heart Disease with Combination Chemotherapy**
  - 12,500 Women: 7X more likely to develop heart disease or CHF if received both anthracycline and Herceptin

Harris et al. J Clin Oncology 2006: 26: 1390
Marcom et al. J Clin Oncology. 2007.
Serrano et al. Annals of Oncology. 2011
Bowles et al. Journal NCI. 2012: 104: 1293-1305
Darby et al. NEJM 2013. 368: 987-998.

# PSYCHOSOCIAL FACTORS

- **Psychosocial problems preferentially disadvantage women**
  - **Depression** has **higher incidence in women** when compared to men by 1.7 folds & can confer a 1.64 relative risk for developing CVD.
  - **Anxiety** is seen in **1 out of 3 women** at any point in their lifetimes, compared to only 22% of men.
  - **Stress**, when persistent, can have a negative effect on the heart, is also **more frequently** perceived in women

- **In the INTERHEART study, psychosocial factors were associated with cardiovascular mortality more for women (45.2%) than men (28.8%)**

Dhar AK, Barton DA. Depression and the Link with Cardiovascular Disease. Frontiers in Psychiatry. 2016;7:33. doi:10.3389/fpsyt.2016.00033.
Allgulander C. Anxiety as a risk factor in cardiovascular disease. Curr Opin Psychiatry (2015) 29(1): 137.10.1097/YCO.0000000000000217
Yusuf S, et al. INTERHEART Study Investigators. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet. 2004;364:937–952. doi: 10.1016/S0140-6736(04)17018-9.

# WHAT SHOULD THE APPRO

Cardiologist

OB/GYN

Med Onc

Rheumatologist

Psychologist/ Psychiatrist

PCP

**Assess ASCVD Risk**

- Include risk enhancers (family history)
- Consider CACS

**Screen for Sex Spec**

-Adverse Pregnancy Outcomes

-PCOS

-Breast Ca/ Chemo/XRT

-HRT, IVF, Menopause, Functional hypothalmic amenorrhea

**ess Women Predominant Conditions**

-SLE/RA

-Anxiety, Depression

**Personalize for Patient**

# Women's Heart Health Program

*The Women's Heart Health Program provides personalized care for the prevention, early detection and treatment of cardiovascular disease in women.*

- **Clinical**
  - A centralized focus to point out and improve gaps in care and need for specialized care in women's health.
  - A specialized program created to push for **collaboration** and interconnection with other specialties
- **Research**
  - Gender specific research studies
- **Community Partnership**
  - Partner with national organizations to increase awareness
- **Education and Health Literacy**
  - Women specific education materials
  - Community outreach and heart health screenings throughout the year
  - Symposium

## Women's Heart Health

### *Heart Disease Risk Factor Checklist*

Did you know that 90% of women have at least one risk factor for heart disease and that 80% of heart disease is preventable?

A risk factor is anything that increases your chance of getting heart disease, now or sometime in the future. It is important to know about the different types of risk factors.

- ✓ Take a few minutes to answer the following checklist to determine your risk.
- ✓ If you answered "Yes" to at least one risk factor, you'd benefit from seeing a cardiologist.

**Risk factors that CANNOT be changed:**

**Family History**
I have/had a female relative with heart disease *before* age 65. ☐Yes ☐No
I have/had a male relative with heart disease *before* age 55. ☐Yes ☐No

**Age**
I am 55 years or older. ☐Yes ☐No

**Menstrual Cycle**
I had early puberty (before age 12) ☐Yes ☐No
I had early menopause (before age 50) ☐Yes ☐No

**Pregnancy Related Issues**
During one or more pregnancies...
I had gestational diabetes (elevated blood sugar) ☐Yes ☐No
I had problems with high blood pressure. (hypertension during pregnancy, pre-eclampsia, eclampsia) ☐Yes ☐No
I had a preterm delivery (prior to 37 weeks) ☐Yes ☐No

**Breast Cancer Treatment**
I am/was treated for breast cancer with...
chemotherapy ☐Yes ☐No
radiation therapy ☐Yes ☐No

Let us help you find the right cardiologist.

Please Contact:

*Sun State Cardiology*
Phone: (480)-821-3800
Fax: (480)-821-3806
sunstatecardiology@gmail.com

**Rheumatologic Conditions**
I have been diagnosed with:
Rheumatoid Arthritis ☐Yes ☐No
Lupus ☐Yes ☐No
Other rheumatologic conditions ☐Yes ☐No

**Risk factors that CAN be modified by early detection:**

**Blood Pressure**
I am being treated for high blood pressure or ☐Yes ☐No
My blood pressure was 130/80 or higher on two or more occasions ☐Yes ☐No

**Diabetes**
I am being treated for diabetes or ☐Yes ☐No
I have been told my blood sugar is high ☐Yes ☐No

**Cholesterol**
My Cholesterol level:
HDL (good cholesterol) is less than 50 mg/dL [Low] ☐Yes ☐No
LDL (bad cholesterol) is more than 100 mg/dL [High] ☐Yes ☐No
Triglyceride is above 150 mg/dL [High] ☐Yes ☐No

**Weight**
I have a BMI (body mass index) of 25 or more. ☐Yes ☐No
(To calculate your BMI, visit the American Heart Association website at www.heart.org and search BMI calculator)
My waist measurement is over 35 inches ☐Yes ☐No

**Smoking**
I smoke(d) cigarettes or I live or work around people who smoke. ☐Yes ☐No

**Wellness**
I am NOT physically active for at least 30 minutes a day, most days of the week ☐Yes ☐No
I suffer from anxiety, depression ☐Yes ☐No

SUN STATE CARDIOLOGY

References: American Heart Association, heart.org; National Heart Lung & Blood Institute, nhlbi.nih.gov

If you, or a woman you love, is at risk for heart disease or is currently being treated for heart disease, let us help you find the right cardiologist.

First Name:_____ Last Name:_____ Telephone:_____ Email:_____

The Women's Heart Health & Prevention Program provides personalized care that focuses on prevention, early detection and treatment of the number one cause of death in women: cardiovascular disease. Contact *Sun State Cardiology* for more information or to schedule an appointment (480)-821-3800, sunstatecardiology@gmail.com or fax form with your name and best contact information to (480)-821-3806 and we will be in touch with you.

Dignity Health.

#WHVSymposium19

# THANK YOU!

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