Health and Wellness Across a Woman’s Life

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Health and Wellness Across a Woman’s Life

- Women’s health and key life transitions

- Women’s health as a continuum across the life-span

- Does sex matter?
Key Life Transitions

• Reproductive years
  Pre-conception
  Pregnancy
  Inter-conception

• Mid-life—menopause

• Older women
Key Life Transitions: Affordable Care Act

Opportunity for young and middle-aged/near old women (55-64)

• Preventive visits
• Preventive services for women in addition to services recommended by USPSTF
• Focus on decreasing healthcare cost in short and long-term
Windows of Opportunity for Prevention Of Chronic Disease Across the Lifespan

Premorbid History

- Fetal Development
- Birth
- Childhood / Puberty
- Young Adult

Illness Onset & Course

- Adulthood, incl. Pregnancy
- Perimenopause-Menopause
- Older Aging

Primary Prevention

Secondary Prevention & Tertiary Prevention
More Women Die from Heart Disease than Men

Heart Disease Mortality in Women and Men
Absolute Number of Deaths

1 out of 3 American women die from cardiovascular disease

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Cardiovascular Disease
Reproductive Health

- Preeclampsia: 5%
- Gestational Diabetes: 5%
- Preterm delivery: 12%
- Low birthweight: 7%

Cardiovascular Health

2x risk of death
Pregnancy as “Stress Test” for Cardiovascular Disease

- Population with complicated pregnancy, e.g. preeclampsia
- Healthy population
- Threshold for clinical vascular or metabolic disease

Adapted with permission from Sattar, BMJ, 2002
There are 85 million mothers alive in the U.S. today. More than a quarter have a history of pregnancy complications indicative of high CVD risk.
Figure 1. Cohort studies of preeclampsia and future CVD\textsuperscript{1}
CVD Events in Women with Gestational Diabetes

Opportunities for Primary Prevention: Obesity

![Graph showing the relationship between mother's prepregnancy BMI and the probability of gestational diabetes mellitus (GDM).](image)

*Note: BMI is defined as weight in kilograms divided by height in meters squared.*


Kim SY, et al. AJPH. 2010;100:1047-1052
Opportunities for Primary Prevention: Obesity

• If all overweight and obese women (BMI over 25 kg/m2) had GDM risk that was equivalent to that of normal weight women, nearly half of the GDM cases could be prevented.

• Achieving a normal pre-pregnancy weight decreases the risk of Type 2 DM and CVD

• Achieving a normal weight pre-pregnancy decreases the risk of pre-eclampsia, recurrent GDM or hypertension of pregnancy.

Kim SY, et al. AJPH. 2010;100:1047-1052
Opportunities for Primary Prevention: Gaps in Care

Obstetrics ↔ Primary Care

Obesity ↔ Hypertension

Lifestyle
Opportunities for Primary Prevention
Call to Action

• Educate women regarding risks of GDM and pre-eclampsia

• Educate internists and family physicians regarding the risk of GDM and pre-eclampsia
  – Make screening for pregnancy complications part of routine history (Mosca, et al. Circulation. 2011;123)
  – 5% internists ask about pre-eclampsia and 9% counsel on CVD risk for those with a hx of pre-eclampsia (Young, et al. Hypertension and Pregnancy. 2012;31: 50-8.)

• Facilitate the transition from obstetrics care to primary care

• Lifestyle modification will be key and this transition in life may be an opportune moment to capture women and their families.
Opportunities for Primary Prevention: Demonstration Project at BWH

• Embed primary care transition for women with high risk pregnancies in obstetrics practice.

• Partner with non-medical organizations to promote lifestyle change.
  – Still learning how best to achieve engagement in lifestyle modification
  – Need to learn how to best message to women with these disorders of pregnancy
  – Magnitude of benefit of lifestyle modification still to be determines.

• Promoting breast feeding will help to improve cardiometabolic profile
  – Affordable Care Act will cover counseling and supplies
Pregnancy as “Stress Test” for Cardiovascular Disease

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**Targeted screening, lifestyle modification, early treatment**

Adapted with permission from Sattar, BMJ, 2002
Arthritis is the number one cause of morbidity for women

• Arthritis is the number one cause of morbidity in the US

• 33% of women ages 45-54 have doctor diagnosed arthritis

• Over 60% of women over the age of 65 have doctor diagnosed arthritis

• Over age of 50 yrs, women are twice as likely to be diagnosed with osteoarthritis compared with men
Major Cause of Disability: Arthritis

Sex specific prevalence of physician diagnosed arthritis, National Health Interview Survey 2007-2009
Physician Diagnosed Arthritis in the U.S. for Women and Men

Theis KA, et al. J Women’s Health. 2007. 16;4:441

Ambulatory Visits for Arthritis: Men and Women ages ≥ 18 yrs 2002-2004

Women have:
- More frequent anxiety and depression
- More frequent psychological distress
- Less physical activity
Arthritis and Obesity

FIGURE. Age-adjusted* prevalence of doctor-diagnosed arthritis among adults, by sex and body mass index (BMI) category† — National Health Interview Survey, United States, 2007–2009

* Age adjusted to the 2000 U.S. projected adult population, using three age groups: 18–44 years, 45–64 years, and ≥65 years.
† BMI = weight (kg) / height (m²). Categorized as follows: underweight/normal weight (<25.0), overweight (25.0 to <30.0), and obese (≥30.0).
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• Women’s health as a continuum across the life-span

• Does sex matter?
Windows of Opportunity for Prevention Of Chronic Disease Across the Lifespan

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Primary Prevention
Secondary Prevention & Tertiary Prevention
Knee Arthritis in Women

• Women lose patella cartilage at a higher rate than men

• **Worse symptoms:** Women report more symptoms than men with similar radiographic grades

• **Women delay treatment:** Women seek knee replacement at a later stage than men

Theis KA, et al.  *J Women’s Health.* 2007. 16;4:441
Approaches to Prevention of Arthritis

• Improve self-management through education, physical activity, and weight management.
  – Physical activity decreases arthritis and delays disability—only 52% were counseled on physical activity
  – Weight management—only 42% of overweight women with arthritis counseled on wt. loss
  – Only 10% of patients over 18 yrs had arthritis education

• Women delay joint replacement

Theis KA, et al. J Women’s Health. 2007. 16;4:441
Women’s Musculoskeletal Center at BWH

- Interdisciplinary approach to the full range of musculoskeletal disorders, with rheumatology, physiatry, orthopedic surgery, endocrinology, nutrition, physical therapy, and psychiatry.

- Specific interest in osteoarthritis prevention and treatment and research into biology and risk for OA

- Focus on sports— for the athlete and women who want to become active safely

- Physiatry or rehabilitative medicine important

- Understand delay in women who need knee replacement
Sex Does Matter

• Every cell has a sex
• Sex differences in health and disease
• Models of disease not based on women
• Gender plays a significant role
• 1993 NIH Revitalization Act: Congress mandated inclusion of women and minorities in clinical research.
Women’s Health Across the Lifespan
Women’s Health as a Magnifier and Multiplier

• Women remain the primary care givers around the world
  – Women are the doctors, nurses, pharmacists and therapists

• In the U.S., women make over 70% of the healthcare decisions

• Women are demanding consumers of health care
  – Seek more health information, demand more education, press for prevention

• Women are the bearers of the next generation
  – Healthy women produce healthier children

• The health of women is a key indicator of a country’s overall health—economic, education, health
LEGACY
THE BWH FAMILY COHORT STUDY

Seeding medical progress for this generation and generations to come

BRIGHAM AND WOMEN’S HOSPITAL

Connors Center for Women’s Health and Gender Biology
Women’s Health as a Magnifier and Multiplier

1. Women’s health across the lifespan
2. Women’s health across disciplines
   – Research
   – Clinical care
   – Policy and advocacy
   – Leadership/Education
   – Global health
3. Women’s health across the fields in medicine
   – Obstetrics and gynecology, cancer, cardiovascular, neuroscience, orthopedics and arthritis
Metabolic syndrome and OA

• Aberration in triglycerides, HDL
• Hypertension
• Elevated blood glucose
• Elevated BMI

Katz JD, Agrawal S, and Velasquez M, Getting to the heart of the matter: osteoarthritis takes its place as part of the metabolic syndrome. Curr Op Rheum 2010, 22: 512-519
Metabolic syndrome and OA

• Hand osteoarthritis in older women correlates linearly with their degree of atherosclerosis
• Patients with generalized OA have higher vessel wall thickness
• Patients with a first degree relative with htn have a higher risk of developing DISH
Key Life Transitions

• Reproductive years
  – Pre-conception
  – Pregnancy
  – Inter-conception

• Primary Prevention
  • CVD
  • DM
  • Obesity
Opportunities for earlier treatment, novel treatment, tailored treatment

New or targeted treatments tailored to pregnancy history?

Earlier treatment?

Years since pregnancy

Preeclampsia

Normotensive

Figure 4. Incidence of type 2 diabetes up to 35 years after hypertensive v. normotensive first pregnancy
Opportunities for Prevention

New or targeted treatments tailored to pregnancy history?

Earlier treatment?

Years since pregnancy

Failure Rate

0.05 0.1 0.15 0.2 0.25

Preeclampsia
Normotensive
Back slides
Figure 2. Theoretical model associating cardiometabolic risk, hypertensive pregnancy, and CHD events
Figure 1. Cohort studies of preeclampsia and future CHD$^1$
Men & Women Below 100% Poverty, U.S. 2009

Boston, Massachusetts

Healthy Heart Study
Healthy Heart Study: Methods

• Facilitators conducted series of focus groups
  – General eating patterns
  – Healthy alternatives
  – Barriers to healthy eating

• Developed, tested, and revised two sets of culturally-appropriate model 7-day menus
  – Household preferences
  – Preparation
  – Cost
  – Access

• Translated menus into shopping lists

• Conducted cost assessments at large local grocery stores to develop conservative estimates for monthly food cost.
Affordability of a Healthy Diet in Boston: Roxbury

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* Fiscal Year 2004
The Boston Collaborative for Food & Fitness

• Consortium of community organizations, city agencies, city-wide organizations, and two AMC’s to improve access to healthy food and safe environments for active living.

• Kellogg grants to plan and implement a broad and sustainable plan that targets:
  – Community food environments (stores, farmer’s markets)
  – School food systems
  – Active living (e.g. open spaces/sidewalks that are safe)
  – Health care systems that support access to healthy, affordable food
Goals of the Boston Food Policy Council

1. Increase access to affordable, healthy, nutritious food for all Boston residents

2. Expand Boston’s capacity to produce, distribute, and consume local food

3. Promote food as an economic development strategy

4. Expand existing public and private partnerships and establish new partnerships with foundations and corporate leaders
Integration Across Fields: Public Health and Health Care Delivery

Levels of Integration

- Low
- Medium
- High

Public Health

Health Care Delivery

- Physician
- Practice
- Community
- Hospital
- Academic Medical Ctr
- System
Men & Women Below 100% Poverty, U.S. 2004

Men & Women Below 100% Poverty, U.S. 2009

Ideas for Talk

• ? Start with Shocker stats that I used for Board of Advocates
• Use story of mesothelioma as an example of what sex differences in science can look like--- could present lung cancer story—smoking, etc
• Over life course— idea of the family cohort but also what specific questions this raises—
  – Vascular disease and risk in young women
  – Small grant to develop approach to GDM but we need to understand the underlying physiology
  – CVD in women as they age— how do we understand the role of different technologies?
  – Policy— the availability of healthy food-- $25,000 grant
  – Impact of MA HC reform on women— opportunity for more work
    • ASIST
• Leadership and the next generation— who can do this work? We need to prepare clinicians and scientists to think differently—
  – Our work with the Sloan Foundation (Academic Medicine Paper)
  – BIRWCH –
    – Global Women’s Health Fellowship
• Women’s Health Globally— ?work at Harvard
One generation affects the next
HOW EARLY EVENTS PREDICT LATER HEALTH

LEGACY
THE BWH FAMILY COHORT STUDY
THE NEXT GENERATION OF DISCOVERIES

What we can accomplish

A Family Cohort drawn from 8,000 births at BWH, coupled with new technologies and the expertise of BWH scientists, will show:

- Intergenerational pattern(s) of disease—and how to break the cycle
- Environmental exposures in pregnancy and infancy that alter child development and set the stage for adult disease
- How common pregnancy complications predict the future health of the mother, and how this information can help us prevent disease
- Brain and body interactions that produce physical and mental health
- Sex differences in common diseases

LEGACY
THE BWH FAMILY COHORT STUDY