Presentation Overview

- The biomedical model and its legacy
  - Increased life expectancy
  - Mind-body dualism
  - Rise of the pharmaceutical industry
  - Rise in biomedical research

- Limitations of the biomedical model
  - Changing nature of disease
  - Rising health care cost
  - Increasing recognition of role of behavior in health

- A paradigm shift: biomedical to the biopsychosocial model
  - Implications for health care, professional education, and health research
  - Implications for psychology
Biomedical Model: The Basis of Western Medicine

Exposure to pathogen → Biological onset of disease → Symptoms appear → Therapy begun → Diagnosis → ‘Outcomes’ (cured; living with the disease; deteriorated; died) (possible relapse & change in therapy)

http://phprimer.afmc.ca/print_frame.php?action=chapter&node=57965
Biomedical Model

- Focus: Disease
- Reductionistic: Disease is defined by a biologic defect
- Exclusionary: Problems not explained by a biologic defect are excluded
- Mind-body dualism
- Biologic assays, interventions, and research
Success of the Biomedical Model

- Germ theory of disease lead to
  - Sanitation
  - Antibiotics and rise of the pharmaceutical industry
  - Decline in infectious disease
  - Increased life expectancy

- Reductionism lead to
  - Identification and treatment of underlying biologic defect (e.g. insulin replacement in type 1 diabetes)
  - Mapping the human genome
## Success of the Biomedical Model: Elimination of Infectious Disease as the Leading Cause of Death in the United States

<table>
<thead>
<tr>
<th>cause of death</th>
<th>1900</th>
<th>2000</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Tuberculosis</td>
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CDC, National Center for Health Statistics (1900) and National Center for Injury Prevention and Control (1999)
Success of the Biomedical Model: Increasing US Life Expectancy

Source: Kurian (2004, Tables 4-5, p. 71)
Success of the Biomedical Model: Type 1 Diabetes
Life Expectancy in the Pre- and Post-Insulin Era

Dublin, 1951; Brown et al, 2001
Disease is defined as a derangement in an underlying physical mechanism.

Anything not caused by a physical derangement, is excluded.

Mental and physical health are treated separately; unless a behavioral disorder is the consequence of an underlying physical derangement, it is not a disease and therefore excluded.
Biomedical Model’s Legacy for US Health Care: Reductionism, Exclusion, Mind-Body Dualism

- Priority given to diagnosis & treatment of disease
  - Physical complaints are given greater value
  - Resources are devoted to biologic assays, biologic interventions, and biologic research
  - Prevention a lower priority than treatment
- Mental or behavioral problems are excluded/devalued
  - Mental/behavioral problems not considered “real”
  - Mental health services are “carved out”
  - Fewer resources devoted to these services and to mental or behavioral research
Biomedical Model’s Legacy: US Health Expenditures Devoted Primarily to Physical Health

Mental Health Expenditures as a Percent of All Health Care Expenditures (2003)

Mental Health (MH) 6.2%

All Health = $1,614 billion in 2003
MH = $100 billion in 2003

Data courtesy of SAMHSA

Biomedical Model’s Legacy: Rise in the Pharmaceutical Industry

Percent of US Population Using Prescription Drugs and Expenditures in Billions of US Dollars

http://meps.ahrq.gov/mepsweb/data_stats
Biomedical Model’s Legacy: US Mental Health Expenditures for Prescription Drugs in Billions

Mark et al, Health Affairs, 2011
Mental health and physical health providers are trained separately.

Greater resources and prestige is assigned to one type of professional training over the other.

Results in an imbalance in the numbers of well trained (and well paid) providers, strongly favoring physical health.

Within this system, psychologists - experts on behavior, cognition and emotion – are “mental health” and physicians are the “physical health” providers.
Biomedical Model’s Legacy: Rise in Federal Funding for Biomedical Research


Obligations in billions of constant FY 2008 dollars

- NIH biomedical research
- Engineering
- Physical Sciences
- All other life sciences
- Environmental Sciences
- Math / Computer Sciences
- Social Sciences
- Psychology
- Other

* - Other includes research not classified

Biomedical Model’s Legacy: Rise in Cognitive, Affective, Behavioral and Social Neuroscience

- **Journal of Cognitive Neuroscience (1989):** “investigates brain-behavior interaction and ...developments in neuroscience, neuropsychology, cognitive psychology, neurobiology, linguistics, computer science, and philosophy.”

- **Cognitive, Affective, & Behavioral Neuroscience (2001):** “the leading vehicle for strongly psychologically motivated studies of brain-behavior relationships.”

- **Social Neuroscience (2006):** “examines how the brain mediates social cognition, interpersonal exchanges, affective/cognitive group interactions, and related topics that deal with social/personality psychology.”

- **Social, Cognitive and Affective Neuroscience (2009):** “addresses issues of mental and physical health as they relate to social and affective processes as long as cognitive neuroscience methods are used.”

- **Cognitive Neuroscience (2010):** “publishes papers on any topic in the field of cognitive neuroscience including: perception, attention, memory, language, action, decision-making, emotions, and social cognition.”
Division of Neuroscience and Basic Behavioral Science established at the National Institute of Mental Health (1997): priority areas include: “how cognitive, affect, stress, and motivational processes interact and their role(s) in mental disorders through functional studies spanning levels of analysis (genomic, molecular, cellular, circuits, behavior) during development and throughout the lifespan” and “fundamental mechanisms (e.g., genetic, biological, behavioral, environmental) of complex social behavior.”

Cognitive Neuroscience Program established at National Science Foundation (2002): funds “interdisciplinary proposals aimed at advancing a rigorous understanding of how the human brain supports thought, perception, affect, action, social processes, and other aspects of cognition and behavior”
Despite the success of the biomedical model, by the end of the 20th century, heath care and research was on the verge of a paradigm shift as a result of:

- Changing nature of disease
- Rising health care costs
- Increasing recognition of role of patient and provider behavior

This in turn lead to the introduction of the biopsychosocial model
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CDC, National Center for Health Statistics (1900) and National Center for Injury Prevention and Control (1999)
7 of 10 US deaths are the result of chronic disease

In 2005, 133 million Americans – almost 1 in 2 adults – had at least one chronic illness

One quarter of those with a chronic illness have a major activity limitation

Chronic diseases account for 75% - $1.9 trillion- of the nation’s healthcare costs

Rising Health Costs

US Dollars Spent Per Person on Health Care by Year

US Leads the World in Health Care Costs with Lower Life Expectancy

http://ucatlas.ucsc.edu/health/accessprint.html
### Increasing Recognition of the Role of Behavior

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<td>Tobacco</td>
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<tr>
<td>2</td>
<td>Cancer</td>
<td>Diet/Activity</td>
</tr>
<tr>
<td>3</td>
<td>Stroke</td>
<td>Alcohol</td>
</tr>
<tr>
<td>4</td>
<td>Pulmonary Disease</td>
<td>Microbial Agents</td>
</tr>
<tr>
<td>5</td>
<td>Accidents</td>
<td>Toxic Agents</td>
</tr>
<tr>
<td>6</td>
<td>Diabetes</td>
<td>Motor Vehicles</td>
</tr>
<tr>
<td>7</td>
<td>Pneumonia/Influenza</td>
<td>Firearms</td>
</tr>
<tr>
<td>8</td>
<td>Alzheimer’s</td>
<td>Sexual Behavior</td>
</tr>
<tr>
<td>9</td>
<td>Kidney disease</td>
<td>Illicit Drug Use</td>
</tr>
</tbody>
</table>

*JAMA. 2004;291:1238-1245*
### Increasing Recognition of the Role of Behavior: Determinants of Health

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Access to Care</td>
<td>10%</td>
</tr>
<tr>
<td>Genetics</td>
<td>20%</td>
</tr>
<tr>
<td>Environment</td>
<td>20%</td>
</tr>
<tr>
<td>Health Behaviors</td>
<td>50%</td>
</tr>
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</table>

CDC, 2010
Increasing Recognition of Role of Behavior: Reports of the US Surgeon General

www.surgeongeneral.gov/sgoffice.htm

- 1964 - 2012 there have been 37 reports on Smoking and Health
- 1972 Impact of Television Violence
- 1979 Healthy People: leading to Healthy People 1990, 2000, 2010, and 2020 – all focus on behavioral aspects of health promotion and disease prevention
- 1988 Report on Nutrition and Health
- 1992 HIV Infection and AIDS
- 1996 Physical Activity and Health
- 1999 and 2001 Mental Health
- 2001 Youth Violence
- 2001 Call to Action to Prevent and Decrease Overweight and Obesity
Increasing Recognition of the Role of Behavior: Healthy People Reports

- Healthy People 1990: Promoting Health/Preventing Disease: Objectives for the Nation
- Healthy People 2000: National Health Promotion and Disease Prevention Objectives
- Healthy People 2010: Objectives for Improving Health
- Healthy People 2020 focus: Four overarching objectives - health status; quality of life, social determinants of health, and disparities
Increasing Recognition of Role of Behavior: Institute of Medicine (IOM) Reports

- Promoting Health: Intervention Strategies from Social and Behavioral Research (2000)
- Health and Behavior: The Interplay of Biological, Behavioral, and Societal Influences (2001)
Increasing Recognition of Role of Behavior

- Disease etiology
- Disease prevention
- Disease management
  - ~ 30% of patients fail to adhere to short-term regimens
  - ~ 50% of patients fail to adhere to long-term regimens
  - ~ 70% of patients fail to comply when asymptomatic
  - ~ 75% of patients have difficulty making lifestyle changes
  - Chronic disease requires long-term often complex medical regimens; many require lifestyle changes
  - Poor medical regimen adherence associated with increased health care costs

Clinical Therapeutics, 2000, 22:858-871; Johnson, Psychosocial clinical guidelines for the care of patients with diabetes, 2012
Establishment of Office of Behavioral and Social Science Research at NIH (1995)

Human Genome Project:
  • Establishment of the Office of Ethical, Legal, and Social Implications of Human Genetics Research (1990)
  • Failure of genetic determinism and increased recognition that the environment, including human behavior, plays a large role in genetic expression
Increasing Recognition of the Role of Behavior: Provider Behavior is Important Too!

- Providers often fail to communicate successfully with their patients
- Doctors make mistakes!
  - Institute of Medicine report: To Err is Human: Building a Safer Health Care System (1999): medical errors are the 8th leading cause of death in the US
  - >50% of medical recommendations are inappropriate

Medicine’s Paradigm Shift to the Biopsychosocial Model

Biomedical model indicated in red
Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946

<table>
<thead>
<tr>
<th>Biomedical</th>
<th>Biopsychosocial</th>
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<tbody>
<tr>
<td><strong>Focus:</strong> Disease</td>
<td><strong>Focus:</strong> Well-being</td>
</tr>
<tr>
<td>Reductionism – disease is defined by a single biologic defect</td>
<td>Multi-factorial – well-being is a product of multiple factors</td>
</tr>
<tr>
<td>Dualism – mind and body are separate</td>
<td>Integrative – mind and body are not separate</td>
</tr>
<tr>
<td>Biologic assays and treatments emphasized</td>
<td>Treatments may be behavioral, biologic, or environmental</td>
</tr>
<tr>
<td></td>
<td>Prevention is a focus</td>
</tr>
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</table>
Patient-centered integrated care:
- Mind-body dualism is abandoned
- The patient is viewed as a whole person
- All of the patient’s needs are addressed
- By inter-professional health care teams
- That include health and mental health expertise
- In a non-stigmatizing environment that considers the patient’s preferences and culture
Biopsychosocial Model: Implications for US Health Care

- Increased emphasis on disease prevention
- Increased emphasis on functioning and quality of life as health outcomes
- Use of multiple intervention options, including behavioral interventions
  - US Preventives Services Task Force recommendations:
    - Screening and Behavioral Counseling Interventions in Primary Care to Reduce Alcohol Misuse (2004)
    - Counseling and Interventions to Prevent Tobacco Use and Tobacco-Caused Disease in Adults and Pregnant Women (2009)
    - Screening for and Management of Obesity in Children (2010)
    - Behavioral Counseling to Prevent Skin Cancer (2012)
    - Screening for and Management of Obesity in Adults (2012)

http://www.uspreventiveservicestaskforce.org; www.pcori.org
Biopsychosocial Model: Implications for Health Providers

- Science-based Health Care
  - Health care practice is based on science
- Practice Guidelines
  - Professional, national, governmental agencies
- Medical Informatics
  - a science addressing how best to use information to improve health care; National Library of Medicine is the government leader (www.nlm.nih.gov)
- Patient Safety Initiatives
  - Electronic medical record
  - Decision support systems
Affordable Care Act is Consistent with the Biopsychosocial Model

- Essential health benefits include mental health, preventive and wellness services, and chronic disease management
  - US Preventive Services Task Force (A and B) recommendations must be covered with no cost sharing
- Emphasizes patient-centered coordinated care, patient safety, reduction of medical errors, reduction in health disparities
- Emphasizes patient functioning and quality of life as health outcomes
  - Established the Patient-Centered Outcomes Research Institute (PCORI) which focuses on “outcomes that people notice and care about such as survival, function, symptoms, and health related quality of life”

Biopsychosocial Model:
Implications for Health Provider Education

- Increased behavioral science in medical education
  - MCAT will have an increased focus on behavioral and social sciences (https://www.aamc.org/newsroom/newsreleases/273712/120216.html)
  - Focus on patient-centered care (http://www.lcme.org/pubs.htm)
    - Patient-provider communication skills
    - Medical impact of common societal problems
    - Impact of patient culture and beliefs
    - Impact of provider bias and beliefs

- Increased training in inter-professional practice: Core Competencies for Interprofessional Collaborative Practice adopted by six professional organizations (medicine, nursing, osteopathy, dentistry, pharmacy, public health) (http://www.aacn.nche.edu/education-resources/ipecreport.pdf)
Biopsychosocial Model: Implications for Health Research

- Increased patient satisfaction, functioning and quality of life as health outcomes
- Increased focus on a wider variety of treatment options, including behavioral options
- Increased focus on cost-effectiveness
- Increased focus on interdisciplinary sciences such as:
  - Epigentics
  - Pharmacogentics
  - Personalized medicine
- Increased focus on translation research and implementation science
US National Institutes of Health: Funding for Multi- or Interdisciplinary Science

Number of grants

Funding in millions

http://projectreporter.nih.gov/reporter.cfm
Biopsychosocial Model: Opportunities for Psychology

- The model is consistent with psychology’s
  - Multivariate conceptual heritage
  - Scientific and methodological expertise
- Many psychologists have been early adopters and leaders in its development & application
  - Many are health, pediatric, rehabilitation, neuro-, or gero- psychologists
  - Many work in primary care, public health, social cognitive or affective neuroscience, behavioral genetics, psychoneuroimmunology, medical decision-making, bioethics
  - Three of the first four Directors of OBSSR are psychologists
The impact of the mind-body dualism of the biomedical model on psychology has been profound, resulting in

- an overly narrow focus on mental health
- education silos producing
  - solo practitioners
  - solo scientists
Biopsychosocial Model: Challenges for Psychological Practice

- Reduction in mental health delivery by independent practitioners providing services in isolation
- Increased practice on health care teams in larger group practices and institutional settings
- Increased demand for expertise in a wide array of behavior issues in addition to “mental health” (e.g., compliance, pain management, coping with disability, life style behavior change)
Biopsychosocial Model: Challenges for Psychological Practice

- Need to adapt to the larger health care culture
  - Evidence-based practice
  - Treatment guidelines
  - Electronic health records

- Need for increased collaboration with a wide range of health providers and organizations
  - To develop new payment models for patient-centered integrated care
  - Treatment guidelines
The really hard scientific questions can no longer be answered by a single discipline.

Health research is now conducted primarily by interdisciplinary teams.

Our psychology graduate training, hiring and tenure and promotion practices are based on solo science that:

- Values first and single author publications/funding
- Discourages cross-discipline hiring
Biopsychosocial Model: Challenges for Graduate Education in Psychology

- Professional psychologists must be educated to:
  - function as health providers - not just mental health providers,
  - delivering patient-centered care,
  - on interprofessional teams

- Research psychologists must be educated to:
  - function on interdisciplinary science teams
  - address psychological science relevant to a wide array of interdisciplinary science: epigenetics, psychoneuroimmunology, personalized medicine, clinical trials, & dissemination science
Biopsychosocial Model: Opportunities and Challenges for APA

- APA policy
- Strategic planning and initiatives
- Education and training
- Advocacy for professional practice
APA Policy

- 1996: Recognition as Health Service Providers
- 1999: Changing U.S. Health Care System
- 2000: Criteria for Evaluating Treatment Guidelines
- 2003: Health Service Psychologists as Primary Health Care Providers
- 2005: Evidence Based Practice in Psychology Health Care for the Whole Person
- 2007: Principles on Health Care Reform
- 201?: First treatment guidelines ever done by APA (on depression)
- 201?: Second treatment guidelines ever done by APA (on obesity)
Maximize Organizational Effectiveness
Expand Psychology’s Role in Health
Increase Recognition of Psychology as a Science
APA Initiatives

- Psychology Workforce Analysis
  - Workforce needs very different if psychology is seen as a health vs mental health profession

- Treatment Guidelines
  - To assure all providers and patients have access to all evidence-based interventions, not just biologic interventions

- Public Education
  - To assure the public views psychology as critical to health not just mental health
  - Stress in America campaign: emphasizes the link between stress and health

**Education and Training**

- Graduate Psychology Education (GPE) legislation established psychology as a health profession within the federal Bureau of Health Professions (2001)
- Task Force on Primary Care Training
- Health Service Provider competencies identified
- Competencies for Psychological Practice in Primary care Inter-organizational Workgroup
- CE and track programming on inter-professional practice, interdisciplinary science, and obesity
APA Initiatives

- Forge Inter-organizational Strategic Alliances
  - APA membership on the Executive Committee of the Patient-Centered Primary Care Collaborative (PCPCC)
  - Competencies for Psychological Practice in Primary care Inter-organizational Workgroup
  - APA –Association of Black Psychologists Summit on Obesity in African American Women and Girls
  - Council of Scientific Society Presidents Initiative on Interdisciplinary Science
  - More to come….
APA/APAPO Advocacy for Professional Practice

- Supporting legislation to include psychologists as “meaningful users” of electronic health records so they are eligible for financial incentives for EHR adoption
- Supporting legislation to include psychologists in the physician definition of Medicare
- Working with state psychological associations to remove legal and regulatory barriers to psychologists’ participation in multi-disciplinary practices
- Developed Health and Behavior CPT Codes (2000): currently recognized by Medicare, many private carriers, some Medicaid plans but much more needs to be done
Increasing Psychology’s Role in Health Research and Health Care

- Psychology faces unprecedented opportunities in health research and health care
- To take advantage of these opportunities, professional and scientific psychology must abandon the mind-body dualism of the biomedical model and fully embrace the biopsychosocial model
- If psychology does not, others will fill the gap – a significant loss for
  - psychology
  - patient care
  - health research