Emory Predictive Health

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Emory Predictive Health

the concept
• 2006 : 2.2 trillion dollars were spent on healthcare (or 7,129 dollars a person).
• Diabetes treatment is an estimated $20 billion industry.
• The average 65 year old couple without health coverage through a previous employer is estimated to need $215,000 for healthcare costs.

• The best disease care system may not be the best health care system.
Predictive Health Goals

Develop a quantitative positive definition of health that will enable health surveillance, risk assessment and premorbid diagnosis.

Discover new interventions at the earliest stages of deviation from health that will restore the healthy state at the time when that is likely to be most feasible.

Determine how best to translate discovery to society in an ethically sound framework.

Redefine disease as a medical failure.
Crisis and Repair vs Predict and Preempt

• The present medical model is constructed around treating disease intervention. It is after the fact, often of limited efficacy and expensive.
  – What’s wrong? Let’s fix it if we can…

• Predictive health seeks to recognize factors that influence onset of disease and identify preemptive solutions.
  – What’s right? What can we do to ensure that it stays that way…
Paradigm Shift:

The Health/Disease Continuum

- Normal Low risk
- Normal High risk
- Pre disease
- Early disease
- Late disease

Predictive Health

Contemporary Medicine
Predicting Health

Family History
Genetics

Cardiovascular disease
Diabetes
Neurodegenerative disease
Psychiatric disorders
Cancer
Genetics is not the whole tale

The kinky mouse lessons: Epigenetics
Emory Predictive Health

• *Discovery-based:* There are a limited number of *generic biological processes* that function to maintain the healthy state of the body:

  - Oxidative Stress
  - Inflammation
  - Immune Health
  - Regenerative Potential

• Detectable alterations in these processes can predict essentially all human diseases before organ function is affected.
Generic Processes in Health & Disease

• The Goldilocks Principle
  – Not too little, not too much, just enough

• What farmers and others know…
Inflammation & Depression

Markers of inflammation in the blood are documented to rise in response to stress.

Studies have identified these to be higher among depressed individuals.

What is the nature of the depression-inflammation link?

"There's always some collateral damage when the immune system gets fired up, and we now believe that too much inflammation, either at rest or during stress, may predispose people to become depressed or stay depressed."

– Andrew Miller, M.D
Aging and Immune Health

- From 50 years of age, the immune system shows signs of deterioration.
- Infections, cancer and acquired inflammatory syndromes, coronary artery disease, increase.
- How does the immune system age?
- How can immune aging be slowed down?
- Autoimmune diseases (lupus, RA) associated with premature loss of telomeres.

Cornelia Weyand, M.D.
Developmental Origins of Health

Birth weight & Size
Prematurity
Early Growth Rates

Cardiovascular Disease
Diabetes
Metabolic Syndrome
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The Center for Health Discovery
Emory Predictive Health

The Institute
Emory Predictive Health Collaboration with Georgia Tech
Apply what we know, translate new discovery

**Predictive Health Institute**

**Center for Health Discovery and Well Being**
- Health assessment
- Personalized health plan
- Clinical/translational research

**Biomarker Science Discovery And Validation**
- genomics
- proteomics
- metabolomics
- structural biology
- computational science

“The Predictive Health Institute will integrate science, technology and education with personalized healthcare, and will pioneer strategies to translate Predictive Health into ethical, economically and socially feasible practice for the benefit of humanity”
Emory Predictive Health

The Future of Health Care
Predicting Health: Challenges, Systemic Implications

- 21st century health care
  - Traditional disease treatment
  - Predictive approaches
- Education
  - General public
  - Health care professionals
- Economics
  - Government
  - Insurers
- Information technology

Philadelphia Inquirer