Fighting Cancer with Data: Perspectives on MD Anderson Moon Shot Program

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The Moon Shots Program

“Is there knowledge in hand today that, if fully applied, would accelerate declines in cancer mortality in the next 5 to 10 years?”

Ronald A. DePinho, M.D., 2012

Guiding principles:

• Interdisciplinary teams focused on full translation of current knowledge
• Identify prevention, early detection, and treatment opportunities that would be enabled by adequate funding and by professional platforms
The Moon Shots Program

Goal-oriented multi-disciplinary effort harnessing available knowledge and new disruptive technologies to dramatically reduce cancer mortality through prevention, early detection and curative treatments

First Six Moon Shots

- Leukemia – MDS/AML
- Leukemia – CLL
- Prostate cancer
- Melanoma
- Lung cancer
- Breast and Ovarian cancer

Six New Moon Shots

- Glioblastoma
- Pancreatic cancer
- HPV-associated cancers
- Colorectal cancer
- B-cell Lymphoma
- Multiple Myeloma
Moon Shots Platforms

Professional teams and robust infrastructure focused on the conversion of actionable knowledge into clinical endpoints

- Cancer Prevention and Control
- APOLLO and Big Data
  - Cancer Genomics Laboratory (CGL)
  - Proteomics
  - Immunotherapy
- Institute for Applied Cancer Science
- Oncology Research for Biologics and Immunotherapy Translation (ORBIT)
- Applied Cellular Therapy
- Center for Co-Clinical Trials
Framework for public health action: Interventions focusing on lower levels of the pyramid tend to have a broader reach.

- **Socioeconomic Factors**
  - **Changing the Context**
    - to make individuals’ default decisions healthy
  - **Long-lasting Protective Interventions**
  - **Clinical Interventions**
  - **Counseling, Education**

Increasing population impact

Increasing individual effort needed
The Platform leads transformational prevention and early detection initiatives in partnership with the Moon Shots Program

**Evidence-Based Interventions**
- Policy
- Public & Professional Education
- Community-Based Clinical Services

**Population-Level Focus**
- Institutional
- Local/Regional/State
- National / International

**Vision:** To be the leader in cancer prevention, control, and early detection, targeting decreased burden of cancer in the US and world by translating science into policy and disseminating knowledge and services

**Mission:** To accelerate the development, dissemination, and amplification of evidence-based strategies, community services, policy interventions, and knowledge targeting measurable reductions in cancer incidence and mortality at a population level
The current health care system: areas for improvement in chronic disease management and control

• More than $1 trillion in US health care expenditures are considered “wasteful”
  o **Inefficiency** with lack of connectivity in a provider-centric system
  o **Knowledge disparity** with suboptimal care due to widening gaps between what-is-possible and what-is-practiced
  o **Lack of access** to basic primary care and preventative services

• Parallel public health system that is generic rather than personalized, managing most of the population with “one-size-fits-all” approaches

Current Population Health Model:
Healthcare 2.0: predictive analytics can be used to tailor health services to meet individual needs

- A system that can integrate all of these health services and organize them around the patients and consumers
- A system that tailors health services to an individual based on predictive analytics, which tracks longitudinally the health status, incorporating clinical, behavioral and social determinants of health

New Health Intervention Model:

- **Behavioral Determinants**
  - Literacy
  - Activation status

- **Physiological Determinants**
  - Epi/Genetics
  - Clinical phenotypes

- **Social Determinants**
  - Economic
  - Environmental

**Predictive Analytics**

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**Birth**

**Preventive Services**

**Screening Services**

**Diagnosis**

**Treatment**

**Response**

**Outcome**

**Predictive Analytics**

**Predictive Analytics**
Questions?

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