Building on our past, we are poised to once again change the way medicine is practiced.

Variability is the law of life, and as no two faces are the same, so... no two individuals react alike and behave alike under the abnormal conditions which we know as disease. – William Osler
Hopkins *inHealth* – *intelligent use of information to better “subset” and treat patients*

- Explain meaningful variation by:
  - **Novel measurements**
  - **Novel analysis** of existing data

- Identify subsets of patients and optimal treatments for each group

- Develop and disseminate tools for others to follow
Novel Measurements

AR-V7 and Resistance to Enzalutamide and Abiraterone in Prostate Cancer

Emmanuel S. Antonarakis, M.D., Changxue Lu, Ph.D., Hao Wang, Ph.D., Brandon Luber, Sc.M., Mary Nakazawa, M.H.S., Jeffrey C. Roeser, B.S., Yan Chen, Ph.D., Tabrez A. Mohammad, Ph.D., Yidong Chen, Ph.D., Helen L. Fedor, B.S., Tamara L. Lotan, M.D., Qizhi Zheng, M.D., Angelo M. De Marzo, M.D., Ph.D., John T. Isaacs, Ph.D., William B. Isaacs, Ph.D., Rosa Nadal, M.D., Channing J. Paller, M.D., Samuel R. Denmeade, M.D., Michael A. Carducci, M.D., Mario A. Eisenberger, M.D., and Jun Luo, Ph.D.
Automated plan resulted in 30% reduction in dose to parotids
To support your faculty, Hopkins inHealth can:

1. Consult on best design and implementation of your faculty’s inHealth projects

   *bioethics, data, statistics, project management, business models, and dissemination*

2. Match start-up funds; leverage other sources of investment

3. Support grant writing

4. Disseminate ideas, methods, new tools and success stories  
   [http://hopkinsinhealth.jhu.edu/](http://hopkinsinhealth.jhu.edu/)
Follow-up for Departments to Get Involved

1. *in*Health leadership visit to your department to identify potential *in*Health projects to address unmet medical needs

2. Contribute $150K to support 3 pilot *in*Health projects within your department

3. Appoint *in*Health Steering Committee member

4. Encourage faculty to join *in*Health to compete for pilot funding [http://hopkinsinhealth.jhu.edu/](http://hopkinsinhealth.jhu.edu/)
Thank You
Extra Slides
Building on our past, we are poised to again change the way medicine is practiced
JHM as a leading academic health center

Transforming From Centers of Learning to Learning Health Systems
The Challenge for Academic Health Centers

Health care organizations face intensifying pressure to achieve the triple aims of better patient experience, better health, and affordability. Although all health systems grapple with these imperatives, the tripartite mission of research, education, and patient care presents particular challenges for academic health centers in responding to demands for high-value, patient-centered care and population health. In this Viewpoint, we propose that health reform offers an opportunity for academic health centers to create new synergies across mission areas to become exemplary learning health systems.

Tensions Between Mission Areas
Clinically oriented constituents at academic health centers are concerned that patient care is subservient to the other 2 mission areas, often sensing that clinical operations are valued less for their success in meeting needs who voice concern that clinical operations already do not adequately accommodate the other academic missions. They are apprehensive that the clinical enterprise’s heightened attention to customer service, productivity, and affordability will imperil the educational and research missions. At the same time, many members of these constituencies acknowledge that academic health centers cannot truly teach high-quality medicine without consistently practicing great medicine, or excel in scientific discovery without discovering how to make their patient care services reliably excellent.

The Learning Health System
Academic health centers should replace the concept of a tripartite mission with a commitment to a single mission: the improvement of health and health care through
# Survey of Unmet Medical Needs

<table>
<thead>
<tr>
<th>Unmet Medical Needs</th>
<th>Novel Measurements</th>
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<tr>
<td>More effective cancer screening</td>
<td>Biomarker discovery</td>
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<td>Better prediction of patient outcomes</td>
<td>• Genetics</td>
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<tr>
<td>• Myocardial infarction/heart failure</td>
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<td>• Kidney disease</td>
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<td>• Impact of gender/sex</td>
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<tr>
<td>More individualized patient care</td>
<td>• Based on genotype/phenotype associations</td>
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<tr>
<td>• Drug/dosing for transplant patients</td>
<td></td>
</tr>
<tr>
<td>• Targeted therapies</td>
<td></td>
</tr>
</tbody>
</table>

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## Survey of Unmet Medical Needs

### Novel Analytics

- Predictive modeling
  - Incorporating genotype/phenotype
- Integrated databases
  - Animal models
  - Tissue banks
  - Clinical data
  - Genetic data
  - Financial systems
- Relevant patient populations
  - Priority Partners
  - JHHC
  - Pregnant women

### Necessary Support

- Data analysis expertise/core
- Adequate workforce
- Collaborations across disciplines
- Database development
- Tissue bank development
- Development of EPIC for research purposes
- Bioinformatics support
  - Genotyping
  - Image mining
  - Induced pluripotent stem cell core

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