WISER
Engineering the Evaluation of Online Applications

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Research Institute
“wield technology's wonders to raise health care's quality and lower its cost”
Barack Obama, 1/2009

“FDA outlines oversight of mobile medical applications”
FDA news release, 7/2011
Topics to cover

Case for e-interventions and their evaluation
Center for Injury Research and Prevention
WISER@CHOP
Next steps - NSF AIR Grant
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Advantages of Online Health/Wellness

Potential to overcome barriers:

Access
Delays
Lack of continuity
Lack of providers
Cost
Tech evolution of healthcare

Information age health care

Cybermedicine

Prevention and self help

Industrial age medicine

Telemedicine

Self care

Ambulatory medicine

Assisted care

Hospital medicine

Disease management

Clinical medicine

Recent advances

Consumer health informatics
Opportunities for online health and wellness

Opportunities

• Online health promotion/injury prevention
  • 8 in 10 internet users learn about their health online

• Online disease management
  • Estimated $750 million industry

• Online training & continuing education of health care providers
  • Within 7 years, 50% of CME will be online

• Online employee training / resources
  • Corporate interest in promoting health, well-being, safety of employees (and their dependents)
  • Affordable Care Act will require more of this by 2014
Key question

Does it work?

Does it produce the outcomes it is intended to achieve?

(increase specific knowledge or skills leading to a specific behavior)
Another key question

Is it cost-effective?

What is the most efficient way to produce intended outcomes?
(financial cost, participant time)
100 years ago

1900: most diseases viewed as
   – Part of childhood and many children died
   – Only role for medicine: supportive care

2011: rigorous science has changed view of many diseases
   – Translation of foundational science into prevention (vaccines) and treatment (medication and therapy)
   – Rigorous research trials determined effectiveness/cost-effectiveness
How do we answer key questions? Clinical trials of e- or m-interventions

Key elements needed to conduct e- or m-intervention clinical trials:

- Test hypotheses (test mechanism of action, compare “doses” / alternate approaches)
- Collect metrics for process and outcome(s)
- Enroll sufficient number of eligible participants
- Deliver intervention / program (timing, order, progression through stages)
- Manage study (e.g. how participants are assigned to conditions)
- Collect participant intake, interim and outcome data
- Ensure safety (may pre-determine stopping points or red flags)
- Adhere to Regulations/Protections/Privacy
Key barrier

No current system integrates all of these elements to support rigorous evaluation of online learning / training
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Center for Injury Research and Prevention Center of Emphasis at CHOP

Mission: Advance safety of children, adolescents and young adults through research

- Epidemiology / Biostatistics
  - Identify hazards & evaluate
- Engineering
  - Study causes & safety
- Behavioral Science
  - Human/social factors
- Outreach and Advocacy
  - Promote safety
  - E-dissemination strategy
Reframe Injury
Think Prevention

1 Prevent the **crash**
   (think teen driver crash prevention)

2 Prevent the **injury**
   (think occupant protection)

3 Prevent the **complications**
   (think post-crash care)

CIRP develops/evaluates/disseminates
e-interventions in all phases
Center for Injury Research and Prevention

Peer-reviewed, academic research
Translational research
AND
Involvement of end-users
Broad dissemination
Long history of industry and government collaboration
Large network of research & outreach collaborators

Need to ensure that our e-interventions work
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Next steps - NSF AIR Grant
Web-enabled Interactive System for Evaluation Research (WISER@CHOP)

Web-enabled software system platform for the delivery of online applications and conduct of rigorous research based on these applications.

- Secure and confidential
- Robust testing of online applications
  - Implement study design & human subjects research req’s
  - User experience & user compliance
  - Effectiveness in achieving education or training goals
- Short- and long-term outcomes
WISER Development Process
Agile software system development

1. Iterative design
2. Working prototype
3. Component testing
4. Deployment
5. Performance evaluation
6. Refinement, improvement, and further development

1. Interaction over process
2. Working software over comprehensive documentation
3. Collaboration over contract negotiation
4. Responding to change/needs over following a strict plan
Summary

Proof of concept complete:
WISER supported testing of e-intervention

Agile software system development will allow us to continue iterative design implementation, testing, and refinement/improvement to meet needs...
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Next steps – NSF AIR Grant
VISION: Strengthen the US innovation ecosystem and create a healthy society by: (1) Commercializing a new, general-purpose software platform as industry standard & (2) Equipping the region as an “technology cluster”.

AIR PROJECT OBJECTIVE: Innovation Ecosystem will determine & implement necessary market-driven adaptations of new CChIPS technological breakthrough as adaptive tool for evaluation of online health apps.

**Inputs**
- Financial Resources
- Research/Tech/ Business Resources/Expertise Space
- Partners: CAC, UCSC
- Investor: State Farm Insurance
- Stakeholder Panel: Univ., Developers, Vendors Coprs, Healthcare, Gov’t,
- Lead Staff: 4 PhD’s; Business Developer; and Coordinator
- Support Staff: Coordinator, Students

**Activities**
- Activity 1: Ecosystem Structure
- Activity 2: Translational Research
- Activity 3: Technical Advances
- Activity 4: Ecosystem Future Planning
- Activity 5: Training

**AIR Project Results**
- IWERS and online app commercialized
- Rigorous eval conducted
- Refactor analysis
- IWERS functions built
- Business model
- Recs: IWERS as standard
- Ecosystem structure
- New investors
- Stakeholder Panel active
- Students trained

**Innovation Acceleration Outcomes**
- Accelerate commercialization through enabling evaluation
- Develop a network of connections
- Create jobs as a result of the innovation ecosystem
- Prepare students who understand innovation and entrepreneurship
THANK YOU

Please let us know how we can work together to create an

Online Health and Wellness Innovation Ecosystem.