Challenges & Promises of digital biomarkers in the quantification of motor function

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Technology is Changing Fast
Example: The evolution of finger tapping
Venture funding of digital health continues to significantly outpace traditional healthcare sectors.

Source: PwC MoneyTree, digital health data based on Rock Health analysis
Note: Digital health only includes deals>$2M
Opportunities with Chronic Disease Management

As care shifts from episodic to continuous, there is tremendous opportunity to support the management of chronic diseases for all participants:

• **Patient**
  – Engagement (real time visualization), empowerment (intelligent automated interventions), and accountability (self care) to increase adherence and improve outcomes.

• **Payer**
  – Patient self-management and continuous monitoring increases adherence, reduces costs, and improves outcomes.

• **Pharma/Tech Industry**
  – New products
  – Patient behavior data provide insights that inform R&D and Marketing.
  – Med adherence

• **Physician/Care Team**
  – Continuous care data enables exception-based alerts.
  – Better manage the complexity of communication among the care team; keep track of
  – what everyone on the care team is doing.

• **Research (next slide)**
The adoption of technology creates new opportunity in clinical research

- Greater accuracy, sensitivity of collected data/efficacy measure
- Enables much richer data sets through the addition of more contextual information
- Improved protocol patient compliance, less missing data, out of window events
- Greater flexibility with user inputs (participants have more choice over input devices)
- A new avenue to connect with Investigators, study personnel and subjects
- Real-time quality tracking
- Decrease in-person clinic visits, while maintaining high quality care and engagement
- Reduce study costs
- Enable new type of research protocols if combined with eVisits
Proposed Roadmap – Long term objectives for HD

- Quantify symptoms even in prodromal disease stages
- Longitudinally monitor for phenoconversion
- Identify new disease phenotypes
- Monitor disease progression
- Increase adherence-compliance
- Personalize treatments
- Speed trials and reduce cost
- Closed loop therapeutics

Validated solutions will eventually improve the quality of care and could be deployed in real-world settings
Challenges

• Open loop capture of isolated data – lack of actionable data and multi modal recordings
• Multiplicity of solutions - interchangeability
• Discrepancies with established measures
• Correlation with clinical significance
• High burden to value ratio (ie battery life and complexity in UI)
• Regulatory challenges
• Analytics limitations
• Privacy regulations
More Challenges

• Access to technology
• Lexicon of common terms
• Version control management
• Business case/reimbursement: who will pay for technology?
• Globalization
THANK YOU!

"This really is an innovative approach, but I'm afraid we can't consider it. It's never been done before."