E-Mental Health: Measurement, Mental Health and Information Technology

Mental Health Network Conference Annual Conference and Exhibition 2012
London, UK
8 November 2012
Today

- Trends occurring in all of healthcare
- Provider-centric model to a consumer-centric model
- “Big Data” in healthcare
- Consumer recovery movement vs. research in clinical practice
Why Change?

The reason organizations fail is the “assumptions on which the organization has been run no longer fit reality.”

Peter Drucker

The End of Delegation? Information Technology and the CEO. HBR Perspectives Sept-Oct 1995 Reprint Number 95505
The Future
More than any other time in history, mankind faces a crossroads.
One path leads to despair and utter hopelessness.
The other, to total extinction.
Let us pray we have the wisdom to choose correctly.

Woody Allen
Introduction to Netsmart

WHO ARE THESE GUYS?
Netsmart at a Glance

- Founded in 1968
- Largest healthcare IT company serving Health and Human Services sector
  - 42 state systems; 18,000 providers
  - 1,000+ clinics, hospitals
  - Serving 20,000,000 Americans
  - #1 in behavioral health
  - #1 in public health
- Complete suite of solutions
  - Electronic Medical Record
  - Patient Billing
  - Practice Management
  - Managed Service Offering
  - Connectivity/HIE
- Broad range of Managed Services
  - IT Hosting/SaaS
  - IT Outsourcing
  - Revenue Cycle Management
- 650 Associates in 4 locations
  - New York, Kansas City, Chicago, Columbus
TRENDS
2.5 quintillion \( (10^{18}) \) bytes of data created daily
90 percent of the world's data created in the last two years.
Increased Accountability

VALUE = \frac{\text{Improving Outcomes}}{\text{Reducing Cost}}
Steps to Driving Accountable Care

**Clinical Innovation**
- EHR & Medication Management
- Meaningful Use
- Clinical Decision Support

**Care Coordination**
- Information Exchange
- Primary Care Integration
- Population & Community Health Management

**Business Efficiencies**
- Hosting & SaaS
- Revenue Cycle Management
- Managed Services
- Technology Partners

**Improving Outcomes**
- Reduce Cost

Delivering Accountable Care
Netsmart CareConnect Vision

- Lab Results
- Lab Orders Out
- Reportable Labs
- CCD & Referrals
- Quality Measures
- Immunization
- Syndromic Surveillance

Netsmart Clients TIER, Avatar, Insight, MIS

Beacon Community

Labs

Integrated Delivery System

Health Center Network

State Public Health

Community Practice

Federal Agencies

Health Information Organization

CareConnect

Image Source: http://healthit.hhs.gov
Information Change in Behavioral Healthcare

- The half-life for Psychology literature is 6 years.
- It takes approximately 17 years for information to get from research to practice.
- People with serious mental illnesses die 25 years sooner.
Trends

• Clinical Research in Behavioral Healthcare is Well Founded
• Primary Care/Behavioral Healthcare Integration
• Consumer Directed Healthcare
• “Big Data”
Two Philosophies

• Traditional
  – Problem or Deficit Oriented
  – Derived from Medical Model
  – Treatment Plans focus on Diagnosis and Treatments

• Recovery
  – Strengths-based
  – Person-centered
  – Service Plans focus on what the person wants/needs

Problem: In the US, billing is still based on Traditional Model
Clinical Process and Workflow
“It’s an Art, not a Science…”

Who believes the therapeutic relationship is critical to success in Behavioral Health Care?
Therapeutic Factors in Psychotherapy
Percent of Improvement

- **Extra-therapeutic Factors**: 40%
- **Common Factors**: 30%
- **Techniques**: 15%
- **Placebo Effects**: 15%

Lambert, MJ Implications of Psychotherapy Outcome Research for Eclectic Psychotherapy in JC Norcross *Handbook of Eclectic Psychotherapy* 1986 (p437)

Norcross, JC, Psychotherapy Relationships That Work 2002 (p18)
The Relationship…

Even the therapeutic relationship can be (and should be) measured
Therapist Variance

“...the percentage of variance in treatment outcomes attributed to therapists far exceed the variance due to the type of treatment.

...the effect of medication was impacted by the clinician's competence in providing psychotherapy.”

Psychiatrist Effects In The Psychopharmacological Treatment Of Depression

“Life’s tough…

it’s tougher if you’re stupid.”

John Wayne

“Sands of Iwo Jima”
Goal for Electronic Health Records (EHR)

Develop EHR that provides to clinicians:

Contextually appropriate, consumer informed, research-based knowledge, that informs their clinical judgments in real time without disrupting their workflow
Traditional Model

Theory/Experience Based Model
Vendors Allowed Ultimate Flexibility
Clinical Linkages “Golden Thread”

This is now the core on which everything is built
Clinical Decision Support
“CDS”
Why do we need CDS?

*It is now humanly impossible for unaided healthcare professionals to possess all the knowledge needed to deliver medical care with the efficacy and safety made possible by current scientific knowledge.*

[www.openclinical.org](http://www.openclinical.org)

(Note: Good resource for basic info on Medical Informatics)
Evidence-Based Treatments
What Are Evidence-Based Practices?

Evidence-based practices are practices that have been tested employing specified scientific methods and shown to be safe and efficacious.
## EBT vs. PBE

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Characterized by</th>
<th>Assumption</th>
<th>Cost Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence Based Treatments</td>
<td>Protocolized interventions, high fidelity to the model</td>
<td>It works because we did...</td>
<td>Training and Monitoring</td>
</tr>
<tr>
<td>Practice Based Evidence</td>
<td>Large Aggregated Databases</td>
<td>We don’t care why it works, it just does</td>
<td>Technology and Reporting</td>
</tr>
</tbody>
</table>
Practice Based Evidence

External Data Source (EBT) → Pre-Intake → Intake → Service Plan → ProgNotes → Outcomes → Internal Data Source (PBE)
CONSUMER BASED TOOLS
Consumer/User Input

• We are moving to a consumer directed health care system
• The recovery movement is just the behavioral healthcare’s version
• “Input” is a misnomer – it’s much bigger than that
  – Autonomous, self directed services
  – Remote access to professionals
  – Social media-based services
Consumer Input

- Pre-Intake
- Intake
- Service Plan
- ProgNotes
- Outcomes

External Data Source (EBT)
Internal Data Source (PBE)

Consumer Input Portals/PHRs
New Consumer-Driven Clinical Services

Pre-Intake → Intake → Service Plan → ProgNotes → Outcomes

External Data Source (EBT) → Internal Data Source (PBE)

Consumer Input Portals/PHRs → Mobile/Telemed → Social Networking
“Big Data”

Can Behavioral Healthcare Use Large Data Sets?
Big Data ROI

- **Telco**: 92% decrease in processing time by analyzing networking and call data
- **Utilities**: 99% improved accuracy in placing power generation resources by analyzing 2.8 petabytes of untapped data
- **Healthcare**: 20% decrease in patient mortality by analyzing streaming patient data

A few years ago, IBM’s new computer was a curiosity. Now Watson is poised to change the way we make decisions about medicine, finance, and more.

by Jon Gertner
photographs by Dan Winters
Data Analytics Strategy

Netsmart Research Database
(20MM People)

Behavioral Pathway Systems
(1000’s of Organizations)

Enlighten Analytics

Enterprise EHR
Avatar | Tier | MIS | Insight

Enterprise EHR
Avatar | Tier | MIS | Insight

Descriptive Analytics

Predictive Analytics

Centerstone Research Institute

Other Research Entities

Aggregate Data

Encounter Level Data

New Outcomes Measures/Metrics
### Access Benchmarks

<table>
<thead>
<tr>
<th>Select</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Access to Outpatient Counseling/Psychotherapy Services</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Access to Psychiatric Medication Services</strong></td>
</tr>
</tbody>
</table>

### Attendance Benchmarks

<table>
<thead>
<tr>
<th>Select</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>No-Show Rates</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Client Cancellation Rates</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Therapist Cancellation Rates</strong></td>
</tr>
</tbody>
</table>

### Clinical Benchmarks

<table>
<thead>
<tr>
<th>Select</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Medication Error Rate</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Client Suicide</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Seclusion/Restraint</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Re-Admissions within 30 Days</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Client Perceptions of Care</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Vocational Outcomes</strong></td>
</tr>
</tbody>
</table>
Case Study: Predictive Analytics
Question

Can we predict what treatments are likely to be most effective for this individual based solely on data available at intake?
Results

Using only Intake information:

Accurately predicts treatment response for more than 70% of clients
Chance of Achieving Average or Better Outcome Improvement

Service Package for Patient A

- Meds: 87.5%
- CM+Ind: 26.6%
- CM+Grp: 28.3%
- CM+Meds: 42.5%
- CM+Meds+Ind: 28.3%
- CM+Meds+Grp: 27.6%

CM – Case Management
Ind – Individual Tx
Grp – Group Tx
Meds – Medication

Highest probability of success
Chance of Achieving Average or Better Outcome Improvement

Service Package for Patient B

<table>
<thead>
<tr>
<th>Package</th>
<th>Probability</th>
</tr>
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<tbody>
<tr>
<td>Meds</td>
<td>55.6%</td>
</tr>
<tr>
<td>CM+Ind</td>
<td>60.3%</td>
</tr>
<tr>
<td>CM+Grp</td>
<td>77.9%</td>
</tr>
<tr>
<td>CM+Meds</td>
<td>45.2%</td>
</tr>
<tr>
<td>CM+Meds+Ind</td>
<td>62.4%</td>
</tr>
<tr>
<td>CM+Meds+Grp</td>
<td>77.3%</td>
</tr>
</tbody>
</table>

CM – Case Management
Ind – Individual Tx
Grp – Group Tx
Meds – Medication
Conclusion

This approach represents a promising avenue toward reducing the current gap between research and practice across healthcare, developing data-driven clinical decision support based on real-world populations, and serving as a component of embedded clinical artificial intelligences that “learn” over time.

Overall Goal:

Change the way healthcare is delivered

Personalized Medicine

“What works best for you”?\textsuperscript{\textregistered}
Personalized Care and Treatment

Last week, Life Technologies of Carlsbad, Calif., announced that it will be able to map an individual's entire genetic sequence in one day, for $1,000.
Mobile Health User Stats
### Observations

**Abrams, Anna**

**ID:** 12345-78

**Sex:** F

**DOB:** 02/22/1968

**Age:** 44

**Unit:** West Wing

**Room:** 0000

**Bed:** A

**Allergies:** (2)

#### Patient Notes

<table>
<thead>
<tr>
<th>TIME</th>
<th>BEHAVIOR</th>
<th>ACTIVITY</th>
<th>LOCATION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am</td>
<td>2A-Quiet</td>
<td>1K-Watching TV</td>
<td>RO-Bedroom</td>
<td></td>
</tr>
<tr>
<td>7:15 am</td>
<td>2A-Quiet</td>
<td>1K-Watching TV</td>
<td>RO-Bedroom</td>
<td></td>
</tr>
<tr>
<td>7:30 am</td>
<td>2A-Quiet</td>
<td>1E-Eating</td>
<td>CF-Cafeteria</td>
<td></td>
</tr>
<tr>
<td>7:45 am</td>
<td>2A-Quiet</td>
<td>1E-Eating</td>
<td>CF-Cafeteria</td>
<td></td>
</tr>
<tr>
<td>8:00 am</td>
<td>2A-Quiet</td>
<td>1E-Eating</td>
<td>CF-Cafeteria</td>
<td></td>
</tr>
<tr>
<td>8:15 am</td>
<td>1I-Interacting with Peers</td>
<td>1B-Art &amp; Crafts</td>
<td>D-Dayroom</td>
<td></td>
</tr>
<tr>
<td>8:30 am</td>
<td>1I-Interacting with Peers</td>
<td>1B-Art &amp; Crafts</td>
<td>D-Dayroom</td>
<td></td>
</tr>
<tr>
<td>8:45 am</td>
<td>Tap to add entry...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:00 am</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9:15 am</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Vitals

- **Blood Pressure**
  - **Range:**
  - **Last 30 Days:**

### Mobile Points of View

**Other Points of View**

- **Ambien**
  - **Dosage:** 5 mg
  - **Route:** TAB, PO (1/2 x 4 QHS)

- **Celexa**
  - **Dosage:** 10 mg
  - **Route:** TAB, PO (1/2 x 4 QHS)

- **No Known Allergies**

- **Diagnoses**
  - **Obsessive-Compulsive Disorder**
  - **Anxiety Disorder NOS**
  - **No Diagnosis on Axis II**
  - **ANKLE FRACTURE**

- **Educational problems**
  - 70
Too often we hold fast to the clichés of our forbearers. We subject all facts to a prefabricated set of interpretations. We enjoy the comfort of opinion without the discomfort of thought.

- John F. Kennedy