Transforming Patient-Reported Data into Actionable Analytics

Gerard Brennan, PT, PhD, FAPTA
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Lee Pierce, MIS
Devyn Woodfield, MS
Kate Minick, PT, DPT, OCS

Disclosure

• Gerard Brennan was involved in the development and commercialization of Intermountain ROMS

• Hawkins, Pierce, Woodfield & Minick: No relevant financial relationship exists

Learning Objectives

• Be able to identify potential sources of data in the electronic health record system and understand the common terms used to describe data infrastructure in order to speak the same language as a data analyst

• Be able to describe how integrated analytics can be used in rehabilitation and to understand the key steps to achieve integrated analytics in a rehabilitation practice

• Be able to identify key components of creating a data-driven culture

Intermountain Healthcare
Not-for-Profit System
Based in Salt Lake City, Utah

PT Northwest Fast Facts

• Based in Salem, Oregon
• Started in 1977
• Provide All Rehab Therapies
• Provide Services at 12 Outpatient Clinics, 2 Hospitals, 3 Universities, & 6 High Schools
• Roughly 150 Employees
Provider Data Analytics to Improve Outcomes

Why is this Important?

Gerard P. Brennan, PT, PhD, FAPTA
Director of Research
Senior Clinical Research Scientist

• Patients are sharing a greater portion of the cost
• Payers will base reimbursement on episodes, bundles, and population health
• Providers need data to determine their value
• Most rehab providers do not have an outcomes tracking system

US Health Care Disruption is aimed at delivering VALUE

Jeff Bezos of Amazon,
Warren Buffet of Berkshire Hathaway,
Jamie Dimon of JP Morgan Chase

• It seems unclear and depends on whom is setting the agenda
• Healthcare stakeholders are not aligned in their aims:
  • Competing perceptions of patients, physicians, care providers, employer health plans, all sorts of payers

What does “value” actually mean for companies and individuals?

Harvard Business Review

The key characteristics of high value depends on whose perceptions?

• 45% chose “My Out-of-Pocket Costs are Affordable”
• 32% chose “My health improves”
• 90% of patients chose combinations of (5) value characteristics that were different than physician choices.
• Cost and Service were far more important in determining value for patients than for physicians

“Price is what you pay, value is what you get”
(Warren Buffett)

“Analytic Solution:
1. Helps to understand our clinical practice patterns and processes of work.
2. Helps to detect processes and outcomes that might indicate inappropriate care.
3. If there are outcome measures in place somewhere in the system.
4. Helps to understand where the waste is happening and points us toward solutions.

Analystic Solution:
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Analytics can help us understand the opportunity to improve

Opportunity:
1. Massive variation in clinical practices (beyond even the remote possibility that all patients receive good care)
2. High rates of inappropriate care
3. Striking inability to “do what we know works”
4. Not implementing guideline-recommended care into practice
5. Unacceptable rates of “failure to progress.”
6. Overuse and misuse of care
7. Huge amounts of waste, leading to spiraling prices that limit access to care

Analytic Solution:
1. Helps to understand our clinical practice patterns and processes of work.
2. Helps to detect processes and outcomes that might indicate inappropriate care.
3. If there are outcome measures in place somewhere in the system.
4. Helps to understand where the waste is happening and points us toward solutions.
The Value-Based Health Care IT Agenda: Restructure care delivery and measure results.

Leverage IT to help achieve two key aims:
- To restructure care delivery
- To measure the results

1. Establish common and precise definitions to improve reporting
2. Combine and leverage all types of data
3. Aggregate data on the full cycle of care for the condition.
4. Create standard templates for evaluation and treatment visits
5. Collect structured data (not text boxes)
6. Allow easy extraction of outcomes, process, and activity-based cost measures for each patient and medical condition.
7. Adopt interoperability standards.

We need data to make the case for change: Internally

Internally for physical therapy to show value:
- Create Data systems and management structures that:
  - Increase accountability
  - Drives improvement
  - Produces savings
- How? Through measuring, understanding, and managing variation among clinicians providing care.
- Why?

Building a data system
1. Pick a high priority process
2. Build a conceptual model
3. Generate a list of desired reports

Trends in Post-Acute Care Use Among Medicare Beneficiaries: 2000 to 2015
- Use of post-acute care increased
- LOS was increased.
- SNFs (85%) paid per diem → strong incentive to maintain longer LOS.
- Need policy incentives to reduce LOS
- Little evidence that PAC improves patient outcomes: preventing rehospitalizations or improving functional recovery
Building a data system: 4. Generate a list of data elements.

1. Clinical condition
2. Visits—from billing system
3. Failure rate: derived from admit and final scores
4. Facility, Dept, PT, MD, Payer

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Building a data system

5. Negotiate what you want with what you have
   - Identify the data sources for each element: existing/new, automated/manual
   - Consider the value of the final report vs. cost of getting the data
6. Plan data flow
7. Test final system

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Motivational Interviewing

Back Booklet
Assess Acute/Chronic M&M Rds
% Chance SBST
PIPT training TBC training

Failure rate is 26.1%
Patients have minimum of 3 visits

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Does Adherence to the Guideline Recommendation for Active Treatments Improve the Quality of Care for Patients With Acute Low Back Pain Delivered by Physical Therapists?

Examined relationship between adherence and non-adherence to the recommendation for an active treatment approach to acute LBP

Measured Physical Therapists’ quality indicators
- Work processes (procedures)
- Clinical Outcomes
- Cost of care

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Physical Therapy for Acute Low Back Pain

Examined relationship between adherence and non-adherence to the recommendation for an active treatment approach to acute LBP

Examined physical therapy outcomes related to adherence for these patients
Examined subsequent healthcare consumption and charges for one year after physical therapy services
- 18 (4%) no longer covered by SelectHealth (n=475)
Physical Therapy for Acute Low Back Pain

Adherent care in Physical Therapy was associated with:
- A mean reduction in PT charges of about $170
- A mean reduction in total cost of care for 1-year of approximately $1400
- 18% relative risk reduction (RRR) for additional care
- 37% RRR for muscle relaxant prescriptions
- 56% RRR for MRI
- 58% RRR for fluoroscopic-guided injections

“The playing field is changing”

- PATIENTS are sharing a greater portion of the cost
- PAYERS will base reimbursement on episodes, bundles, and population health
- PROVIDERS need data to determine their value
- MOST REHAB PROVIDERS do not have an outcomes tracking system

We need to make the case for change: Externally

Focus on processes of care NOT the providers who execute them!

- “Measurement for Improvement” generates data for frontline process management and improvement.
- “Measurement for Selection” ranks the performance of care providers.
  - It incentivizes clinicians to improve their reported performance but does nothing to drive improving the process of care.

Take a “Measurement for Improvement Approach”

- Focus on the care delivery process and NOT the clinicians who executed the processes.
- Reducing variation is associated with better outcomes and lower costs → VALUE
- Quality Improvement is the science of process management
- The best way to reduce cost is to improve quality

Improve clinical care by reorganizing its delivery

Researchers need to partner with clinicians to evaluate and to demonstrate not only best care models but also innovative financial models that can provide the best clinical result at the lowest necessary cost.

Analytics for Rehabilitation
THE APPROACHES, PROCESSES AND TECHNOLOGIES FOR TRANSFORMING DATA INTO ACTIONABLE ANALYTICS
Lee Pierce, Healthcare Chief Data Officer, Sirius Computer Solutions
Data and Analytics Program Definition

The convergence of people, processes and technology that ensures important data assets are formally managed and leveraged throughout the enterprise

- **Managed** = Data Integration (EDW), Data Governance
- **Leveraged** = Analytics & Business Intelligence
  - Leads to optimized decision making and business strategy execution

Formula for Success

The success of a Data and Analytics Program is influenced by its collective capabilities across each of these dimensions:

From Data to Value

Healthcare Data Value Cycle

Healthcare Data Sources

Analytics Levels
The Who of Analytics – a Team Sport

**Business/Clinical Resources**

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Business/Clinical Champion</td>
<td>Determines vision - an executive analytics champion, sets the expectation to use data for decision making</td>
</tr>
<tr>
<td>Business/Clinical Analytics</td>
<td>A leader that day-to-day makes sure the analytics strategy and focus is being achieved</td>
</tr>
<tr>
<td>Clinic Leaders, Staff</td>
<td>Contribute to data entry, data quality, running and using reports, using data for better decision making</td>
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**Data Resources**

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Analyst</td>
<td>Creates reports and dashboards, technical and/or statistical skills, database knowledge and skills, data knowledge, designs, develops, and maintains data warehouse/data integration</td>
</tr>
<tr>
<td>Data Architect</td>
<td>Designs, develops, and maintains data warehouse/data integration</td>
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Analytics Terminology

- Improved Outcomes
  - Lower pain and suffering by doing what we know works
  - Lower Costs
    - Saving $1400 per low back pain case
    - PT vs. MRI/Opioids - $4900 per case
  - Prediction Algorithms
  - Improved Relationship with Payers
  - Research
  - Nearly 50 published studies and articles
  - Therapist Engagement
  - Patient Engagement
  - Therapist Training/Education
    - TKA, Neck Pain, Low Back Pain – helped focus

Data/Analytics Focus – What difference has it made?

- Better clinical practice delivered in a consistent and integrated way

Outcomes Improvement Approach

- Disseminate Results
- Determine Outcomes
- Define Best Practice
- Measure Performance and Compliance
- Pareto Analysis

Our Journey Begins In 2011 . . .

- A Coordinated Care Organization with 800+ Providers & Insurance Plans (Medicaid Driven)
- Medical Director had a strong analytics background.
- Medical Director loved PT Northwest, but hammered the physical rehabilitation industry for its lack of data to support paying for its services.
Our Journey Continues . . .

- Dr. William Adair
- Spoke at NARA 2011 & 2013 Fall Conferences
- VP For Clinical Transformation At Advocate Health
- Leader in Accountable Care Organizations Nationally
- “Organizations with the best data & understand how to use it will thrive under the Affordable Care Act”.

Our Journey Continues . . .

- The Epiphany
- The story of how Billy Bean brought data analytics to baseball with great success.
- “They are asking all of the wrong questions.” “Thinking is medieval.”
- “We have got to think differently.”
- The same thinking needed to permeate healthcare & physical rehabilitation.
- If America’s oldest & most change resistant game could change, so could physical rehabilitation.

Our Journey Intensifies . . .

- TED Talk: How Great Leaders Inspire: One of the most watched TED Talks ever.
- It all starts with Why We Do What We Do.
- As PT Northwest navigated through the Affordable Care Act changes, we wanted to focus on The Why: Restore Our Patients’ Active Lifestyle/Transform Our Patients’ Live

Our Journey Finally Comes Together . . .

- I witnessed how a Data Driven “Mindset” was driving continuous improvement across all of Intermountain Healthcare.
- This was the future of healthcare. This “Mindset” could be brought into an organization of any size including PT Northwest.

How Did We Implement A Data Driven Coaching Model?

- **Data Driven Coaching Defined**: Identifying the key performances indicators (KPIs) in each area of the organization, systematically collecting data on these KPIs, sharing the data on these KPIs throughout the organization, and working collectively as an organization to coach individuals to achieve these KPIs.

- **Do It Yourself v. Bring In Outside Help Approaches**

The Data Driven Coaching Objectives

- A More Accountable Culture
- Eliminate Waste (Core LEAN Principle)
- Become A More Efficient Healthcare Organization
- Determine The Key Performance Indicators That Truly Drive PT Northwest
Our Key Performance Indicators...

- 3 Quality Measures & 2 Productivity Measures
- Keep It SIMPLE!!!
- PT Northwest’s Key KPIs
  - ROMS (Clinical Outcomes) Admission %
  - ROMS (Clinical Outcomes) Classification %
  - Patient Satisfaction % (Net Promoter Score)
  - Units/Visit
  - Vacancy Rate

Our Data Driven Huddleboards v. 1.0

- The Clinic/Department focused on collectively improving and achieving our KPIs.
- Solutions to other problems often arose.
- An unanticipated benefit was communication improved throughout the organization.

Our Data Driven Huddleboards v. 2.0

Weekly & Monthly Scorecards

Weekly & Monthly Scorecards

The Benefits Of a Data Driven Approach

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<th>Year</th>
<th>DASH</th>
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<td>16/17</td>
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<td>11</td>
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<tr>
<td>2018</td>
<td>21/19</td>
<td>21</td>
<td>13</td>
<td>12</td>
<td>9</td>
<td></td>
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</tbody>
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Minimum Clinical Important Difference (MCID): DASH 10/QDASH 9, KOS 10, LEFS 8, NDI 10, ODI 8
The Benefits Of a Data Driven Approach

- Improved Patient Engagement
  - Objective way to access status & treatment response at each visit

- Improved Clinical Learning Experiences With Therapists
  - Easier conversations based on objective data
  - New level of accountability through utilization reviews
  - Drives decision making on unified & individual continuing education
  - Example: Psychologically Informed Physical Therapy

- Provides information to drive our Clinical Enhancement Meetings
  - Start with data, couple with benchmarks/comparatives, & follow up with clinical practice guidelines

- Improved capture of billable time
  - 39.3% increase

- Improved vacancy rate
  - 20.3% decrease

- Stronger emphasis on patient satisfaction
  - Net Promoter Score: 83 World Class (Scale: 100 to 100)

What Did Employees Think Of A Data Driven Approach?

- In 2015, PT Northwest outsourced our annual employee survey to the national firm of Workplace Dynamics (now Energage).
- At the time, a record number of employees responded in 2016 (84%).
- We were expecting a tsunami of negativity.

What Did Employees & The Industry Think Of A Data Driven Approach?

- Best Survey Ever
  - Employees felt PT Northwest was heading in the right direction, and embracing the future.
  - A Data Driven Coaching approach finally brought clear expectations & accountability.
  - Millennials loved it.
  - They would not go back.
  - Data Driven Coaching is now part of “The PT Northwest Way”.

Do Employees Still Embrace A Data Driven Coaching Approach?

- Communicate, Communicate, Communicate
- Emphasize The Why We Do What We Do
- Engage In The “Spirited Discussions”
- Town Halls At Company, Department, & Clinic Levels. Promote An “Ask Anything Culture”.
- Be Totally Transparent & Expect Accountability From Everyone.
- Expect Opposition. People Don’t Like Change.
- Stay The Course.

How Did PT Northwest Create An Analytics Culture?

- Communicate, Communicate, Communicate
- Emphasize The Why We Do What We Do
- Engage In The “Spirited Discussions”
- Town Halls At Company, Department, & Clinic Levels. Promote An “Ask Anything Culture”.
- Be Totally Transparent & Expect Accountability From Everyone.
- Expect Opposition. People Don’t Like Change.
- Stay The Course.
The Journey Comes Full Circle In 2019...

- We are currently talking about embedding physical therapists in their sites.
- We are discussing an alternate payment model to treat this patient population.
- The goal is to improve care, better assist the Primary Care Physician sites, and better manage this caseload.
- Our Data Driven Coaching experience is a big reason why they are talking with us.

Contact Info:

- Kennedy Hawkins, MBA, JD, LLM
  - President-PT Northwest
  - Past President-National Association of Rehabilitation Agencies
- Phone: 503.540.8701
- Email: khawkins@ptnorthwest.com

What is an Analyst?

Think Data, Data, Data

- Retrieve Data
- Gather Data
- Organize Data
- Visualize Data
- Analyze Data
- Provide Insights with Data

Becoming Familiar with Analyst Jargon

Common Visualization Tools

- Tableau
- Power BI
- Qlik
- Many more!
Becoming Familiar with Analyst Jargon

Common Statistical Tools
- R
- SAS
- SPSS
- Many more!

Data Manipulation Tools
- SQL (Structured Query Language)
- Alteryx
- Microsoft Excel
- Many more!

Educational Background of Data Analysts
- Mathematics
- Statistics
- Computer Science
- Information Systems
- Finance
- Economics
- Many, Many More

Many Colleges are beginning to offer specialized majors and emphases in Data Science, Data Analytics, Machine Learning, Business Intelligence, etc.

A list of analysts had no formal education in analytics, but learned it on the job.

Analyst does NOT usually have clinical experience

When I First Started...

Devyn, can you pull the ODI scores for this clinic? What’s an ODI score?

It’s the Oswestry Disability Index. What’s the Oswestry Disability Index?

It measures LBP. What’s LBP?

Low Back Pain. How many reached MCID criteria? What’s MCID?

It stands for Minimal Clinically Important Difference

When I First Started...

Devyn, I don’t have access to the report. Can you help? Ok... I still don’t have access.

I forgot to embed my credentials. Oops. I forgot to grant you access privileges on the server.

I made an error in my SQL query. I can see it, but the data looks wrong.

How long until it’s fixed? Couple Hours. When the data extract is refreshed, I’ll push this to the production server for you to view.

Working with an Analyst

- Identify the individual(s) that will retrieve the data
- Communicate, Communicate, Communicate
- Here are some real examples of how NOT to do this:
Example – The Vague Requestor
From: Doctor Strange
Sent: Thursday, August 30, 2018 9:39 AM
To: Devyn Woodfield
Subject: Readmission Rates Report

Hi Devyn,

I have been asked by our medical director to look at our readmission rates at our facility. Could you create a report for us to look at this information? Let me know if you have any questions.

- Doctor Strange

Example – The Vague Requestor
What’s wrong with this?
• How do you define a readmission?
  • Within X days?
  • Same facility? Different Facility?
  • Related to first visit? How do we identify if visits are related?
• What’s the deadline?
• What’s your facility?
• What date range do you want to look at?
• Is this a one-time report?
• Do they want a spreadsheet? An interactive Dashboard?
• What is this going to be used for?

Example – The Procrastinating Requestor
From: Doctor Mario
Sent: Thursday, September 19, 2018 9:39 AM
To: Devyn Woodfield
Subject: Opioid Prescription Report needed ASAP

Hi Devyn,

I need a report showing how many Opioids have been prescribed by this doctor in the past year. I need this by 5 pm today or else we will receive a fine from the state, we’ll lose revenue, we’ll cause patient harm, and I will lose my job. No pressure. Thanks!

- Doctor Mario

Example – The Procrastinating Requestor
What’s wrong with this?
In addition to the vague details,
• This request does not give the analyst enough time to complete the request.
• Solutions do not get created as quickly as you think.

Example – The Hit and Run Requestor
From: Doctor Who
Sent: Thursday, October 24, 2018 9:39 AM
To: Devyn Woodfield
Subject: Physical Therapy Patient List

Hi Devyn,

I need a list of patients that have received physical therapy for low back pain at our facility in the last month. We’ll need this by the end of the current month. Reach out if you have questions. Thanks!

- Doctor Who

Example – The Hit and Run Requestor
From: Doctor Who
Subject: RE: Physical Therapy Patient List
Devyn,

We ended up not needing this. Thanks!

- Doctor Who

Example – The Hit and Run Requestor
From: Devyn Woodfield
Subject: RE: Physical Therapy Patient List
Devyn,

Just to clarify, this is only for low back pain patients? What will you use this report for? What patient/encounter information would you like on this report? What format should the output be in?

Thanks,

- Devyn

Example – The Hit and Run Requestor
From: Devyn Woodfield
Subject: RE: Physical Therapy Patient List
Devyn,

Just following up on my previous questions, please review. Once I have those, I’ll be able to get this patient list to you.

Thanks,

- Devyn

Example – The Hit and Run Requestor
From: Devyn Woodfield
Subject: RE: Physical Therapy Patient List
Devyn,

Just following up. See email below.

Thanks,

- Devyn

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- Devyn
This is a Duet

- Therapist: Make Request
- Analyst: Gather Additional Information
- Therapist: Provide Clarifying Information
- Analyst: Communicate Progress
- Therapist: Provide Clarifications and/or Deadlines
- Analyst: Provide First Draft of Report
- Therapist: Review Report. Provide Feedback
- Analyst: Review and Implement Feedback

Repeat until in sync

Remember This

- Be specific
- Communicate Openly and Often
- Avoid jargon and acronyms
- Explain the WHY of the request
- Communicate deadlines
- Provide screenshots and examples for the analyst
- Think of how you would like to receive the data
- Be mindful of PHI

Other things to remember

Free text is not your friend

- When you say, I want Sit to Stand data, this is what the analyst sees:
- It’s much better in a standard field

How do you gain insight through so much variation?

All patients with starting ODI score of 34.

Case Examples

Analytics in Action

Kate Minick, DPT, OCS, CSCS
Internal Process Control Coordinator
Rehabilitation Services

Low Back Pain & Depression Example

Start with an idea

Does depression affect whether or not a patient comes to physical therapy and how much improvement they gain?
Low Back Pain & Depression Example

*Draft 1 – not a significant finding*

What else do we need to know?
- Chronic Pain registry → barrier
- Opioid prescriptions?
- What about clinics that have implemented Mental Health Integration?

Who else do we need input from?
- Behavioral Health
- Data Experts

What if you don’t have a Data Person?

Do what makes sense for you
- Excel Spreadsheets
- Hire
- Etc. (To be filled out later)
Are you being reactive, predictive, or prescriptive?

Quality Improvement Methodology
1. Identify a high-priority clinical process
2. Build an evidence-based best practice protocol
3. Blend it into the clinical workflow
4. Embed data systems to track results
5. Demand that clinicians vary based on patient need
6. Feed data back in a Lean Learning Loop

1. Quality Improvement Methodology
   1. Identify a high-priority clinical process

2. Quality Improvement Methodology
   2. Build an evidence-based best practice protocol

3. Quality Improvement Methodology
   3. Blend it into the clinical workflow

4. Quality Improvement Methodology
   4. Embed data systems to track results
5. Demand that clinicians vary based on patient need
   • “Justify”

6. Feed data back in a Lean Learning Loop
   Quality Review feedback
American health care "gets it right" 54.9% of the time.


2017 Failure-to-Progress

2017 Q4 & 2018 Q2 Combined

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<td><strong>146</strong></td>
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Pearson chi²(4) = 23.416, p=0.000
2017 Q4 & 2018 Q2 Combined

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Pearson chi²(4) = 6.4188, p=0.011

Next Steps
- **Standardize** documentation fields
- Electronic quality reviews

Contact Information
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