

Discovering Uses for “Big Data”

...and other associated topics

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Why data?

- Big data
- What do we do with this data? Data for Data's sake is not very useful
- Inform clinical practice
- Smaller data

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Introduction: Finding Big Data

- Numotion, a US- based supplier, active client-load of 250, 000, over 440 rehab technology suppliers who are ATP's
- Business operations are highly skewed toward Complex Rehab Technology (CRT)

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The objective of this study was to describe the provision of wheeled-mobility equipment from the perspective of a large equipment supplier in the United States

Analysis is used to ...

- Assess service delivery policy and business practices
- Define research opportunities

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The Population

- 19, 563 people delivered a new powered or manual mobility base over 2 quarters
 - Last quarter 2016, First quarter 2017
- Sample size of 1689
- Margin of error =3%

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Initial Data Set

- **Wheelchair group**
 - using HCPCS codes
- **Therapist involvement**
 - yes/no
- **Equipment Category**
 - Complex Rehab Technology (CRT) vs standard DME
- **Bariatric**
 - mobility base that was Heavy Duty or Extra Heavy Duty, or w/ seat width > 20"
- **Self-Pay**
 - Any client contribution by client
- **Agecode**
 - <18; 18-30; 31-40; 41-50; 51-60; 61+
- **Diagnostic group**
 - 3 ICD-10 codes captured for each person
- **Aftersale Service Intervention**
 - Change that did not result in extra billing

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AgeCode	Count	
< 18	477	28.2%
18-30	212	12.6%
31-40	157	9.3%
41-50	159	9.4%
51-60	245	14.5%
61+	439	26.0%
N=	1689	

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ICD10 category	Count	
Abn clinical finding	62	3.8%
Blood & blood-forming organs	4	0.2%
Circulatory system	78	4.7%
Congenital	155	9.4%
Digestive system	3	0.2%
Endocrine-metabolic	42	2.5%
Ext causes of morbidity	1	0.1%
Eye	2	0.1%
Factors influencing health	27	1.6%
Genitourinary system	3	0.2%
Infections & parasites	10	0.6%
Injury-external causes	97	5.9%
Mental-neurodevelopmental	48	2.9%
Musculoskeletal system	91	5.5%
Neoplasms	9	0.5%
Nervous system	970	58.7%
Perinatal	9	0.5%
Pregnancy & childbirth	1	0.1%
Respiratory system	31	1.9%
Skin and subQ tissue	10	0.6%

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Pinpointing Diagnoses

- Diagnoses- how can that help us?

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Problems with capturing accurate diagnoses

G710	Muscular dystrophy	2424
G7100	Muscular dystrophy, unspecified	288
G7101	Duchenne or Becker muscular dystrophy	32
G7109	Other unspecified muscular dystrophies	2
G809	Cerebral palsy, unspecified	16520
G8220	Paraplegia, unspecified	6347
G8250	Quadriplegia, unspecified	4716
G8251	Quadriplegia, C1-C4 complete	703
G8253	Quadriplegia, C5-C7 complete	773

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CRT Manual WC	400	23.7%
StdDME Manual WC	122	7.2%
Pediatric TIS	139	8.2%
Pediatric WC	170	10.1%
POV Group 1	66	3.9%
PWC Group 2 StdDME	54	3.2%
PWC Group 2 CRT	39	2.3%
PWC Group 3	468	27.7%
PWC Group 4	13	0.8%
PWC Group 5 Ped	4	0.2%

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Therapist involvement

- 52% of interventions involved a therapist
- CRT 2 ½ times more likely to involve a therapist

Groups with 100+ interventions	Total interventions	% therapist involvement
Adult Manual TIS	214	54%
CRT Manual WC	400	55%
Manual WC	122	28%
Pediatric TIS	139	56%
Pediatric WC	170	51%
PWC Group 3	468	60%

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Self-pay events

- 58% of all interventions included some self-pay contributions
- Discrepancy of self-pay events across age and wheelchair groups
 - Greater self pay
 - CRT Manual WC, POV Group 1, PWC Gr2 CRT and PWC Group 3
 - Persons > 60 yo
 - Lesser self-pay
 - Persons <18 yo

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Aftersale activities

- 13% included aftersale activities
- Group 3 PWC:
 - 1.7 times more likely
- Adult Tilt-in-space
 - 1.4 times more likely
- Therapist involvement
 - Associated with decreased aftersales
 - Adult Manual TIS, Std DME Manual wheelchairs, POV Group 1 and Group 4 PWCs
 - Associated with increased aftersales
 - Group 2 Std DME PWCs

groups with > 100 interventions	Total	% Aftersale
Adult Manual TIS	214	17%
CRT Manual WC	400	14%
Manual WC	122	2%
Pediatric TIS	139	10%
Pediatric WC	170	6%
PWC Group 3	468	18%

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Using
information to
change
process:
Aftersales

- Using information to change evaluation, intervention and documentation processes, and ultimately have a better understanding of issues that may arise during the fitting/training with equipment

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Using Data to
Search for
More
information

- Molding



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This type of analysis can have many implications

- Business
 - Identify situations that require higher levels of interventions
 - Establish quality controls as a means to avoid non-billable services
- Policy
 - Policy should acknowledge the vast array of information that is required.
 - Policies should be developed that facilitate equipment provision
- Clinical
 - Clinicians can define their involvement and value in service delivery processes

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Equipment abandonment:
How does this happen? How can we stop it?



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Whose
responsibility
is this?



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Scope of the
Issue: Studies

- Not many studies, most are for AT in general, not wheelchairs in specific
- In general, 14%- 20% rate of abandonment
- The common theme:
 - LACK OF SHARED DECISION-MAKING AND EXPECTATIONS NOT MET

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equipment
abandonment...



- The common themes:

- LACK OF **SHARED DECISION-MAKING AND EXPECTATIONS NOT MET**
- Lack of **education and information** about the equipment (size, weight)
- Equipment **not promoting independence** / introducing a **hindrance to the activity** or participation: e.g.: quicker to do it without the equipment.
- **Discomfort** / not meeting postural needs identified during the mat evaluation.
- **Client wanting to “please”** the clinician and ATP supplier & agrees to the equipment...
- No Caregiver “buy-in”
- Inadequate Delivery and **insufficient training** provided. Use and application is not clear.

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Facilitating
communication
throughout the
process

- The “detail” that can make or break an intervention
- Interview
- Mat evaluation
- Functional evaluation
- Trial
- Prescription process
- Fitting



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The Therapist and the ATP Supplier Partnership Responsibilities

- Overlap in every profession, but one cannot just take over
- Sometimes there is a delicate balance
- Natural progression in every profession- but, are we driving or are we being driven?
- Demand has outstripped capacity
 - Nix, et al



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Outcome Measures

- Qualitative outcome measures

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So many roads
that we can go
down...*we*
need to define
the destination



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We must

- Education
- Partnerships
- Capacity

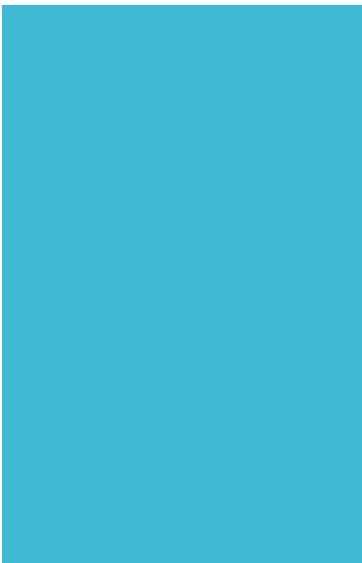
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