

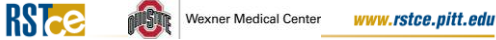
**Outcome Measures
in Assistive
Technology
Service Delivery**

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University of Pittsburgh
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Learning Objectives

1. Explain 3 reasons why it is important to measure the outcomes of an intervention
2. Explain 2 characteristics of a standardized measurement tool
3. Give 2 reasons why formalized outcomes have not been implemented in the field of assistive technology
4. Describe one example of a standardized measure used in rehabilitation.

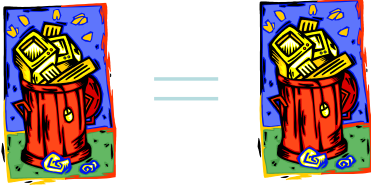



Outline

- Outcome Measure Basics
 - Outcome vs. Measure Definitions
 - Benefits
 - Development
 - Barriers to use
 - Clinical usage strategies
- Case Examples



Data management



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Shirley Fitzgerald, PhD, Outcomes Lecture, Deep Dive AT Institute 2011 Pittsburgh, PA

OUTCOMES

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Measure vs. Outcome

(Websters Dictionary)

Measure
n. A *standard*: a *basis* for comparison; a reference point against which other things can be evaluated; "they set the measure for all subsequent work." *v.* To bring into comparison against a standard.

Outcome
n. something that happens as a result of an activity or process

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What is an Outcome Measure?

“The process of assigning numerals to variables to represent quality of characteristics according to certain rules” – (Nunnally,1978)

- How do patients know if their healthcare is good care?
- How do providers pinpoint the steps that need to be improved for better patient outcomes?
- How do insurers and employers determine whether they are paying for the best care that science, skill, and compassion can provide?

How do we know? We measure



Why Outcome Measures?

- Accountability
- Policy
- Effectiveness
- Justification
- Knowledge
- Improvement
- Inform Consumers
- Influence Payment



Barriers to Outcomes

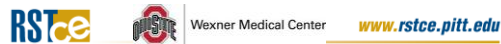
- **Rehab is a Young Science** (Rusk, 1969)
- **Rehab is very “Practice Based”** (Opit et al, 1997)
- **Few Rehab Practitioners with Research Training**
– (Kajermo et al, 1998; Dubouloz et al, 1999)
- **Existing Research tends to be Quasi-Scientific**
- **Limited Access to Large Sample Sizes**
- **Lack of time & resources to engage in research** (Jette, 1993)
- **Research articles too Scientific w/out Clinical Relevance**
– (Philibert et al, 2003)
- **Perceived Potential Threats to Practice**
– (Cusick et al, 1999)

The Pain of Outcome Measures

- Perception that outcome measures are
 - Developed by Academics and Researchers
 - Enforced by Management
 - Endured by Clinicians



People focus on the pain rather than the gain in using outcome measures



Evidence Based Practice

(Rappolt, 2003)

- Client Evidence
- Research Evidence
- Professional Expertise
- Integration
- Clinical Decision Making



Getting Started with Outcomes

- Identify a problem or question
- Evaluate baseline status
- Identify where deficits exist
- Improve systematic assessments
- Influence treatment strategies/plan of care

Therapy Outcome Measure for Rehabilitation Professionals, Hatfield (2007)



Outcome Categories

- Treatment
- Quality Assurance
- Research



Treatment

- Choose between courses of treatments
- Evaluation of a patient's response to treatment
- Change treatment strategies
- Track progress
- Alter treatment to prevent failure

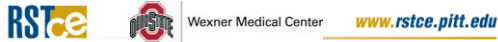
Portney and Watkins, Hatfield (2007), Hatfield & Ogles (2006), Lambert (2001), Dawes (1996)



Quality Assurance

- Identify shortfalls in quality
- Determine the cause of shortfalls
- Evaluate patient safety
- Design and implement interventions
- Assess the impact of interventions
- Sustain and enhance improvements

Becher (2001)



Research

- Compare and discriminate between groups
- Draw conclusions about predictive relationships between variables
- Objectively evaluate subjective measures



Preparation

- To introduce outcome measures the following has to be in place:
 - Structures
 - Systems
 - Processes
 - Staffing
 - Training



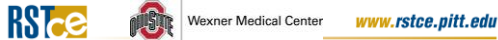
Outcome Measures Appropriate for Clinical Use

- Questionnaires
 - General health status
 - Pain
 - Functional status
 - Patient satisfaction
- Physiological outcomes
- Utilization measures
- Cost measures



Ways to Improve Use

- Have a positive attitude
- Facility buy-in (Management)
- Become familiar with the outcome measures
- Develop setting specific education
- Streamline use
- Pick tools that are easy to use/analyze
- Therapists and Engineers involved from the start
- Support from Admin staff and Research Co-ordinator
- Collaboration with experts



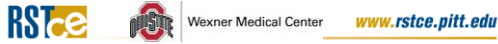
Choosing a Tool

- **Validity**
 - Does it Measure What You are Looking For/Credible
- **Reliability**
 - Consistently Repeatable (time & scorers)
- **Sensitive to Change**
 - Change in Scores Consistent with Clinical Observations
- **Administrative Burden**
 - Time, Apparatus, Clinical Routine



Choosing a Tool

- **Self-Report Questionnaires**
 - Lower Administrative Burden
 - Limited Expertise
 - Flexible Administration
 - Less Valid & Reliable
- **Performance/Capacity Observations**
 - More Administrative Burden
 - Expertise of Observer
 - Apparatus Required
 - In-Person Administration
 - More Valid & Reliable



Examples of Existing Tools

- **WST** - Wheelchair Skills Test
- **FEW** – Functioning Everyday with a Wheelchair
- **FMA** – Functional Mobility Assessment
- **PIADS** - Psychosocial Impact of Assistive Devices Scale
- **QUEST** - Quebec User Evaluation of Satisfaction with Assistive Technology
- **COPM** - Canadian Occupational Performance Measure



Functional Mobility Assessment (FMA)

- Evaluates a person perceived function related to mobility (with or without device)
- Self-report questionnaire
- 10 items that evaluate the performance of mobility in relation to consumer' s goals



FMA Population

- All individuals who have mobility impairments
- Progressive and non-progressive disabilities
- Valid for individuals with minimally impaired cognition and language



FMA Components

- | | |
|------------------|---------------------|
| 1. Daily Routine | 6. Transfers |
| 2. Comfort Needs | 7. Personal Care |
| 3. Health Needs | 8. Indoor Mobility |
| 4. Operate | 9. Outdoor Mobility |
| 5. Reach | 10. Transportation |



FMA Scoring

Each items has score ranges from 1 – 6

- 6 = Completely Agree
- 5 = Mostly Agree
- 4 = Somewhat Agree
- 3 = Somewhat Disagree
- 2 = Mostly Disagree
- 1 = Completely Disagree

- Area to provide comments for each item
- Obtain a total score for comparison
- Can look at individual items



Case Example - Pete

- 50 year old
- 20 yrs post C6-C7 ASIA A SCI
- 6' 200lbs.
- MWC User
- Political Advocate
- Accessible Home
- Accessible Transportation
- Transition from MWC to PWC



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Pre FMA





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Pre FMA Scoring

Item	Pre Score	Item	Pre Score
Daily Routine	1	Transfers	5
Comfort	5	Personal Care	5
Health	5	Indoor Mobility	5
Independence	4	Outdoor Mobility	1
Reach	2	Transportation	5

Pre-Total: 38

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Post FMA



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Assistive Technology Center



AT Center – OSU Wexner Medical Center

- Client Base
 - Adult population (14 and up)
 - Neuro Rehabilitation (Head Injury, Stroke, etc.)
 - Neuromuscular Disease
 - Developmental Disabilities
 - Other



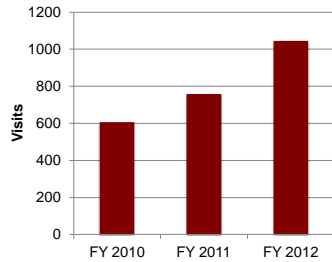
Programs and Equipment

- Programs:
 - Seating and Mobility
 - Drivers Rehabilitation
 - Augmentative and Alternative Communication
 - Computer Access
 - Electronic Aids to Daily Living
- Equipment:
 - Standardized evaluation instruments
 - Comprehensive tool box



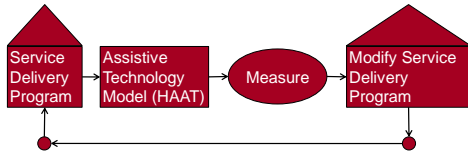
Seating and Mobility Visits

- FY10 – 606
- FY11 – 758
- FY12 – 1046



Outcome Measurement

- Outcome measures evaluate the end result of the assistive technology implementation. (Cook & Polgar, 2008)
 - Functional Performance Measures
 - User Satisfaction Measures
 - Quality-of-Life Measures
- Utilize to modify Service Delivery Program

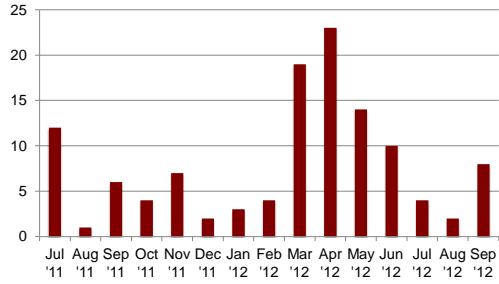


Outcome Measurement – Quality Assurance

- Quebec User Evaluation of Satisfaction with assistive Technology (QUEST)
 - All assistive technology
 - Requires that you already have a device
 - 12 item – 8 device, 4 service
 - e.g. Safety, Durability, Comfort
- Functional Mobility Assessment (FMA)
 - Mobility only
 - Does not require experience with a device
 - 10 items
 - e.g Safety, Independence, Indoor Mobility, Outdoor Mobility

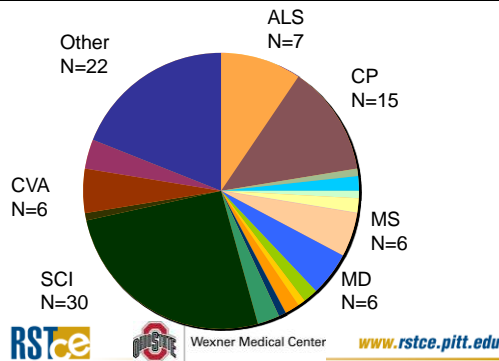


Completed Surveys N=119



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Demographics N=116



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QUEST

Quest User Evaluation of Satisfaction with Assistive Technology
QUEST (Version 2.0)

Technology device: _____
User name: _____
Date of assessment: _____

The purpose of the QUEST questionnaire is to evaluate how satisfied you are with your assistive device and the related services you experienced. The questionnaire consists of 12 satisfaction items.

For each of the 12 items, rate your satisfaction with your assistive device and the related services you experienced by using the following scale of 1 to 5:

1	2	3	4	5
Not satisfied at all	Not very satisfied	More or less satisfied	Quite Satisfied	Very satisfied

Please circle or mark the one number that best describes your degree of satisfaction with each of the 12 items.
Do not leave any question unanswered.
For any item that you were not "very satisfied", please comment in the section comments.

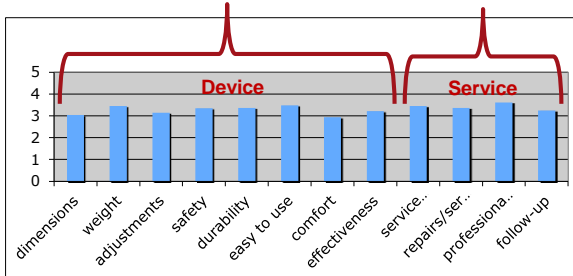
Thank you for completing the QUEST questionnaire.

F. L. Dunlop, R. White-Landroy & B. Pitt, 2009

	1	2	3	4	5
	Not satisfied at all	Not very satisfied	More or less satisfied	Quite Satisfied	Very satisfied
ASSISTIVE DEVICE					
How satisfied are you with:					
1. the dimensions (size, height, length, width) of your assistive device? Comments: _____				1	2 3 4 5
2. the weight of your assistive device? Comments: _____				1	2 3 4 5
3. the ease in adjusting (loosening, fastening) the parts of your assistive device? Comments: _____				1	2 3 4 5
4. how safe and secure your assistive device is? Comments: _____				1	2 3 4 5
5. the durability (endurance, resistance to wear) of your assistive device? Comments: _____				1	2 3 4 5
6. how easy it is to use your assistive device? Comments: _____				1	2 3 4 5
7. how comfortable your assistive device is? Comments: _____				1	2 3 4 5
8. how effective your assistive device is (the degree to which your device meets your needs)? Comments: _____				1	2 3 4 5

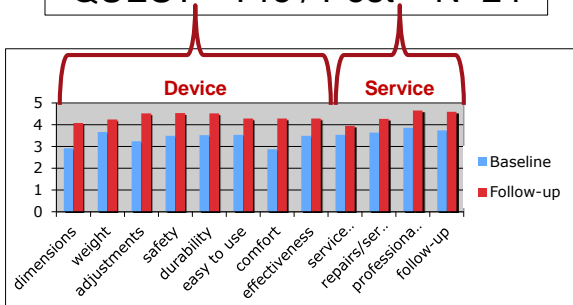
F. L. Dunlop, R. White-Landroy & B. Pitt, 2009

QUEST Baseline – N=119



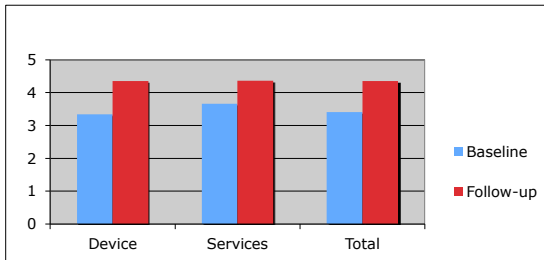
1 – not satisfied 2- not very satisfied 3 – more or less satisfied
4 – quite satisfied 5-very satisfied

QUEST – Pre / Post – N=24



1 – not satisfied 2- not very satisfied 3 – more or less satisfied
4 – quite satisfied 5-very satisfied

QUEST – Pre/Post – N=24



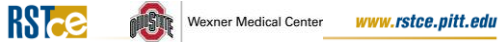
1 – not satisfied 2- not very satisfied 3 – more or less satisfied
4 – quite satisfied 5-very satisfied

QUEST – Top 3 items

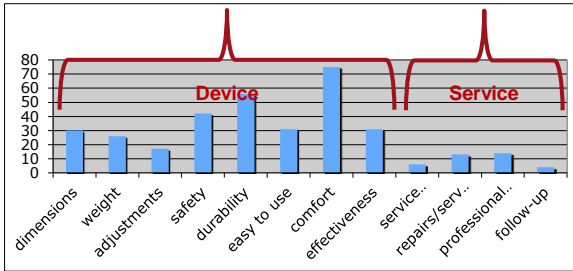
• Below is the list of the same 12 satisfaction items. PLEASE SELECT THE THREE ITEMS that you consider to be the most important to you. Please put an X in the 3 boxes of your choice.

<input type="checkbox"/> 1. Dimensions	<input type="checkbox"/> 7. Comfort
<input type="checkbox"/> 2. Weight	<input type="checkbox"/> 8. Effectiveness
<input type="checkbox"/> 3. Adjustments	<input type="checkbox"/> 9. Service delivery
<input type="checkbox"/> 4. Safety	<input type="checkbox"/> 10. Repairs/servicing
<input type="checkbox"/> 5. Durability	<input type="checkbox"/> 11. Professional service
<input type="checkbox"/> 6. Easy to use	<input type="checkbox"/> 12. Follow-up services

© L. Demers, R. Weiss-Lambrou & B. Ska, 2000

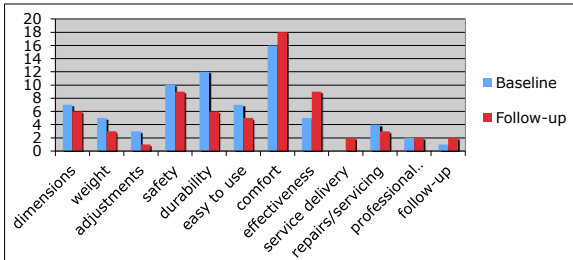


QUEST – Top 3 Items – N=357



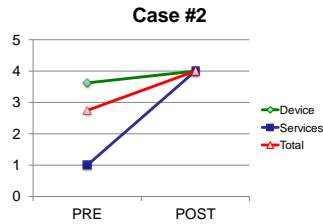
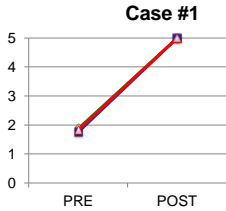
1. Comfort – 75; 2. Durability – 56; 3. Safety – 42

QUEST – Top 3 Items – N=72



Baseline: Comfort – 16; Durability – 12; Safety – 10
 Follow-up: Comfort – 18; 2. Safety – 9; Effectiveness - 9

Single Case Examples



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Functional Mobility Assessment (FMA)

Functional Mobility Assessment (FMA) Beta Version 1.0

Step 1: Please answer the following 10 questions by checking an 'X' in the box under the response (completely agree, mostly agree, slightly agree, etc.) that best describes you and how you feel about your current means of mobility. ...

Step 2: Please determine your priority, by rating the importance of the content in each of the 10 questions in the table to the right of each question. Rate your importance on a 5-point Likert scale as follows:

Priority	5	4	3	2	1
100%	COMPLETELY AGREE				
80%	MOSTLY AGREE				
60%	SLIGHTLY AGREE				
40%	*SLIGHTLY DISAGREE				
20%	*MOSTLY DISAGREE				
0%	*COMPLETELY DISAGREE				
	DOES NOT APPLY TO ME				

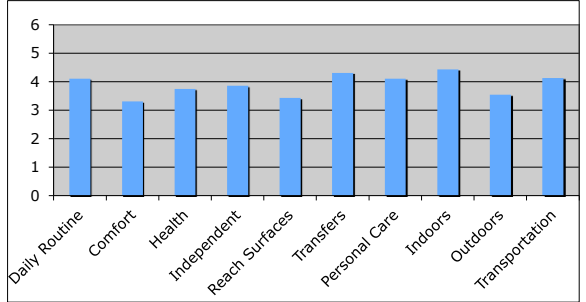
Functioning Everyday with a Wheelchair (FEW)

Please select one choice that best describes how much you agree with the statement

100%	COMPLETELY AGREE
80%	MOSTLY AGREE
60%	SLIGHTLY AGREE
40%	*SLIGHTLY DISAGREE
20%	*MOSTLY DISAGREE
0%	*COMPLETELY DISAGREE
	DOES NOT APPLY TO ME

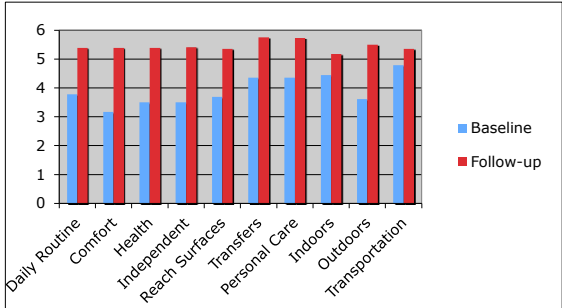
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FMA Baseline – N=116



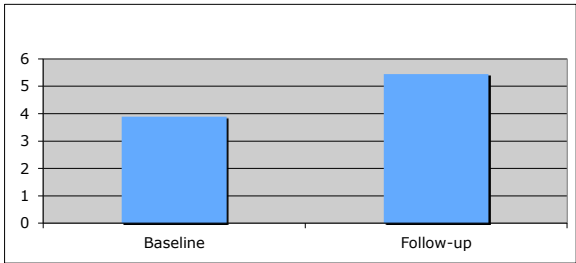
1 – Completely Disagree 2 – Mostly Disagree 3 – Slightly Disagree
 4 – Slightly Agree 5 – Mostly Agree 6 – Completely Agree

FMA Pre/Post – N=18



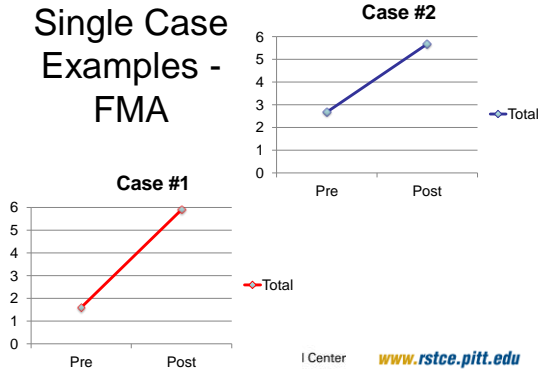
1 – Completely Disagree 2 – Mostly Disagree 3 – Slightly Disagree 4 – Slightly Agree 5 – Mostly Agree 6 – Completely Agree t.edu

FMA Pre/Post – N=18



1 – Completely Disagree 2 – Mostly Disagree 3 – Slightly Disagree 4 – Slightly Agree 5 – Mostly Agree 6 – Completely Agree t.edu

Single Case Examples - FMA



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VA-PRC AT LAB CASE STUDY



VA-PRC AT Lab

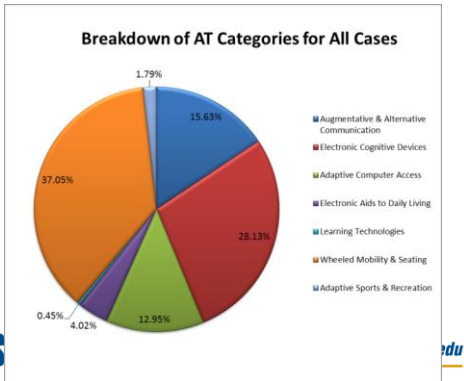
- Working closely with treating clinicians
- Needs assessment
 - Identify perceptions and pilot tools/variables for feedback
- In-person focus groups for data analysis
- In-person focus groups for online data entry
 - Usability Testing and Refinement

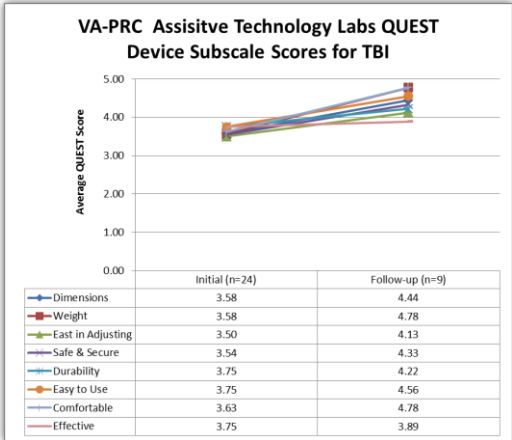


Uniform Data Set

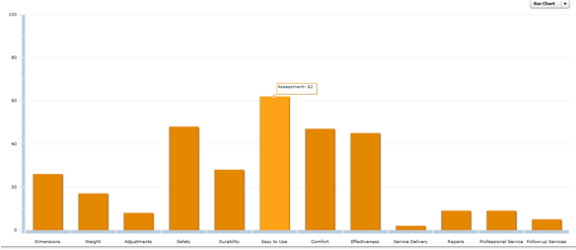
- | | |
|---------------------------------|---|
| • Birth Year | • Device Assessment Date |
| • Deceased Year | • Tool Administration Date |
| • Gender | • Device Type |
| • Race | • Device Sub-type |
| • Language | • Device Name |
| • Zip-code (first three digits) | • Outcome Tools – PIADS, QUEST, FMA, FCM-NOMS |
| • Primary Diagnosis | |

Data Output Examples





QUEST 3-Important Areas for one of the PRC AT Labs



1. Easy to Use – 62 ; 2. Safety – 50 ; 3. Comfort – 48



Summary

- Identify champion(s)
- Get stakeholder buy-in: consumers, clinicians, suppliers, manufacturers, leadership
- Create a plan
- Implement the plan
- Implement the plan – again
- Provide feedback to stakeholders



Thank You..Any Questions

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