

# Development, Reliability and Validity of the Patient Education Materials Assessment Tool (PEMAT): An Instrument to Assess the Understandability and Actionability of Print and Audiovisual Patient Education Materials

---

*Sarah J. Shoemaker, PharmD, PhD*  
Abt Associates, Inc.



BOLD  
THINKERS  
DRIVING  
REAL-WORLD  
IMPACT

Presentation at the 5<sup>th</sup> Annual Health Literacy  
Research Conference in Washington, DC  
October 28, 2013



# Acknowledgements



- Co-authors:
  - **Michael S. Wolf**, Feinberg School of Medicine, Northwestern University
  - **Cindy Brach**, U.S. Department of Health and Human Services, Agency for Healthcare Research and Quality
- Expert panel members:
  - Geri Baumbblatt, MA
  - Cynthia Baur, PhD
  - Patricia Brennan, RN, PhD
  - Darren DeWalt, MD
  - Robert Mayes, MS, RN
  - Michael Paasche-Orlow, MD
  - Eva Powell, MSW, CPHQ
  - Dean Schillinger, MD
  - Paul Smith, MD
  - Joshua Seidman, PhD, MHS

# Disclosures



- The information upon which this presentation is based was performed under Contract #HHSA2902009000121 "*Improving EHRs Patient Education Materials*" funded by the Agency for Healthcare Research and Quality (AHRQ), Department of Health and Human Services.
- The content of this presentation does not necessarily reflect the views or policies of the Department of Health and Human Services, nor does the mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government. The author [presenter] assumes full responsibility for the accuracy and completeness of the ideas presented.

# Background



- Studies show patient education materials are often poorly understood by patients, especially those with limited health literacy.
- There are a myriad of patient education materials from which professionals (e.g., health librarians, clinicians) must choose.
- Some instruments are available to assess materials:
  - Many readability formulas (e.g., SMOG, Lexile)
  - Few instruments to assess comprehensibility (e.g., SAM, SAM-CAM, Health Literacy INDEX)

# Background



- While several instruments are available, few assess print *and* audiovisual (A/V) materials:



- Actionable information has become recognized as an important aim of patient education materials.
  - No instrument assesses actionability.

# Aim



- To develop a reliable and valid instrument to assess the understandability and actionability of patient education materials.
  - ***Understandability***: Patient education materials are understandable when consumers of diverse backgrounds and varying levels of health literacy can process and explain key messages.
  - ***Actionability***: Patient education materials are actionable when consumers of diverse backgrounds and varying levels of health literacy can identify what they can do based on the information presented.

# Development Approach



- **Stage 1:** Review existing instruments and guides for assessing and developing materials to identify relevant constructs and construct an item pool.
- **Stage 2:** Assess the face and content validity using experts.
- **Stage 3:** Determine the reliability.
- **Stage 4:** Assess the construct validity by conducting comprehension testing with 47 consumers, and comparing understandability results to readability.

# Stage 1: Review Existing Guides



- Identified and reviewed 22 relevant instruments and guides
- Identified 64 potential items, of which:
  - 28 were relevant to understandability
  - 8 items were relevant to actionability

## Stage 2: Face/Content Validity



- Nine experts indicated whether a material's performance on each item would affect its understandability/actionability, discussed results, refined items, and identified gaps.
- We revalidated the items with four experts after developing new items, and refining existing ones.

# Stage 3: Reliability



- We conducted four rounds of reliability testing with multiple untrained lay professional.
- Agreement improved across rounds.
- External consistency of the Final PEMAT:
  - High moderate agreement per Kappa ( $K=0.57$ )
  - Strong agreement per Gwet's AC1 ( $AC1=0.74$ )
- Internal consistency was strong:
  - Cronbach's  $\alpha=0.71$
  - Average Item-Total Correlation= $0.62$

# Stage 4: Construct Validity



- We assessed the construct validity by testing with consumers (n=47).
- Found significant differences between actionable and poorly actionable materials (per the PEMAT) on both consumer testing metrics (76% vs. 63%,  $p < 0.05$ ) and (8.9 vs. 7.7,  $p < 0.05$ ).
- Did not find differences for understandability except for materials on inhaler on one metric.
- Similarly, found correlation between PEMAT scores and consumer testing results for actionability, but not for understandability.

# Stage 4: Construct Validity



- Because the consumer testing results for understandability were limited, we compared results to readability assessments.
- There was a strong, negative correlation between one of the consumer testing metrics and average grade level.
- There was a strong negative correlation between the PEMAT understandability scores and the average grade level for all materials and audiovisual materials, and a very strong negative correlation for printable materials.

# Summary



- Patient Education Materials Assessment Tool (PEMAT):
  - Was developed from existing evidence and repeatedly guided and validated by experts
  - Has strong internal consistency
  - Achieved moderate to substantial agreement, comparable to that of existing instruments
  - Used consumer testing to validate the tool; unlike others
  - Demonstrated to be valid from consumer testing (for actionability) and when compared to readability assessments (for understandability)

# Summary



- Patient Education Materials Assessment Tool (PEMAT):
  - Does not assess comprehensiveness, clinical accuracy or readability; it can be used in conjunction with readability formulas
  - For both audiovisual and print/printable materials
  - For professionals who are making decisions about which materials to share with patients
    - Does not require formal training to use
  - Does not require information beyond the material itself (e.g., how it was developed)

# Final PEMAT Instrument



- Provides an inventory of both desirable and undesirable characteristics of patient education materials.
- Consists of 26 items:
  - Understandability (19 items)
  - Actionability (7 items)
- Most items relevant to both print and A/V materials, but some items are applicable only to one type of material so there are 2 versions of the PEMAT for each type.
- Produces separate numeric scores for understandability and actionability.

# Instrument Versions



- PEMAT User's Guide
  - 60-page User's Guide on how to use the PEMAT; includes examples and explanation for each item; example of visual aids; guidance on how to rate materials
- PEMAT for printable materials (PEMAT-P)
- PEMAT for audiovisual materials (PEMAT-A/V)
- PEMAT Auto-Calculable Form
- Will be available Fall 2013 at:
  - <http://www.ahrq.gov/professionals/prevention-chronic-care/improve/self-mgmt/pemat/>
  - To be notified once it is available, please email me

# Questions?



*Sarah J. Shoemaker, PharmD, PhD*

Abt Associates, Inc.

55 Wheeler Street

Cambridge, MA 02138 USA

Phone: (617) 349-2472

Email: [sarah\\_shoemaker@abtassoc.com](mailto:sarah_shoemaker@abtassoc.com)