# New Short Form for the TOFHLA

Drenna Waldrop-Valverde, PhD

and the FLIGHT/VIDAS team

# Nature of the Problem

The Test of Functional Health Literacy in Adults (TOFHLA)
    One of the most widely used measures of health literacy

    Cutoff scores indicate health literacy levels:
        *Inadequate*
        *Marginal*
        *Adequate*

 Criteria originally used to establish cutoff scores tied to the original population and was not related to external criteria

How then do we detect low health literacy?

# Current methods

**TOFHLA cut-offs:**

Inadequate is less than 50th %ile, adequate above 75th %ile, and marginal in-between

Data from two safety-net hospitals

(*personal communication, J Nurss, October 16, 2014*)

**S-TOFHLA cut-offs:**

Determined by relation to TOFHLA scores

(*Baker et al., [1999] Pat Educ Couns, 38, 33-42*)

**REALM grade equivalent scores:**

Scores based on Slosson Oral Reading Test (n = 203)

"*Please note that patient scores are interpreted as estimates of literacy not grade equivalents*" *p 126*

(*Murphy et al 1993 J Reading, 37, 124-130*)

# Current methods

**Newest Vital Sign cutoffs:**

Based on TOFHLA cutoffs

*(Weiss et al (2005) Ann Fam Med, 3, 514-522).*

**BRIEF self report questions**

Validated against S-TOFHLA

*(Chew et al. (2004) Fam Med, 36, 588-594).*

***Issue:*** **Cutoff scores agree less than half the time**

*Osborn et al. (2007). Amer J Hlth Behav, 31 suppl 3, S36-S46.*

*Haun et al. (2012). J Hlth Commun, 17, 141-159.*

# Validation of Short Version of the TOFHLA

Using a well validated and normed measure of literacy, new short forms of the TOFHLA were developed using a community sample of healthy adults

# Numeracy Items

Factor analytic studies (not presented here) show numeracy items do not assess skills substantially different from the reading comprehension sections

In other analyses (not presented here) numeracy items did not add incremental benefit in detecting those with low health literacy

Given the extra time to administer, the need for "props" and these findings, numeracy items were not included in the following analyses

# Criterion Validation

**Compared to the Woodcock Johnson Test of Achievement**

Nationally-normed achievement tests including reading comprehension

English and Spanish versions calibrated

English norms 8,818 stratified on region, race, gender and other demographic variables

Spanish calibration sample = 1,413 (Mexican, South American, US)

An appropriate gold standard for reading comprehension skills

# TOFHLA Passages & Reading Level

| TOFHLA passage | Content | Gunning Fox Reading Level (Grade) |
|:---:|:---|:---:|
| A | X-Ray Preparation | 4.3 |
| B | Medicaid Rights and Responsibilities | 10.4 |
| C | Hospital Consent Form | 19.5 |

Parker, Baker, Williams & Nurss, 1995

# TOFHLA Passage A

Item difficulty levels on paragraph A are quite low

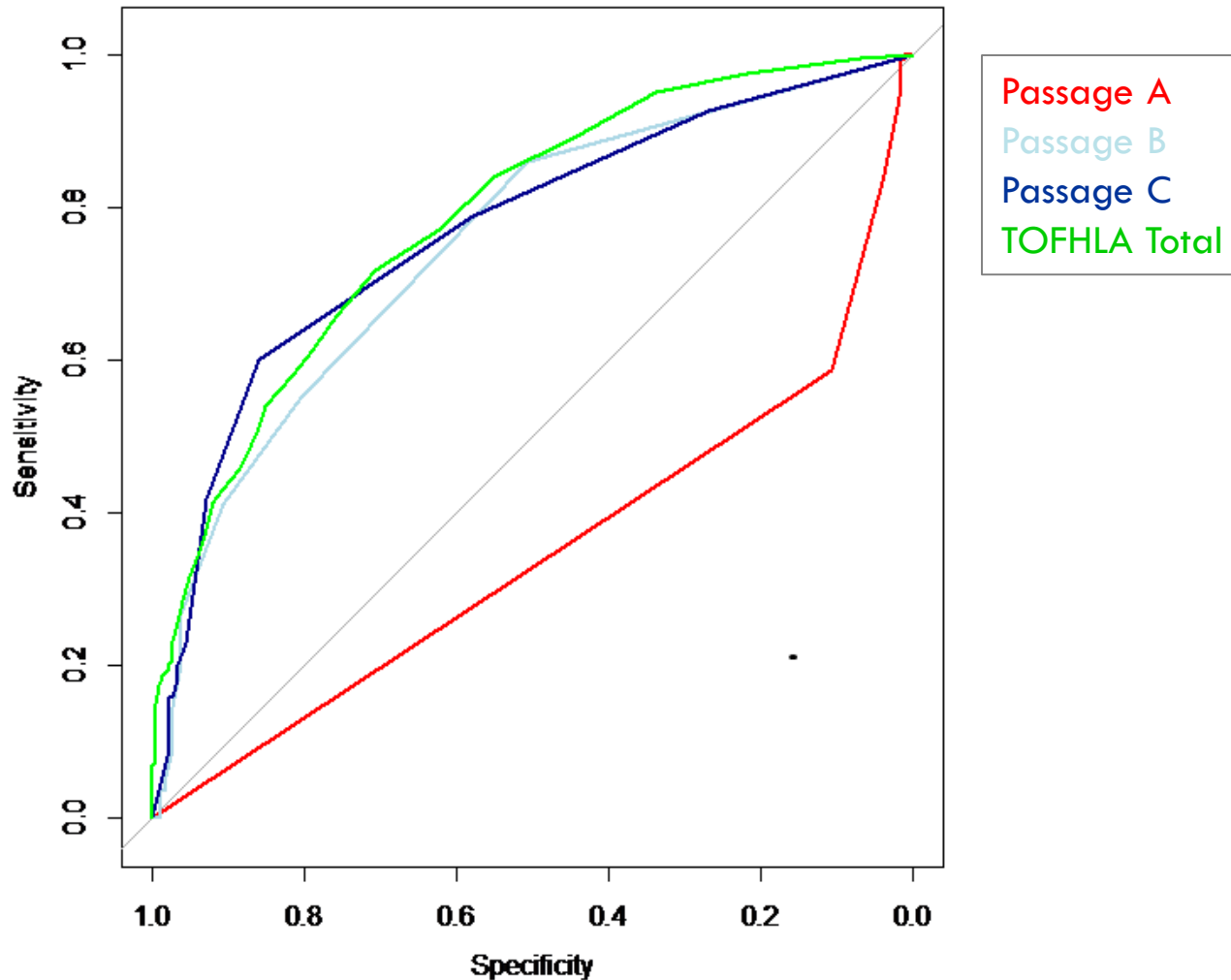>  *Difficulties range from .79 to .87 (% answering correctly)*

Used 8th grade reading level as criterion

Mean differences in scores on paragraph A by reading level are negligible

> *Mean diff is only = 0.49; mean for > 8th grade = **15.77** (sd = 1.54) while mean for < 8th grade = **15.28**, (sd = 1.60); (t = 2.28, df = 206, p = 0.02)*

Suggests paragraph A adds little to the prediction of low literacy/health literacy

# WJ: Passage A, B, C & TOFHLA Total

# Area Under the Curve and ROC Comparisons

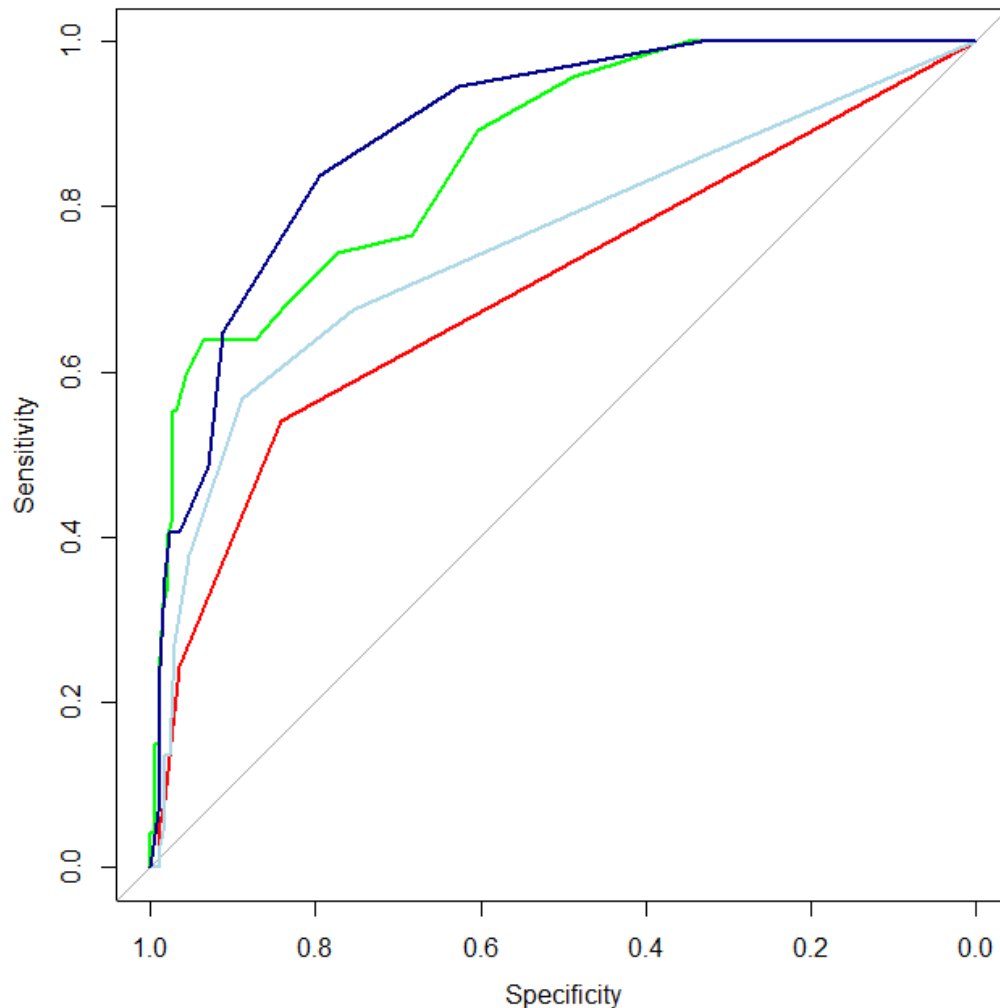| Test Result | Area Under the Curve | ROC comparisons |
|---|---|---|
| TOFHLA A | 0.35 | A vs B<br>D = -11.46, p < 0.001 |
| TOFHLA B | 0.75 | B vs C<br>Z = 0.61, p = 0.54 |
| TOFHLA C | 0.77 | |
| TOFHLA Total | 0.79 | B vs Total<br>D = 1.06, p = 0.29 |

# Recommendation?

| Passage B (cutoff 18.5) | |
| --- | --- |
| Sensitivity | 0.55 |
| Specificity | 0.82 |
| Positive Predictive Value | 0.72 |
| Negative Predictive Value | 0.67 |

| TOFHLA total (cutoff 86.5) | |
| --- | --- |
| Sensitivity | 0.55 |
| Specificity | 0.79 |
| Positive Predictive Value | 0.47 |
| Negative Predictive Value | 0.84 |

*Given the similar performance of passage B to passage C and total TOFHLA and the high reading level of passage C  -* **Passage B** *may be the best choice to detect low health literacy in the shortest amount of time*
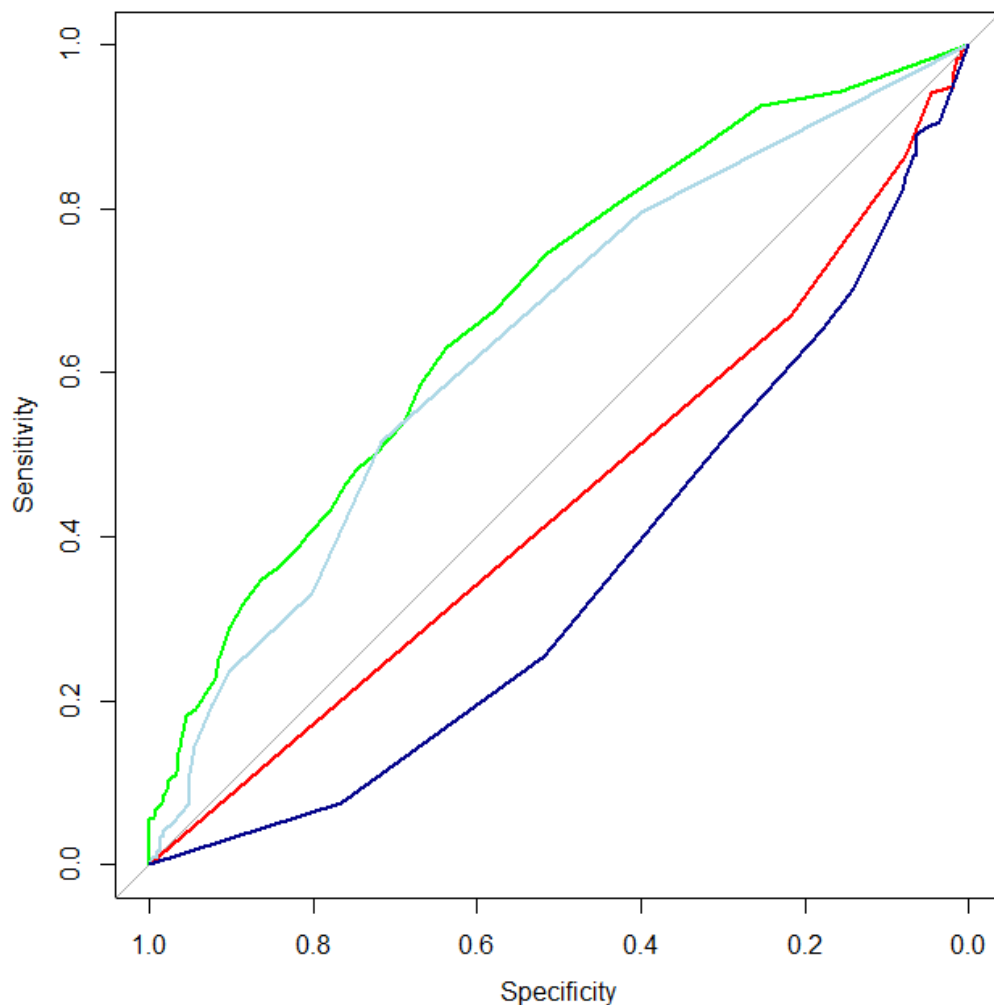
# Validation using REALM/Chew Single Item

# REALM: Passage A, B, C & TOFHLA Total



Passage A
Passage B
Passage C
TOFHLA Total

*REALM scores < 8th grade reading level*

# Chew item "Some Difficulty": Passage A, B, C & TOFHLA Total



**Passage A**
**Passage B**
**Passage C**
**TOFHLA Total**

*"How often do you have problems learning about your medical condition because of difficulty understanding written information?"*

*Never, Occasionally, Sometimes, Often, Always*

**Cutoff at "some difficulty"**

Thank you