

**Oral Abstract Plenary #3: Non-COVID Abstracts  
Tuesday, November 2<sup>nd</sup>, 12:30 pm—1:30 pm ET**

**Prescriber's Understanding of Data Displays of  
Clinical Trial Information: A Systematic Review of  
the Literature**

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**Background**

Healthcare providers (HCPs) often encounter clinical trial results in the form of visual data displays. These displays of clinical trial data can take the form of survival curves, bar graphs or forest plots, to name a few. Although there is a robust literature on patient responses to data displays in medical settings, less is known about how HCPs comprehend complex data displays and apply this information in practice.

**Research Question**

This systematic review of the literature sought to answer the question of how HCPs who prescribe medicine perceive, understand, and use data displays that visually represent clinical trial information about prescription drugs. We also sought literature on best practices for developing data displays that could be applied to prescription drug promotion directed at prescribers.

**Methods**

Using standard systematic review methods, we searched article databases (PubMed, PsycINFO, Web of Science, Cumulative Index to Nursing and Allied Health Literature, the Cochrane Library) supplemented by handsearching to identify articles meeting study criteria and published in English from 1990-2020. One reviewer abstracted data and the study lead checked for accuracy.

**Results**

We identified 15 articles meeting our study criteria. Studies with physicians were more prevalent (13/15) than those with other prescribers (6/15). Types of data in the displays were varied and included risk of adverse events, survival, health-related quality of life, and treatment benefit. We identified only one study of displaying data from a meta-analysis (i.e., forest plot) and none that assessed visual communication of statistical uncertainty concepts (e.g., confidence intervals.) Common study comparisons were type of visual display (e.g., icon array versus other format) and

visual display compared with narrative text; less common comparisons included varied length of time, framing (positive versus negative), additive effects (one display versus two), and stylistic data display elements (e.g., shading, colors). Studies also varied regarding the medical condition that was the subject of the study, with a slight focus (5 of 15) on cancer. Commonly assessed outcomes included objective (10/15) and subjective comprehension (4/15) of information, preference of type of display (6/15), and hypothetical prescribing or decision-making (4/15). In studies that assessed comprehension of clinical trial terms or calculations, scores generally were low to moderate (<50% accuracy). Data display formats that were preferred did not always correlate with better comprehension of information; less preferred formats (e.g., icon array) often resulted in better comprehension. Experimental manipulation of certain data display characteristics (such as 5-year versus 1-year time frames) influenced decision-making in four studies, but all assessed hypothetical practices.

**Conclusions**

Literature on prescriber understanding of visual displays of clinical trial data was scant, suggesting an understudied area. Limitations in understanding of certain clinical trial concepts were evident, although it is unclear how this influences actual decision-making.

**Implications**

Best practices may be useful for developing visual data displays that accurately and effectively communicate information to healthcare providers who prescribe medications. We discuss recommended practices based on our review and identify areas for future research.

**Asthma Education for High-Risk Patients Decreases  
Acute Healthcare Utilization for Asthma**

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**Background**

Children visiting the emergency department (ED) or hospitalized for asthma exacerbation likely return for acute care in the following year. Low literacy asthma education interventions are effective at reducing future ED use. However, few interventions have been distributed in the ED and hospital, and none using a quality improvement approach.

## Research Question

Does health literacy-focused asthma education given to families of children seeking acute care for asthma decrease the odds of return visits to the ED or hospital for asthma exacerbations?

## Methods

This retrospective analysis evaluates outcome data of a quality improvement project to increase health literacy-focused asthma education distribution for patients with an asthma exacerbation. The English and Spanish education included topic areas defined by national organizations in written and video formats. Through quality improvement methods, ED patients and families receiving asthma education improved (28% to 52% written; 0 to 32% video) in the implementation period May 2018-May 2019. Hospitalized patients and families in targeted units received improved asthma education, with improvement in videos from 0% to 42%, but no change in written education (61%) during the implementation phase March 2019-July 2019. Patient demographics and family education at the index visit were captured for this analysis. Outcome measures included ED visits and hospitalizations with a primary or secondary diagnosis of asthma exacerbation for 365 days following the index visit. Statistical analysis comparing the groups with vs. without education was completed using Generalized Estimating Equations for data January 1st 2017-April 1st, 2020. The 365-day follow-up period was truncated due to COVID for patients after April 1st, 2019, and the number of return visits prorated for one year.

## Results

3547 children included in the analysis were seen for 7425 visits in the ED (5065) and hospital (2360) for asthma exacerbations. 33% of ED visits led to hospitalization. 61% of children were male, 37% white, 60% black, 3% other, and 15% Hispanic. 5% of patients or families preferred a language other than English, with a majority Spanish (4%) and 74% had public insurance. Most patients/families screened as having adequate health literacy using the Chew et. al. question (86%). Return visits for each subject ranged from 1-30. ED patients discharged home had lower odds of return visits if they received written (OR=0.82, 95% CI 0.70 – 0.96, p=0.013) or video (OR=0.77, 95% CI 0.63 – 0.95, p=0.014) education. This was not similar for admitted patients. There were no significant differences in the odds of return visits after written education.

## Conclusions

Providing inclusive asthma education in the ED can decrease the likelihood of future ED visits or hospitalizations for asthma exacerbation. The lack of impact in hospitalized patients may relate to the difficulty with follow-up data evaluation due to COVID impact.

## Implications

An ED visit for acute disease exacerbation may be an opportunity for health literacy-focused education interventions to impact high-risk populations.

### Measuring Health Literacy in Rhode Island

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## Background

Efforts to increase health literacy have gained global momentum. The US Healthy People 2030 objectives include six targets to improve health literacy among adults and healthcare providers. The association between limited health literacy, inadequate access to health care, and poor health outcomes demonstrates the need for better patient-provider partnerships. Advancing health literacy includes determining assets and gaps in health literacy skills in individuals, populations, healthcare workforce, and healthcare systems. A comprehensive approach to measuring health literacy levels can guide more successful interventions to build health literacy capacity and empower individuals to take charge of their health. This study measured health literacy levels and captured patients' experiences receiving care at Federally Qualified Community Health Centers (FQCHC) in Rhode Island.

## Methods

Three hundred and twenty-eight participants at two RI FQCHCs completed a cross-sectional survey assessment of patients' health literacy skills and experiences. The instrument included three measurement tools: the Brief Health Literacy Screening Tool (BRIEF), the Short Assessment of Health Literacy-Spanish and English (SAHL-S&E), and the All Aspects of Health Literacy Scale (AAHLS). Participants were recruited at the health

centers, and trained students collected the data. SPSS statistical software and NVivo were used for data analysis.

## Results

Limited and marginal health literacy was found in 18% and 31% of the participants using BRIEF. The relationship between Race ( $p=.002$ ), HLS (Hispanic, Latino, Spanish) origin ( $p=.001$ ), education ( $p < 0.001$ ), residence ( $p=.014$ ), and health status ( $p=.008$ ) with BRIEF levels were statistically significant. Whites and those of non-HLS origin were more likely to have adequate health literacy levels. Limited health levels were found among those who rented, had a high school degree or less, or reported poor health status. Limited health literacy was found in 20% of the participants using SAHL-S&E. The relationship between race ( $p=.003$ ), HLS origin ( $p < 0.001$ ), and education ( $p < 0.001$ ) with SAHL level were statistically significant. The 3 AAHL subscales revealed limited functional health literacy in 23% of the participants and limited critical health literacy in 25%. A majority of participants reported confidence in accessing health information to make good health decisions (90%). Reported health status revealed approximately 33% reporting poor, 41% reported good, and 25% reported excellent health.

The study revealed that access to information and resources, better communication, engaging patients, and support systems could assist in good health decisions. Additional outreach, educational resources, and doctor/patient interaction were also reported. Approximately 43% preferred multiple methods to receive health information (online, in-person, etc.).

## Conclusions/Implications

These results not only suggest a deeper dive into understanding limited health literacy risks in RI but a need for educational interventions, improved communications, and additional training for healthcare employees. By capturing and including personal experiences when delivering health promotion and patient education, we can focus more on individual needs. The use of three health literacy measures identified different results and suggests merit in assessing health literacy in multiple ways.

## Addressing health literacy in patient decision aids: an update from the International Patient Decision Aid Standards

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## Background

Patient decision aids (PtDAs) are tools designed to help people participate in decision making about health care options, providing information on the options and helping patients clarify and communicate their personal values and preferences. There is increasing recognition of the importance of addressing health literacy in PtDA development.

## Objective and methods

As part of an update of the International Patient Decision Aid Standards, the aim of this study was to conduct a review to examine the extent to which PtDAs are designed to meet the needs of lower health literacy/socially disadvantaged populations.

We searched the reference list of the Cochrane reviews of randomised controlled trials (RCTs) of PtDAs (2014, 2017 and upcoming 2021 versions) and included RCTs that assessed the impact of PtDAs on people with lower health literacy or other socially disadvantaged groups (i.e.  $\geq 50\%$  participants from socially disadvantaged groups and/or subgroup analysis in socially disadvantaged group/s). Two researchers independently extracted data into a standardized form including PtDA development and evaluation details. We searched online repositories and emailed authors to access PtDAs to verify reading level and understandability and actionability using the Patient Education Materials Assessment tool.

## Results

Twenty-five out of 213 RCTs of PtDAs met inclusion criteria for our study, illustrating that only 12% of studies specifically addressed the needs of lower health literacy or other socially disadvantaged groups. Reading age was calculated in 8/25 studies (33%), which is recommended in previous IPDAS guidelines. We accessed and independently assessed 11 PtDAs. None were written at 6th grade level or below. Ten PtDAs met the recommended threshold for understandability, but only 5 met the recommended threshold for actionability. We also conducted a post-hoc subgroup meta-analysis and

found that knowledge improvements after receiving a PtDA were greater in studies that reported using strategies to reduce cognitive demand in the PtDA development compared to studies that did not (Chi2=14.11, p=0.0002, I2=92.9%).

### **Conclusions**

Greater attention to health literacy and socially disadvantaged populations is needed in the field of PtDAs to maximize equity in decision support.