Personalizing Outcomes Measures to Effectively Assess Impact of SSc-ILD Education

Academy for Continued Healthcare Learning

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Abstract

Online education creates access to a heterogenous mix of clinicians, varied by specialty, discipline, experience, practice setting and geography, as well as acumen levels. Despite this diversity, outcomes questions are typically considerate of a "typical" learner within the primary target audience. When clinicians outside of this narrow audience participate in an activity, the questions aren't optimally aligned to their role in the patient management experience and consequently, their lower scores depress both baseline and post intervention outcomes levels. Although other CME outcomes may segment learner responses by varied demographics, they are still one-dimensional. And while the use of standardized testing facilitates the administration, scoring and interpretation of outcomes data in a consistent way, it often fails to reflect real world circumstances in which the educational content is applied, undermining the impact of the education and providing spurious conclusions. A personalized outcomes approach improves learner alignment thereby strengthening the agreement between expectations in learner performance with the assessment technique used to measure those expectations.

Introduction

Systemic sclerosis (SSc) is a disfiguring, disabling and potentially fatal rare disease that causes scarring of the skin (scleroderma), lungs (SSc-ILD) and other organs. ILD is the leading cause of mortality in SSc, accounting for nearly 35% of all SSc-related deaths. (Tyndall 2010) Given the poor prognosis of SSc-ILD, patients with SSc should receive screening and frequent follow-up to detect lung involvement. Moreover, although an accurate, early diagnosis is critical for prompt, appropriate management, SSc-ILD patients often experience delays in receiving a diagnosis and initiation of therapy.

To extend survivability and improve the QoL for these patients, education must support improvements in differential diagnosis and appropriate application of pharmacotherapy, considerate of a multidisciplinary team. While the goals and educational content across these audiences is universal, we recognized the way in which each learner type would apply this knowledge varies based on area of practice. For example, improving the differential diagnosis process by a primary care physician could differ from that of a pulmonologist or rheumatologist, as each employ different clinical, patient and/or radiologic features to move towards diagnosis.

Methods

Our educational outcomes utilized a personalized methodology to support precision-based analytics—choosing measures of success aligned with each learner's scope of practice. Unlike traditional activities where outcomes questions are considerate of a "typical" learner within the primary target audience, we used AI technologies to index and populate questions based on the unique learner profile.

This approach afforded us the opportunity to segment learners based on expectations for improvement relative to their role in managing SSc-ILD patients and protect against unnatural depression (or inflation) of pre and post test scores. Even when the content is static and not personalized, the outcomes questions can be by delineating key knowledge points and considering how each different learner type might employ this knowledge in a clinical setting.

Case: EJ is a 48-year old woman newly diagnosed with SSc based on Raynaud's phenomenon and positive serologies. Her cardiovascular exam was normal, but she complains of dry cough and shortness of breath.

To improve earlier diagnosis, what do we need to happen? How is this achieved at a primary care level versus within specialty setting?

Pulmonology Question regarding case	*Non-Pulmonlogy Question regarding case*
Which of the following would you order to assess her lung impairment? A. Chest x-ray B. Pulmonary function tests C. HRCT D. Six-minute walk test	Which of the following clinical findings would lead to a high suspicion of pulmonary fibrotic changes indicative of ILD in this patient? **A. Crackles** B. Finger clubbing C. Mucus production D. Wheezing
Expected Outcome: To improve earlier recognition of ILD, Pulmonologists will recognize that pulmonary function tests may not correlate with a diagnosis of SSc-ILD and that while a chest x-ray can show lung abnormalities, a more detailed image from HRCT is needed to see the specific pattern of abnormalities and make a definitive diagnosis.	*Expected Outcome:* To improve earlier diagnosis of ILD, PCPs will recognize that early identification of "Velcro" crackles during lung auscultation is an early finding of pulmonary fibrosis in other ILDs, such as idiopathic pulmonary fibrosis.

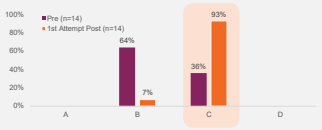
Results

Goal : To improve patient prognoses through the timely and accurate differential diagnosis of SSc-ILD

Pulmonology Learner Performance

EJ is a 48-year old woman newly diagnosed with SSc based on Raynaud's phenomenon and positive serologies. Her cardiovascular exam was normal, but she complains of dry cough and shortness of breath. Which of the following would you order to assess her lung impairment?

A. Chest x-ray
B. Pulmonary function tests
C. HRCT
D. Six-minute walk test



Non-Pulmonology Learner Performance

EJ is a 48-year old woman newly diagnosed with SSc based on Raynaud's phenomenon and positive serologies. Her cardiovascular exam was normal, but she complains of dry cough and shortness of breath. Which of the following clinical findings would lead to a high suspicion of pulmonary fibrotic changes indicative of ILD in this patient?

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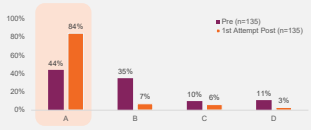


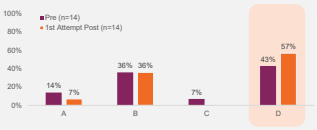
Both groups of learners demonstrated marked increases in competence with components of an ILD diagnosis. Pulmonology learners recognized the need for HRCT over PFTs, and non-pulmonology learners demonstrated increased recognition of crackles, an early sign of ILD. The latter may translate into improved recognition of ILD across diverse patients and practice settings.

Goal : To improve knowledge of new and emerging therapies for SSc-ILD

Pulmonology Learner Performance

The SENCSIS clinical trial in patients with SSc-ILD revealed a significant decrease in:

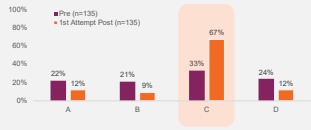
A. Relative declines from baseline in FVC in patients receiving pirfenidone
B. Rates of decline in FVC in patients receiving a combination of pirfenidone and mycophenolate
C. Mortality rates with nintedanib
D. The annual rate of change in FVC in patients receiving nintedanib



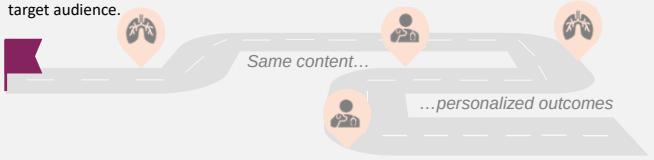
Non-Pulmonology Learner Performance

In the recently reported SENCSIC trial, the efficacy of nintedanib in patients with SSc-ILD was demonstrated using the primary efficacy endpoint of:

A. Change in total St. George's Respiratory Questionnaire score
B. Low diffusing capacity
C. Decline in forced vital capacity
D. All-cause mortality



Both groups of learners demonstrated increased awareness of the SENCSIS clinical trial and its endpoints, an important measure since the therapy investigated in the trial received FDA approval as the first therapy for SSc-ILD shortly after the activity launched. Despite improvement, 43% of pulmonology learners continued to demonstrate a knowledge gap with the primary efficacy endpoint of the trial, suggesting a need for continued education for this target audience.

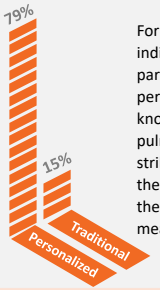


Results Cont.

To further isolate the success of this education and the impact of the personalized outcomes methodology, the outcomes data from this activity was compared to another SSc-ILD activity that had comparable measures in identical audiences, but through use of a traditional outcomes approach, i.e., questions that were audience agnostic. When comparing measures of the effectiveness, we see the following aggregated results, differentiated by learner audience:

	Pulmonology Learners		*Non-Pulmonology Learners*	
	Cohen's *d* Effect Size	Percent of Non-Overlap	Cohen's *d* Effect Size	Percent of Non-Overlap
Traditional Outcomes	0.20 (n=72)	15%	0.35 (n=587)	24%
Personalized Outcomes*	1.88 (n=14)	79%	1.12 (n=135)	60%

** data representative of 3 months of learner activity post-launch*



For purposes of interpreting these outcomes, percent of non-overlap indicates how much more knowledgeable learners were following participation in the activity. In the activity that employed the personalized outcomes strategy, pulmonology learners were 79% more knowledgeable following the intervention (pre to post) while non-pulmonology learners were 60% more knowledgeable. These results are striking when considering outcomes from the traditional activity, where the same set of measures were used to assess all learners irrespective of their role in managing these patients. In this model, the percentages measuring impact/improvement were significantly lower.

Conclusion

Despite the heterogenous mix of clinicians that participation in online education, outcomes questions are typically static. When clinicians outside the target audience participate in an activity, the questions aren't optimally aligned to their role in the patient management experience and consequently, their lower scores depress both baseline and post intervention outcomes levels. Although other CME outcomes may segment learner responses by varied demographics, they are still one-dimensional. And while the use of standardized testing facilitates the administration, scoring and interpretation of outcomes data in a consistent way, it often fails to reflect real world circumstances in which the educational content is applied, undermining the impact of the education and providing spurious conclusions. A personalized outcomes approach improves learner alignment thereby strengthening the agreement between expectations in learner performance with the assessment technique used to measure those expectations.

This practice, coupled with improved data analytics and reporting (eg, weighting, paired analysis, better alignment between measures/questions and expected outcomes, and inclusion of first-attempt post test data), gives commercial supporters greater confidence in the outcomes of funded education and tells a more compelling story that can be shared with their leadership and inform strategic decision making.

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