

Introduction

Patient-reported outcomes, traditionally collected only in research study protocols, have now become a standard of care clinical endpoint. To review and assess longitudinal, electronic patient reported outcomes (ePRO) results at the point of care and in semantic context of the patient's health status, a critical component is access and integration of ePRO applications into a hospital's Electronic Health Record (EHR) System.

A major development to standardize this process has been the SMART on FHIR® API, allowing for innovative health apps to be successfully integrated and run throughout the healthcare system. This advancement, led by the 21st Century Cures Act, has allowed major EHRs to begin creating their own app marketplaces to encourage development of apps on their own platforms, which has accordingly led to large number of apps available on EHR app marketplaces—like EPIC's App Orchard.

The purpose of this abstract is to share that experience and the process to integrate a broad-use ePRO application into multiple electronic medical record systems.

Methods

Visiontree is implemented at over 600 sites including 17 of the top 20 U.S. News and World Report Hospitals there is a turnkey solution for delivering standards-based, outcomes treatment pathways with a library of 400+ pre-built validated outcomes assessments, including all ICHOM standard sets. In particular, the Visiontree ePRO application is used by collaborative research groups and registries in the fields of oncology, neurological, orthopaedic, colorectal surgery and behavioral health including NRG Oncology, RTOG, AAOS/AJRR and nationally with Patient-Centered Outcomes Research Institute (PCORI) in fields of prostate and breast cancer.

After more than a decade in clinical and research use, Visiontree is available within the Epic® App Market. This integration provides options for both a Care Team initiated workflow to assign ePRO to a patient's record and Event-Driven automated, treatment pathway zero-staff workflows for completion of all forms electronically for a completely digital patient journey for transition of care and multidisciplinary group access to longitudinal patient reported outcomes results.

Visiontree features of kiosk-mode with QR code for completion on tablets or patient's own smartphone device at point of care, as well as forms compliance and analytics tools to optimize patient compliance, as well as monitoring toxicities to alert clinicians when a threshold value is met, delivering patient education and scheduling telehealth visits for each specialty and setting of patient care, including ePRO-based remote patient monitoring such as Patient-Centered Home and Enhanced Oncology Model (EOM) programs.

Visiontree ePRO UI deliver optimal patient experience using FHIR® for interoperability and data standards of USCDI®, SNOMED® and LOINC® using standards-based interfaces with the market leading Epic® and Cerner® EHRs.

As healthcare moves into a field of data science and data lakes to deliver personalized, patient-centered treatment pathways, patient reported outcomes collected with FHIR® interoperability and in semantic context of a patient's health status and help clarify the benefits of active interventions and integrate effectively with AI, machine learning and predictive modeling solutions.

Results

It has been demonstrated that with Visiontree, there is a modular application which provides the ability to integrate with leading EHR systems, including Epic and Cerner, to make PRO a standard of clinical care.

Conclusions

Electronic patient reported outcome tools helps us better measure interventional impact of the patient's functional performance and quality of life after the hospital stay while managing patient care outside of the traditional clinical setting. Additionally, PROs play a significant role in randomized clinical trials as they have been used as primary endpoints. We expect this data collected for AI will be more broadly adopted across all fields of specialty care.