Management of Oncology Patients Can Be Improved Using Continuous Temperature Monitoring, and Electronic Patient Reported Outcomes Innovations

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ABSTRACT

BACKGROUND

Continuous temperature monitoring (CTM) identifies fever earlier than the standard of care[1] and symptom detection and documentation is improved using electronic Patient Reported Outcomes (ePRO)[2]. CTM includes a wearable patch that broadcasts temperature data to an application on a patient's smartphone, while healthcare providers can view data on a HIPAA-compliant web portal. ePRO digital health software focuses on understanding and improving the cancer patient experience through patient reporting of common symptoms such as pain or anxiety and is easily accomplished through a friendly question-response format delivered directly to the patient's device. Dashboard visualizations of ePRO data are readily accessible for clinician review. Patient engagement improves with the use of ePROs which can, in turn, improve clinical efficiencies and outcomes.[2] Earlier, faster, data-informed patient interventions can potentially reduce healthcare-related costs.[2]

OBJECTIVE

Explore the value and efficiencies of continuous temperature monitoring and a symptom data set for patients at risk for febrile neutropenia (FN).

METHODS

Health and symptom questions distributed via an ePRO platform are based on validated measures and designed to be answered using a patient smart device or web browser. Patients will enter symptom data at baseline, daily during their nadir, and weekly for a period appropriate to their treatment experience. They will also monitor their temperature using CTM during the nadir, typically days 7-14 following treatment. We intend to accrue 20-30 patients across 5-6 oncology centers. Post-experience interviews will gather feedback on the value of CTM data in conjunction with ePRO monitoring from both clinician and patient perspectives. The data will be analyzed using standard qualitative research methodologies.

RESULTS

Data collection is in progress, with an expected completion date of March 2023. We believe combining CTM and ePROs in patients at risk for FN will improve identification and triage of patients experiencing symptoms by facilitating timely and efficient clinician assessment and intervention. For example, identifying symptoms that require assessment, such as fever and cough, could allow for the prioritization of a fever workup to determine cause and appropriate level of care.

CONCLUSION

We expect that this pilot study of FN patients will provide additional information about clinical decision-making for FN. CTM and ePRO data obtained from new digital health technologies have the potential to improve patient experiences, clinical outcomes, and clinician workflows. The outcomes of this pilot will inform a more extensive study that seeks to identify areas of improved health and economic benefits due to the incorporation of CTM and ePROs.

FEBRILE NEUTROPENIA

> In a study presented at the NCCN Annual Conference, Wang stated, "Patients treated with intermediate-risk regimens had a higher likelihood of FN than those given high-risk regimens (odds ratio: 1.6, 1.7, 1.8 for main, sensitive, and specific definitions, respectively; all P <.05)."[3]

> The American Society of Clinical Oncology and an International guideline Panel of the Surviving Sepsis Campaign recommend administering the first dose of empiric antibacterial therapy as soon as possible after triage (within 1 hour) to patients with febrile neutropenia[4]

> About 50% of patients with febrile neutropenia will develop an infection, of which 20% with profound neutropenia will develop bacteremia.[5]

HEALTH EQUITY & ACCESS

According to the National Academies Future of Nursing report, nurses are key drivers in achieving health equity because they

- Have a diverse, large, integrated workforce
- Focus on preventative person-centered care
- Have an orientation towards innovation
- Work in new settings in new ways
- Engage in complex work to improve well-being at individual, family, and community levels
- Help to ensure that individuals receive equitable health care services

EPRO'S

Carevive PROmpt® is a remote symptom monitoring and ePRO assessment tool that brings questions to patient via their mobile device or computer and records the responses into EMR integrated dashboard displays for personalized clinical care

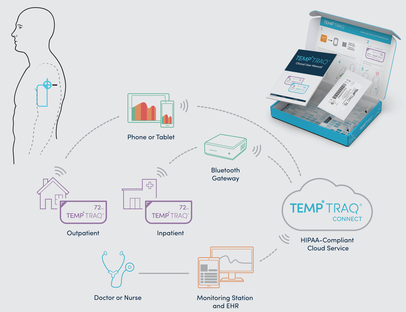
Patient Reported Outcome measures empower patients to rate their own symptom toxicity, side effects, and other care concerns (PRO-CTCAE, PROMIS)

Potential health improvements related to ePRO use include quality of life enhancement, reduced acute care visits, and extended overall survival

CONTINUOUS TEMPERATURE MONITORING

TempTraq is an FDA Cleared Class II medical device that gives Healthcare providers the first wireless continuous temperature monitor in the form of a soft, comfortable, disposable patch. TempTraq can significantly improve the way temperature is measured in the clinical environment and provide clinicians with a quicker, easier, and more effective way to measure temperature.

- Tested with Adults in ICU - showed TempTraq to be in agreement with Pulmonary Artery Catheter
- BMT and CAR-T patients; Fevers caused by infections were detected significantly earlier (median = 18.5 h); HFTM provides considerable lead time (median 4.9 h earlier than SOC) for early detection of febrile adverse events.

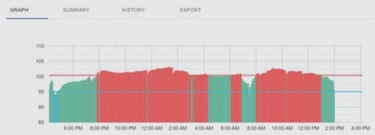


CASE STUDY

> 52 year old male with DLBCL at risk for febrile neutropenia related to standard of care treatment pathway
> - Wore the TempTraq patches and completed daily ePRO assessments during the at-risk period
> - Completed ePRO assessments for a period of 8 weeks, allowing trending views of at-home self-reported symptom and fever data
> - Post-experience surveys pending for clinician and patient

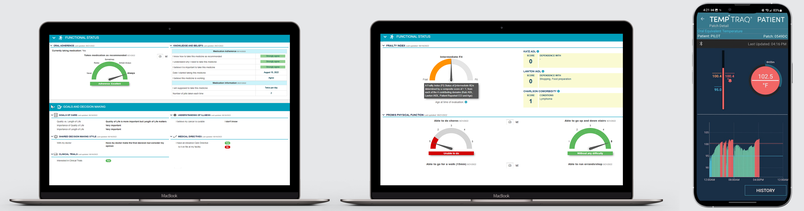
TempTraq data shows a low-grade temprature when the patient began documenting chills

TempTraq data shows a persistent fever when the patient began documenting a fever



> Care teams receive unprecedented support in understanding the patient's experience through the data displays generated by the patient's answers to ePRO questions and the use of a CTM device.

> Through the Illumination of real-world patient experience in at-home response settings, the patient voice becomes data informing personalized care decisions.



SUMMARY

Innovations in technology and synthesis of these data allow for new insights into the management of oncology patients at risk for experiencing febrile neutropenia which can be used to improve the quality of care provided.

The data provides a patient-centric understanding of the experience of oncologic illnesses within and throughout diagnosis while highlighting potential areas for patient education and early intervention

Pilots, as well as larger studies, are important to conduct in order for healthcare teams and organizations to understand the effort and value related to workflows, intervention protocols, and patient education that technology can now support

Download the poster and submit feedback or questions

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