

Factors associated with adherence to remote patient monitoring during radiation treatment for head and neck cancer

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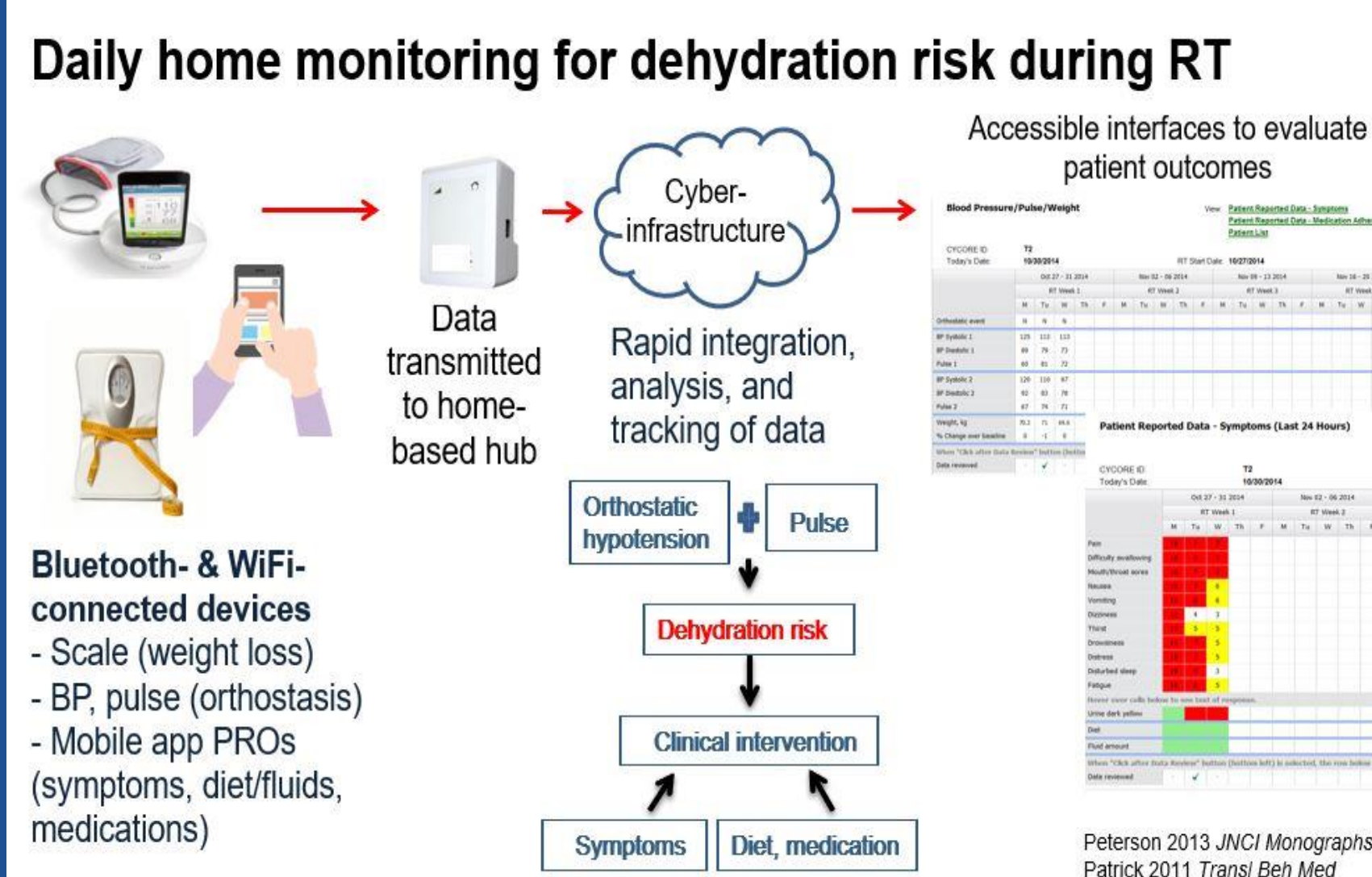
Introduction

- About 80% of head and neck cancer (HNC) patients who receive radiation treatment (RT) experience mucositis and other symptoms that impact eating and drinking. As such, dehydration risk is increased during RT, causing hospitalization in one-third of patients.
- The CYCORE system used mobile and sensor technology to remotely monitor blood pressure/pulse, weight, and patient-reported outcomes in HNC patients daily during RT (Figure 1).
- Clinicians reviewed patient-generated data daily via a web portal (Figure 1) to evaluate dehydration risk and intervened when medically necessary.
- The ability to detect dehydration risk through remote patient monitoring (RPM) depends on patients' adherence to daily monitoring requirements. Adherence may be influenced by factors such as symptom burden, engagement with technology, and perceived utility of daily monitoring.

Study Aim

Evaluate the association between HNC patients' adherence to daily remote monitoring and symptom burden, patient engagement, and perceived utility of monitoring.

Figure 1. CYCORE provided a platform for mobile and sensor data collection and storage. User interface displayed daily blood pressure/pulse and weight, and indications for orthostatic hypotension.



Participants and Methods

- Eligibility:** HNC diagnosis; receiving bilateral RT; age ≥ 18 years; English proficient; Zubrod score ≤ 2 ; no prior dysphagia or RT.
- Patients were recruited at start of RT and randomized to CYCORE + usual care, or usual care only.
- Measures:** MD Anderson Symptom Inventory-HN (MDASI-HN); Patient Activation Measure (PAM); Perceived Device Usefulness.
- Statistical methods included longitudinal analysis to compare the relationship between daily monitoring adherence and symptom burden (MDASI-HN), patient engagement (PAM), and perceived utility (device usefulness) in patients randomized to CYCORE.

Results

Table 1. Demographic characteristics of patients randomized to CYCORE

Demographic characteristic	CYCORE (n=169)
Age, yrs. mean (range)	59 (25-86)
Sex, Female %	19.9%
Race/Ethnicity, White	87.2%
Married, %	90.6%
Has Caregiver, %	86.7%
<=High school graduate	25.0%
Some college, other	26.0%
>=Bachelor's degree	49.0%

Table 2. MD Anderson Symptom Inventory-Head & Neck

	RT Start	RT Completion	6-8 Weeks Post-RT	RPM Adherence (p-value)
MDASI items (0-10 range)	CYCORE (M, SD)	CYCORE (M, SD)	CYCORE (M, SD)	CYCORE (M, SD)
Severity (General) ¹	1.18, 1.34	2.99, 1.51	1.74, 1.34	0.018
Severity (HNC) ²	0.79, 1.16	4.22, 1.80	1.80, 1.50	0.043
Interference ³	1.32, 1.81	3.22, 2.30	1.93, 2.04	0.038

Table 3. Patient Activation Measure

PAM Activation Level	% of Study Participants	% RPM adherence (M, SD)
Believing activation is not important	4.5	75.05, 23.18
Lacking confidence and knowledge to take action	8.1	79.29, 22.00
Beginning to take action	28.5	83.15, 17.30
Taking action	58.9	83.13, 16.67

p = 0.242

Table 4. Percent Perceived Device Usefulness

Patient Perceptions	% responding mostly/extremely	RPM Adherence (p-value)
Device Usefulness		
Symptom Management	39.9	0.599
Early Problem Detection	41.4	0.717
HCP Illness Monitoring	49.4	0.220
Feeling of Security	46.7	0.032

Results (cont.)

- Most participants were male, White, and married (Table 1).
- As **symptom severity** and **interference with daily living** increased, adherence to remote monitoring decreased (Table 2).
- No significant correlation between **Patient Activation Measure (PAM)** and adherence to remote monitoring was found (Table 3).
- No significant association between overall **perceived usefulness** of CYCORE devices and adherence to remote monitoring was found, except for a single item indicating perceived feeling of security (Table 4).

Conclusions

- Although a benefit of RPM may be early detection and mitigation of symptoms during cancer treatment, higher symptom burden may interfere with RPM adherence. This finding may have implications for clinical implementation of RPM.
- PAM scores indicated that patients may demonstrate higher levels of patient activation in general, which may account for the non-significant correlations.
- Better adherence to RPM may be attributed to patients' perceiving a sense of security from daily monitoring and may suggest a potentially important value that patients gain from RPM.
- Understanding factors that impact patient adherence to RPM may help improve acceptability and clinical utility of RPM in oncology.

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