ABSTRACT TITLE: WEARABLE FITNESS TRACKERS FOR MEASUREMENT OF BEHAVIORAL PATTERNS AMONG PATIENTS UNDERGOING RADICAL CYSTECTOMY: A PILOT STUDY ASSESSING FEASIBILITY AND UTILITY

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Background/Introduction: Radical cystectomy (RC) is a complicated procedure associated with significant morbidity and lengthy recovery. Wearable fitness trackers (WFT) offer a novel means of objectively evaluating and quantifying patient behavioral patterns. We sought to determine capacity for use of these devices to measure patient sleep and activity levels in the perioperative setting.

Methods: Under IRB approval, commercially available WFT devices were obtained. Patients undergoing open or robotic RC were prospectively identified. Consenting patients were given a WFT and instructed to wear continuously up to 2 weeks preoperatively, in the immediate postoperative period, and up to 2 weeks after discharge until first follow-up visit. Activity was automatically recorded and measured including total daily steps, calories burned, and sedentary hours. Sleep outcomes included total daily hours asleep and number of awakenings while sleeping. Day of first bowel movement postoperatively was also recorded.

Results: 21 patients were given a WFT for a median of 15 days total (IQR 10-21). Median age was 69 years old (IQR 69-80). Results of captured data are shown in Table 1. Compared to preoperative daily steps, patients reached 11.2% of their baseline on the day prior to discharge and patients averaged 17.6% of preoperative baseline after discharge. When stratifying by those 80 years and older, younger patients had significantly more daily inpatient steps (p=0.036) and postoperative daily calories burned (p=0.028), as well as greater total steps on day prior to discharge (p=0.079). Decreased daily inpatient steps were associated with return of bowel function on postoperative day 3 or later (9% of patients above average daily inpatient steps delayed vs 50% of patients below average delayed, p=0.038).

Conclusion: Use of WFT to objectively measure patients' activity, sleep, and other physiologic variables is feasible. Patients younger than 80 years old show increased activity levels in the postoperative setting. Ongoing prospective evaluation will provide further insights into patient functional status with implications for risk stratification, discharge planning, and perioperative management among patients undergoing radical cystectomy.

Funding Source: Southern California Clinical and Translational Science Institute

Table 1. Daily means of activity and sleep variables.

Variable	Preoperative	Inpatient	Postoperative
Steps	4,806 (SD: 2,647)	898 (SD: 1,792)	1,517 (SD: 2,043)
Calories burned	2,327 (SD: 1,166)	2,129 (SD: 1,193)	1,776 (SD: 686)
Sedentary hours	14.78 (SD: 4.45)	12.63 (SD: 5.19)	17.84 (SD: 4.19)
Hours asleep	5.26 (SD: 1.77)	6.99 (SD: 3.24)	4.90 (SD: 2.90)
Awakenings per hour asleep	2.27 (SD: 1.39)	0.86 (SD: 0.67)	1.46 (SD: 1.28)