

**Overcoming Disparities: Multidisciplinary Breast Cancer Care at a Public Safety-Net Hospital**



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**INTRODUCTION:** Public safety-net hospitals (SNH) serve a disparate patient population; however, little is known about long-term oncologic outcomes of patients receiving care at these facilities. This study is the first to examine overall survival (OS) and its associated factors in breast cancer patients treated at a SNH.

**METHODS:** Patients presenting to a SNH with stage I to IV breast cancer from 2005 to 2017 were identified from the local tumor registry. The hospital has a weekly breast tumor board and a multidisciplinary approach to breast cancer care. Kaplan-Meier survival analysis was performed to identify patient, tumor, and treatment characteristics associated with OS. Factors with a  $p < 0.1$  were included in the Cox proportional hazards model.

**RESULTS:** A total of 2,797 breast cancer patients were evaluated from 2005 to 2017. Patient demographics, tumor characteristics, and treatments received are presented in the Figure. Five-year OS was 80.8% (94.2%, 88.9%, 76.4%, and 30.8% for stages I, II, III, and IV, respectively). Increased stage, higher grade, age older than 70 years, and non-Hispanic ethnicity were associated with worse OS in the Cox model. Patients receiving surgery (hazard ratio 0.56;  $p < 0.0001$ ), chemotherapy (hazard ratio 0.74;  $p = 0.006$ ),

Factor	% population	5-year OS	Factor	% population	5-year OS
<b>Age (years)</b>			<b>Stage</b>		
<40	7.6	82.2	I	29.8	94.2
40-49	22.5	80.6	II	37.1	88.9
50-59	36.7	84.0	III	20.9	76.4
60-69	25.5	82.4	IV	12.2	30.8
70-79	5.6	65.6	<b>Grade</b>		
80+	2.1	50.8	Well	15.0	89.9
<b>Male</b>	1.0	77.8	Moderate	42.0	83.6
<b>Relationship Status</b>			Poor	31.2	76.9
Married	37.5	84.7	Anaplastic	1.4	50.0
Single	35.2	78.0	Unknown	10.0	73.7
Divorced/Separated	24.7	79.6	<b>Receptor Status</b>		
Other	2.6	81.9	ER+	40.6	85.1
<b>Miami Dade resident</b>	95.5	80.7	ER-	14.4	75.4
<b>Smokers</b>	33.5	76.8	Unknown	45.0	79.0
<b>Hispanic</b>	64.9	85.6	PR+	34.3	86.9
<b>Race</b>			PR-	20.7	75.5
White	72.2	84.6	Unknown	45.0	79.0
African American	26.3	71.6	HER+*	11.4	80.3
Other	1.6	72.1	HER-	43.6	83.2
<b>Insurance</b>			Unknown	45.0	79.0
Private	11.2	82.8	<b>Treatments Received</b>		
Medicare	8.0	67.7	Surgery	67.6	89.7
Medicaid	35.9	78.9	Chemotherapy	58.1	82.0
Other	11.4	83.8	Radiation	36.2	87.8
None	33.5	84.8	Hormone therapy	41.8	87.1
<b>Median Income</b>			None	10.0	66.7
Lowest quartile	36.5	78.6			
Upper quartile	13.4	86.0			

\*Her data only available after 2010

**Figure.** SNH Demographics and Disease Characteristics with unadjusted 5 yr OS (n=2797)

and hormone therapy (hazard ratio 0.62;  $p < 0.0001$ ) had better OS compared with those who did not receive these treatments.

**CONCLUSIONS:** Despite serving a minority population that is largely poor, uninsured, and presenting with more advanced disease, OS at our SNH approaches national averages. This novel finding indicates that in the setting of multidisciplinary cancer care and with appropriate receipt and completion of treatment, SNHs can overcome socioeconomic barriers to achieve good outcomes in breast cancer care.

**Passively Collected Smartphone Sensor Data to Detect Postoperative Events after Cancer Surgery: A Prospective, Multicenter, Proof-of-Principle Study**



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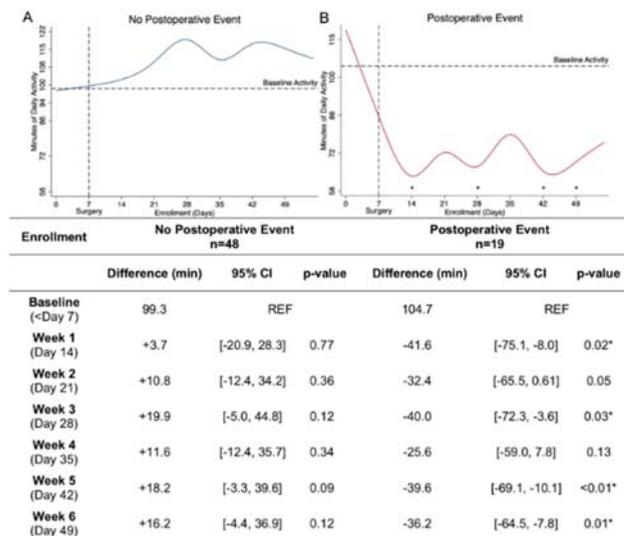
**INTRODUCTION:** Smartphone-based behavioral data have the potential to enable unobtrusive near real-time recovery monitoring. We aimed to determine whether passively collected smartphone accelerometer sensor data can be used to describe differences in postoperative physical activity among patients undergoing cancer operations.

**METHODS:** In a prospective, multicenter study from 2017 to 2019, smartphone owners undergoing cancer operations downloaded an application that passively collected accelerometer data. Nonparametric restricted-cubic-spline-regression was used to fit unadjusted trends in daily activity levels among those with and without a postoperative event (complication, readmission, staged, and/or unplanned reoperation).

**RESULTS:** Sixty-seven patients were followed for a median of 153 days (interquartile range 73 to 182 years). Nineteen (28%) experienced a postoperative event. There were no significant differences in age, sex, American Society of Anesthesiologists class, or location of primary cancer between groups. Compared with mean baseline daily activity (104.7 minutes), patients with a postoperative event had significantly lower daily activity after operation (eg 40 minutes less activity at week 3; 95% CI -72.3 to -3.6;  $p = 0.03$ , Figure). Fewer of these patients were able to achieve at least 60 minutes of daily activity in the 6 weeks after operation compared with patients without a postoperative event (eg week 6: 0.73; 95% CI: 0.68 to 0.79 vs 0.43; 95% CI 0.33 to 0.52;  $p < 0.01$ ).

**CONCLUSIONS:** Smartphone accelerometer sensor data can capture level of postoperative daily activity and detect differences in the trajectory of recovery among patients with a postoperative event. Combining smartphone sensor data with traditional patient-reported outcomes might allow for better assessment of

patient quality of life and early detection of deviation from expected recovery.



**Figure.** Trends in daily exertional activity compared to preoperative baseline among patients (A) without and (B) with a clinically significant postoperative event. Absolute differences from baseline, in minutes, are provided at postoperative weeks 1-6 (enrolment days 14, 21, 28, 35, and 49). CI: confidence interval; min: minutes; \*: denotes statistical significance defined as two-sided p-value<0.05.

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**RESULTS:** Overall, 936,496 patients were identified. When markers of complexity were considered individually, cardiac had the longest median operative time (225 minutes; interquartile range 165 to 292 minutes) and their patients were most complex across 4 individual markers: American Society of Anesthesiologists class  $\geq 4$  (78.5%; 95% CI 77.2% to 79.8%), 30-day mortality (3.39%; 95% CI 2.85% to 4.00%), major complications (56.9%; 95% CI 55.3% to 58.4%), and mean length of stay (9.79 days; 95% CI 9.52 to 10.1 days). Vascular patients were most complex by number of major comorbidities (2.73; 95% CI 2.72 to 2.74) and 30-day readmissions (10.1%; 95% CI 9.82% to 10.3%). Compared with general, cardiac patients were most complex with 40% increased complexity and ENT was least with 60% decreased complexity (Table). Relative value units were very weakly correlated with overall complexity score (Spearman's  $\rho = 0.07$ ;  $p < 0.01$ ).

**Table.** Surgical Specialty Overall Complexity and Primary Work Relative Value Units

Specialty	Overall complexity score	Ratio of complexity score	Median RVU (IQR)
Cardiac	75	1.42	33.8 (33.1–43.3)
Vascular	71	1.34	20.5 (10.2–22.5)
Thoracic	66	1.25	23.5 (14.5–25.8)
Neurologic	57	1.08	23.5 (15.4–27.5)
General	53	1.00 (ref)	11.9 (9.5–20.8)
Orthopaedic	40	0.70	20.7 (12.4–20.7)
Urology	37	0.75	15.3 (8.0–26.8)
Plastic	30	0.57	15.9 (10.4–17.1)
ENT	21	0.40	11.2 (4.4–15.6)

IQR, interquartile range; RVU, relative value unit.

**CONCLUSIONS:** There were substantial differences between patient complexity across surgical specialties, which very weakly correlated with RVUs. This suggests that RVUs are inadequate in capturing surgical complexity.

**Patient Complexity Varies by Surgical Specialty and Does Not Strongly Correlate with Work Relative Value Units**



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**INTRODUCTION:** There are few data on patient complexity variation across surgical specialties. Understanding surgical population differences can inform policy decisions about resource allocation and reimbursement. This study identified variation in patient complexity across surgical specialties and assessed correlation between complexity and relative value units (RVUs).

**METHODS:** The 2017 American College of Surgeons NSQIP was queried for cases involving the specialties of general, neurologic, vascular, urology, orthopaedic, cardiac, thoracic, plastics, and ENT. Ten markers of patient complexity were measured, including American Society of Anesthesiologists class  $\geq 4$ , number of major comorbidities, emergent operation, major complications, concurrent procedures, additional procedures, length of stay, non-home discharge, readmission, and mortality. Specialties were ranked by individual markers of complexity and then summed, creating an overall complexity score and rank that was then compared with general surgery as the referent.

**Quantifying the Contribution of Medical Scribes in an Outpatient Academic Surgical Oncology Setting**



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**INTRODUCTION:** With increasing demands of electronic health records, numerous studies and anecdotal reports have demonstrated improvement in provider morale and patient satisfaction with integration of medical scribes into clinical practice. We sought to quantify changes in work flow attributable to scribes in an outpatient academic surgical oncology setting.

**METHODS:** A retrospective cohort review of outpatient surgical oncology encounters at a single tertiary-care institution from August to September, 2018 and January to February, 2019 was performed. Records from 2 months pre- and post-scribe integration