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1 The Effect of Signed-Out Emergency Department Patients on Resident Productivity

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Objective: Resident productivity is an essential component of operations in an academic emergency department (ED), and transitions in patient care between providers are inevitable. However, while the process of sign-out and its effect on care has been studied, it is unclear what effect the burden of sign-out has on an individual resident's productivity during a shift. We examined the effect of an increasing sign-out burden on resident physicians' productivity. As a secondary measure, we aimed to evaluate this relationship relative to training year.

Methods: This was a retrospective cohort study, conducted in a U.S. urban academic hospital ED, with a three-year emergency medicine training program in which residents pick up patients ad libitum, and receive sign-out from one or more resident colleagues within the first hours of their shift. Consecutive resident shifts were evaluated for new patients seen and patient sign-outs, as timestamps of all patient encounters are automatically logged in an observational database. We constructed a mixed linear model to predict productivity, defined as the number of new patients seen per shift. The main effect was the total number of patients signed out, with level of training as a covariate.

Results: We evaluated 18,296 resident shifts from 7/1/2010 to 7/1/2016. First-year residents saw an average of 10.3 (95% CI 10.0-10.5) patients per shift when they did not take sign-out, and saw 0.13 fewer primary patients (95% CI -0.15 to -0.11) for each additional sign-out patient. The effect of sign-out varied substantially based on level of experience, as second-year residents, who saw a mean of 12.9 (95% CI 12.5-13.2) patients per shift when they did not take sign-out, saw 0.09 fewer patients (95% CI -0.15 to -0.11) for every additional sign-out patient.

Conclusion: Sign-out burden has a small but significant correlation with residents' overall productivity in the ED. As EM residents progress in training, the effect of sign-out burden decreases.

2 Opioid Administration and Prescribing in Older Adults in U.S. Emergency Departments (2002-2013)

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Background: Recent literature suggests that acute pain in older adults is under-treated in the emergency department (ED). Opioids provide effective analgesia but have numerous potential adverse effects, which are magnified in older adults.

Objectives: Our goal was to assess trends in opioid use from 2002-2013 in older adults in U.S. EDs.

Methods: We analyzed data from the National Hospital Ambulatory Medical Care Survey (NHAMCS) survey from 2002 to 2013. ED visits for painful conditions were selected and stratified by age (18-64, 65-74, 75-84, ≥ 85 years). We analyzed trends in opioid administration and prescribing to patients ≥ 65 and assessed predictors of use using survey-weighted chi-square tests and logistic regression. Trends in the use of six commonly prescribed opioids were also explored.

Results: Opioid use for patients 18-64 and ≥ 75 fluctuated between 2002-2013, but overall did not change significantly. There was a significant increase in opioid use for patients 65-74 between the coupled years of 2002-2003 to 2012-2013 (absolute change 5.1%, 95% CI (1.4-8.7), relative change 18.9%). From 2002-2003 to 2012-13, hydromorphone and morphine had the largest increase in utilization to adults ≥ 65 with overall relative increases of 252.2% and 95.2%, respectively. Oxycodone usage had a relative change of -63.4% during the studied 11 years. Opioid utilization peaked in 2010-2011 for all age groups and has since declined. Across all years studied, adults ≥ 65 received less opioids than their younger counterparts for painful conditions.

Conclusion: Adults ≥ 65 who presented to U.S. EDs between 2002-2013 with painful conditions received fewer opioids than younger adults. ED opioid use did not change between 2002 to 2013 for the majority of age groups, except for increases in utilization for patients aged 65-74. There was a trend towards the utilization of more potent opioids. Use of opioids in older adults requires balancing the risks of adverse effects and misuse while avoiding oligoanalgesia.

	2002-03	95% CI	2007-08	95% CI	2012-13	95% CI	Relative Change	Absolute Change	95% CI
18-64	36.9%	(35.3-38.4)	43.4%	(41.2-45.7)	36.7%	(34.6-38.8)	-0.5%	-0.2%	(-2.9-2.6)
65-74	27.0%	(25.0-29.1)	35.1%	(32.5-37.8)	32.1%	(29.2-35.2)	18.9%	5.1%	(1.4-8.7)
75-84	25.4%	(22.7-28.3)	31.0%	(27.9-34.3)	28.1%	(24.4-32.3)	10.6%	2.7%	(-2.0-7.6)
85+	24.8%	(21.5-28.3)	26.2%	(22.5-30.2)	23.8%	(19.5-28.7)	-4.0%	-1.0%	(-6.6-4.6)