

a higher number of unique medications and inappropriate medications or drugs with abuse potential, increasing risk of adverse drug events, financial toxicity, poor adherence, and drug-drug interactions. Adolescent and young adult survivors appear at increased risk of polypharmacy.

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### Post-discharge opioid prescriptions and their association with healthcare utilization in the Vanderbilt Inpatient Cohort Study

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**OBJECTIVES/SPECIFIC AIMS:** Opioid prescribing is common and increasing in certain areas of the country with known risk of misuse and dependence. Our study examined the association of opioid prescription at discharge after hospitalization for acute coronary syndrome (ACS) or acute decompensated heart failure (ADHF) with emergency department (ED) care or all-cause readmission, intended healthcare utilization (follow-up with physician within 30 d of discharge and cardiac rehab participation), and all-cause mortality. **METHODS/STUDY POPULATION:** The Vanderbilt Inpatient Cohort Study is a prospective cohort of hospitalized patients age >18 enrolled with either ACS or ADHF between 2011 and 2015 (index hospitalization). We then excluded those who died during the index hospitalization, patients with hospitalization <24 hours, patients discharged to hospice care, or those who underwent coronary artery bypass surgery because of the high probability of receiving opioids. In addition, we limited the analyses to patients whom we had complete covariate data. The primary predictor variable was an opioid prescription at the time of hospital discharge. We collected healthcare utilization behavior for 90 days after discharge, and mortality data until March 8, 2017. Time-to-event analysis using Cox proportional hazard models was performed for both unintended healthcare utilization behavior and mortality outcomes. Logistic regression was performed for intended healthcare utilization (adherence to follow-up appointments and cardiac rehabilitation). All models were adjusted for demographic data, opioid use prior to index hospitalization, severity of illness, and healthcare utilization prior to the index hospitalization. **RESULTS/ANTICIPATED RESULTS:** There were 501 patients discharged with an opioid prescription and 1994 with no opioid prescription at discharge. Among patients with opioids at discharge 235 (47%) experienced unplanned healthcare events (71 ED visits and 164 readmissions) and among nonopioid patients 775 (39%) experienced unplanned healthcare events (254 ED visits and 521 readmissions) (aHR: 1.06, 95% CI: 0.87, 1.28). Patient mortality in the opioid group was 131 versus 432 in the nonopioid group (aHR: 1.08, 95% CI 0.84, 1.39). Patients in the opioid at discharge group were less likely to attend follow up visits or participate in cardiac rehab (OR: 0.69, 95% CI 0.52, 0.91,  $p=0.009$ ) compared with those not discharged on opioid medications. Sensitivity analysis of patients who were prescribed prehospital opioids (including prehospital opioids in the exposure group with postdischarge opioids) did not reveal a statistically significant increase in mortality (aHR: 1.09, 95% CI 0.91, 1.31) or unintended healthcare utilization (aHR: 1.12, 95% CI 0.89, 1.41) among opioid users. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Morbidity and mortality related to opioid use is a public health concern. Our study demonstrates a statistically significant reduction in physician follow-up and participation in cardiac rehab among opioid users, both of which are known to decrease patient mortality. We did not find a statistically significant increase in unplanned healthcare utilization or mortality. Sensitivity analysis combining prehospital and posthospital opioid prescriptions did not reveal a statistically significant association between opioid use, hospital readmissions, or mortality. The hospital provides unique patient interactions where providers can make significant medical changes based on their patient's clinical status. Continuing to understand the association between opioid use, healthcare utilization, morbidity, and mortality in recently hospitalized cardiac patients will provide data to support reduction in total opioid dose to improve clinical outcomes.

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### Post-traumatic stress symptoms in caregivers of pediatric hydrocephalus population

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**OBJECTIVES/SPECIFIC AIMS:** The goal of this study is to characterize traumatic events and post-traumatic stress symptom severity experienced by caregivers of children with hydrocephalus. Results will eventually be evaluated and compared with demographic and medical characteristics. This study is part of a

larger research project that aims to (1) determine the prevalence and risk factors for post-traumatic stress symptoms in pediatric hydrocephalus patients and their caregivers; (2) develop a targeted intervention to mitigate its effects and pilot test the intervention. **METHODS/STUDY POPULATION:** Caregivers of children with hydrocephalus that have received surgical treatment (CSF shunt or ETV/CPC) were enrolled during routine follow up visit in a pediatric neurosurgery clinic. Caregivers completed the PTSD Checklist for DSM-5 (PCL-5), a 20-item self-report measure that assesses the presence and severity of post-traumatic stress disorder (PTSD) symptoms. **RESULTS/ANTICIPATED RESULTS:** Participant responses ( $n=56$ ) revealed that 57.14% of caregivers indicated that their most traumatic event was directly related to their child's medical condition. In total, 23.21% of caregivers did not specify their most traumatic event and 1.79% of caregivers indicated that they had never experienced a traumatic event. Median Total Symptom Severity Score was 11 (mean: 15.32  $\pm$  14.92), and scores ranged from 0 to 67; 32.14% of caregivers scored 19 or greater, and 16.07% of caregivers scored 33 or greater, a value suggestive of a provisional diagnosis of PTSD. Severity scores by DSM-V clusters were as follows: cluster B—intrusion symptoms (mean: 4.91  $\pm$  4.77, median: 4, range: 0–20), cluster C—avoidance symptoms (mean: 1.27  $\pm$  1.87, median: 0.5, range: 0–8), cluster D—negative alterations in cognition and mood (mean: 4.86  $\pm$  6.07, median: 2, range: 0–22), and cluster E—alterations in arousal and reactivity (mean: 4.29  $\pm$  4.07, median: 3, range: 0–17). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Preliminary results from this study indicate that post-traumatic stress symptoms are prevalent among caregivers of children with hydrocephalus. These results suggest that psychosocial issues such as PTSS may be a significant problem in need of treatment, that is not traditionally addressed as part of routine care for families of children with hydrocephalus. Characterizing post-traumatic stress symptoms in this population sets the foundation for the development of screening and treatment protocols for post-traumatic stress symptoms in caregivers of children with hydrocephalus. This study is the first step towards fundamentally improving routine clinical care and quality of life for patients with hydrocephalus and their caregivers by understanding and addressing the effects of traumatic stress.

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### Prenatal near roadway air pollution exposure and early neurodevelopment in young Mexican-American children: Findings from the CHAMACOS prospective birth cohort study

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**OBJECTIVES/SPECIFIC AIMS:** Previous studies suggest that prenatal exposure to environmental pollutants can have an adverse effect on brain development. We examine the association between prenatal near roadway air pollution (NRAP) exposure and early neurodevelopment. **METHODS/STUDY POPULATION:** The Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS) Study is a prospective birth cohort that began in 1999 with 605 mother-child pairs of primarily Mexican-American descent. Maternal residence during pregnancy was geocoded using ArcGIS and prenatal NRAP exposure was assigned using the CALINE4 line source dispersion model. We used composite Bayley Scale scores for cognitive and motor development, and created separate linear regression models at 6, 12, and 24 months of age. **RESULTS/ANTICIPATED RESULTS:** After adjusting for relevant maternal and child characteristics, preliminary estimates suggest that prenatal NRAP exposure is associated with a nonsignificant increase in Bayley Scale scores at 6 and 24 months (cognitive:  $\beta=0.13$ ,  $p$ -value = 0.20 and motor:  $\beta=0.08$ ,  $p$ -value = 0.58 at 6 months; cognitive:  $\beta=0.16$ ,  $p$ -value = 0.42 and motor:  $\beta=0.20$ ,  $p$ -value = 0.25 at 24 months) and a nonsignificant decrease at 12 months (cognitive:  $\beta=-0.07$ ,  $p$ -value = 0.64 and motor:  $\beta=-0.12$ ,  $p$ -value = 0.56). **DISCUSSION/SIGNIFICANCE OF IMPACT:** Our preliminary findings do not suggest that prenatal NRAP exposure is associated with early cognitive development. Additional exploration of co-exposures known to effect neurodevelopment should be examined in this rural population.

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### Profile of pediatric potentially avoidable transfers

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**OBJECTIVES/SPECIFIC AIMS:** While hospital-hospital transfers of pediatric patients is often necessary, some pediatric transfers are potentially avoidable.