Background: Several decades of animal and basic science research have demonstrated that certain opioids have immunosuppressive properties, but the clinical relevance of opioid-related immunosuppression remains unclear. Although experts have called for epidemiologic research to inform clinical practice, prioritization of that research depends partly on a determination of the number of people potentially affected. To date, population-level estimates of administering or prescribing immunosuppressive opioids (ISOs) have not been measured. Our objective was to estimate the overall frequency of ambulatory visits involving ISOs, and to estimate the frequency of these visits among immunocompromised patients. **Methods:** We used the CDC National Ambulatory Medical Care Survey (NAMCS) and National Hospital Ambulatory Medical Care Survey–Emergency Departments (NHAMCS-ED) data sets (2006–2016) to compute average annual frequencies of patient visits involving ISOs. We accounted for survey sampling design and visit weights using SAS version 9.4 software. We adopted a definition of ISOs from the literature as 'alone or in-combination' formulas of codeine, morphine, and fentanyl. We approximated patients' immunocompromised status by the administering or prescribing of anti-infective drugs, and by chronic conditions indicative of immunocompromised status. We stratified visits with mentions of ISOs by co-occurring clinical-use of anti-infective drugs, and by selected chronic conditions. **Results:** From 2006 to 2016, annual averages of 7.9% (N = 10,383,000; SE, 447,000) of all ED visits and 1.3% (N = 12,674,000; SE, 558,000) of all outpatient office visits involved the administering or prescribing of 1 or more ISO. Over the same period, coprescribing or administering of anti-infective drugs alongside ISOs occurred during 2.1% (N = 2,782,000; SE, 130,000) of all ED visits, and 0.4% (N = 3,525,000; SE, 219,000) of all outpatient office visits. ED visits by patients with selected chronic conditions who were administered or prescribed ISOs include cancer—499,000 (SE, 39,000), diabetes—1,369,000 (SE, 82,000), and HIV—45,000 (SE, 7,000). Outpatient office visits by patients with selected chronic conditions who were administered or prescribed ISOs include cancer—1,032,000 (SE, 92,000), diabetes—1,802,000 (SE, 142,000), and chronic renal failure—138,000 (SE, 22,000). **Conclusions:** More than 10 million ED visits and 12 million outpatient office visits involved the clinical use of ISOs on average, from 2006 to 2016. These averages include visits by immunocompromised patients who could potentially benefit from nonimmunosuppressive analgesic alternatives, when appropriate. Until further research is conducted on the clinical relevance of these opioids' immunosuppressive properties, their use to treat immunocompromised patients may represent unrecognized patterns of inappropriate drug use.

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Presentation Type:
Poster Presentation

NHSN Catheter-Associated Urinary Tract (CAUTI) Definition—Opportunity for Improvement

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Background: Urinary tract infections (UTIs) are one of the most common hospital-acquired infections; ~70%–80% are attributable to an indwelling urethral catheter. Daily risk of bacteriuria acquisition varies from 3% to 7% with a catheter. CAUTIs are associated with increased mortality, cost, and inappropriate treatment of asymptomatic bacteriuria which promotes antimicrobial resistance and *Clostridium difficile* infection. NHSN CAUTI criteria is most commonly met when a patient has a positive urine culture and a fever. Although fever can be associated with many sources, it cannot be excluded from UTI determination even when attributable to another recognized source. Given the high prevalence of bacteriuria in catheterized patients and the many sources of fever, the NHSN definition lacks specificity. **Objective:** To better classify CAUTI using enhanced criteria to so that appropriate reduction efforts would be utilized. **Methods:** A retrospective review was conducted to evaluate NHSN-defined CAUTIs from July 2017 to December 2018. Patients with NHSN defined CAUTI were evaluated to determine elements present to meet criteria. Overcaptured (O-CAUTIs) were defined as follows: (1) O-CAUTI 1, a positive culture with fever attributable to an infectious source; (2) O-CAUTI 2, a positive culture with fever attributable noninfectious source; (3) O-CAUTI 3, repeated

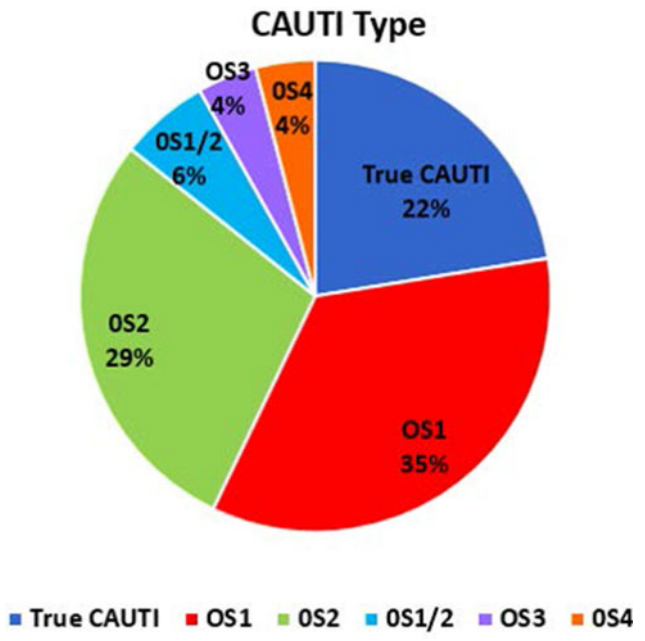


Fig. 1.

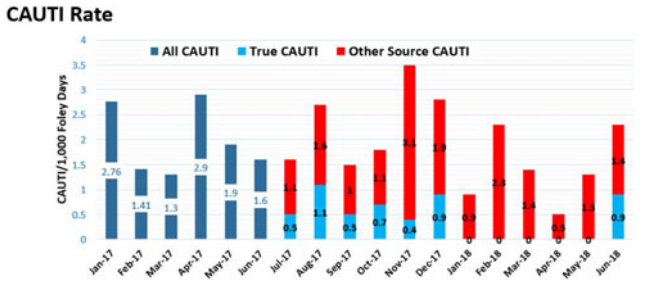
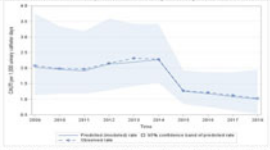


Fig. 2.

Figure-1. Trends in the incidence of catheter-associated urinary tract infections (CAUTI) in intensive care units, acute care hospitals, NHSN, 2009-2018



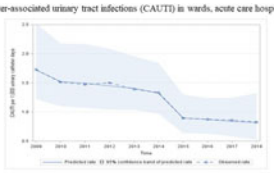
Summary of model coefficients, incidence rate ratios, and annual percent change of incidence of catheter-associated urinary tract infections

Effect of generalized linear mixed model[a]	Estimate	Standard Error	p-value	Incidence rate ratio (95%CI)	Percent change per year[b] (95%CI)
Time trend per year (2009-11) (β_1)	−0.004	0.014	0.7624	0.996 (0.969,1.023)	−0.42 (-3.09, 2.33)
Immediate effect of interruption at 2012 (β_2)	0.076	0.020	0.0002	1.079(1.036,1.123)	7.86 (3.62, 12.27)
Change in slope direction after 2012 (β_3)	0.059	0.015	0.0001	1.060 (1.029,1.092)	6.03 (2.92, 9.23)
Immediate effect of interruption at 2015 (β_4)	−0.493	0.016	<0.0001	0.611 (0.593,0.630)	−38.9 (-40.73, -37.01)
Change in slope direction after 2015 (β_5)	−0.148	0.008	<0.0001	0.863 (0.849,0.877)	−13.72 (-15.11, -12.31)
Time trend per year (2012-14) (β_1, β_3)	0.054	0.007	<0.0001	1.056 (1.042,1.070)	5.58 (4.23, 6.96)
Time trend per year (2015-18) (β_1, β_3 , β_5)	−0.093	0.006	<0.0001	0.911 (0.901,0.921)	−8.9 (-9.89, -7.91)

[a] Generalized linear mixed model adjusted for type of intensive care units and hospital characteristics, ie, facility type, teaching status, hospital bed size, total number of beds in intensive care units, average length of patient stay in a hospital, which were derived from annual hospital survey and may vary by calendar year.
[b] Percent change = (incidence rate ratio-1) x 100

Fig. 1.

Figure-2. Trends in the incidence of catheter-associated urinary tract infections (CAUTI) in wards, acute care hospitals, National Healthcare Safety Network, 2009-2018



Summary of model coefficients, incidence rate ratios, and annual percent change of incidence of catheter-associated urinary tract infections

Effect of generalized linear mixed model[a]	Estimate	Standard Error	p-value	Incidence rate ratio (95%CI)	Percent change per year[b] (95%CI)
Time trend per year (β_1)	−0.043	0.005	<.0001	0.958 (0.949, 0.966)	−4.25 (-5.11, -3.38)
Immediate effect of interruption at 2015 (β_2)	−0.325	0.016	<.0001	0.723 (0.701, 0.745)	−27.72 (-29.9, -25.48)

[a] Generalized linear mixed model adjusted for various types of wards and hospital characteristics, ie, facility type, teaching status, hospital bed size, total number of beds in intensive care units, average length of patient stay in a hospital, which were derived from annual hospital survey and may vary by calendar year. Note there was no significant change in slope direction before and after 2015.
[b] Percent change = (incidence rate ratio-1) x 100

Fig. 2.

positive cultures outside the RI period; (4) O-CAUTI 4, a positive culture with symptoms attributable to another source and no fever. Classifications were discussed with the medical and clinical leadership to determine appropriate opportunities for improvement. **Results:** Overall, 49 NHSN CAUTIs were identified with 11 of 49 (22%) being true CAUTIs and 38 of 49 (78%) O-CAUTI. O-CAUTI 1 was most common, with 17 of 38 (45%). The most frequent attributable source of fever for O-CAUTI 1 (infectious source) was respiratory (7 of 17, 59%) followed by gastrointestinal (6 of 17, 35%). Also, 14 of 38 (37%) were O-CAUTI 2. Central fever was the most frequent source of fever for the noninfectious source (9 of 14, 64%) followed by drug fever (2 of 14, 14%). Of 38 patients, 3 (8%) had both an infectious and noninfectious reason for fever (CAUTI 1 and 2); 4 patients had no fever. Furthermore, 2 were O-CAUTI 3 (repeat culture positive) and 2 were O-CAUTI 4 (1 with hematuria and renal cell carcinoma and 1 with dysuria without leukocytosis). **Conclusions:** NHSN CAUTI definitions capture UTIs and other events. In FY2018, there were no true CAUTIs in 5 of 12 months (42%). Also, 50% of CDC CAUTIs were not UTI but could lead to inappropriate antibiotic use. Reviewing only CAUTI reduction work in O-CAUTIs prevents the assessment of other appropriate opportunities for improvement.

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Poster Presentation

National Trends of Incidence of Catheter-Associated Urinary Tract Infections in Acute-Care Hospitals

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Background: An indwelling urinary catheter is used in ~12%–16% of adult hospital inpatients during their hospitalization, which poses risks for acquiring a catheter-associated urinary tract infection (CAUTI). CAUTI data have been reported to the NHSN since 2005, and national benchmarks are annually reported in NHSN progress reports. Trends analyses in the incidence of CAUTI reported to the NHSN over long time have not been previously assessed. **Objective:** We investigated the national trends of CAUTI incidence separately for intensive care units (ICUs) and wards in acute-care hospitals (ACHs) from 2009 through 2018. **Methods:** We analyzed CAUTI data from ACHs reported to NHSN in 2009–2018. To evaluate trends of CAUTI incidence (per 1,000 catheter days), we conducted interrupted time-series analysis using negative-binomial mixed-effects modeling, separately for ICUs (nonneonatal ICUs) and wards. Due to the reporting requirement for adult and pediatric ICUs in 2012, and medical, surgical, and medical-surgical wards in 2015 by the CMS and the institution of the NHSN CAUTI definitional changes in 2015, calendar years 2012 and 2015 were treated as interruptions to the outcome in ICU models, and year 2015 was treated as a single interruption in the ward models. Regression models were assessed and adjusted, as appropriate, for patient care location type and facility-level characteristics such as hospital type, teaching status, bed size, number (and percentage) of ICU beds, and average length of inpatient stay. Random intercept and slope models were evaluated with covariance tests and were included to account for differential baseline incidence and trends among reporting hospitals. **Results:** The volume of patient care locations and hospitals reporting to the NHSN increased over time. Among the ICUs, the CAUTI incidence rate did not change in 2009–2012 and increased at an average of 5.6% per year in 2012–2014 (Fig. 1). CAUTI incidence rate dropped nearly 40% in 2015; thereafter, it decreased at an average of 8.9% per year. Among the wards, CAUTI incidence rate decreased at an average of 4.3% per year beginning 2009 (Fig. 2). The CAUTI incidence rate dropped almost 28% in 2015 and then decreased at an average of 4.3% per year. **Conclusions:** CAUTI incidence decreased substantially in 2015 among both ICUs and wards, which was partially attributable to CAUTI definitional change (see also Fig. 7 at https://www.cdc.gov/hai/data/archive/data-summary-assessing-progress.html). The significant decline of CAUTI incidence in both location types since 2015 is encouraging, and continued efforts in prevention of CAUTI are vital to sustaining this decline in the future.

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