Table 1.

Table. Association Between Hospital Characteristics and Number of Times Penalized by the HACRP

	Logit Model Point Estimates	OR (95% CI)	*P* value
Teaching Status Y vs N	0.1502	1.16 (0.99-1.37)	0.0756
IP per 1,000 beds	-0.0106	0.99 (0.98-1.00)	0.0085
Surveillance hours per week per bed	0.308	1.36 (0.85-2.17)	0.197
other infection control activities per week per bed	0.224	1.25 (0.87-1.77)	0.2029
Nurse/bed ratio	-0.0577	0.94 (0.89-1.00)	0.0532
housekeeping expenditure per 10,000 beds	0.2837	1.33 (1.21-1.46)	<.0001
nursing vacancies per bed	0.1339	1.14 (0.85-1.54)	0.3818
Bed-size 0-99 vs ≥400	-0.8198	0.44 (0.32-0.6)	<.0001
Bed-size 100-199 vs ≥400	-0.6979	0.50 (0.38-0.64)	<.0001
Bed-size 200-299 vs ≥400	-0.4041	0.67 (0.51-0.87)	0.0027
Bed-size 300-399 vs ≥400	-0.2385	0.79 (0.59-1.06)	0.1094
EHR Y vs N	-0.166	0.85 (0.72-1)	0.0502
# skilled nursing beds	0.00284	1.003 (1.003-1.005)	0.0055
Urban vs Rural	0.0925	1.10 (0.90-1.33)	0.3521
cmi_quartile 0 vs 3	-0.286	0.75 (0.58-0.97)	0.0268
cmi_quartile 1 vs 3	-0.2617	0.77 (0.62-0.96)	0.019
cmi_quartile 2 vs 3	-0.1295	0.88 (0.72-1.07)	0.2017

record (EHR) implementation, number of skilled nursing beds, rural or urban location, and Medicare patient case-mix (cmi_quartiles). **Results:** In our model, negative logit model point estimates indicated that increased values of the variable are associated with a lower odds of having a higher number of penalties. The final data set consisted of 3,004 US hospitals. Lower penalties were significantly associated with higher IP-to-bed ratio. Although the point estimates were <1, an association between lower penalties and higher nurse-to-bed ratios or electronic health records was not demonstrated (Table 1). **Conclusions:** Our results suggest that after controlling for selected hospital structural factors, incremental resources related to infection control have a protective association with HCARP penalties.

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Association of Receipt of Antibiotics with Patient Satisfaction for Caregivers of Children Presenting to Urgent-Care Settings

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Background: The Press Ganey (PG) Medical Practice Survey is a commonly used questionnaire for measuring patient experience in healthcare. Our objective was to evaluate the PG surveys completed by caregivers of children presenting for urgent care evaluation of acute respiratory infections (ARIs) to determine any correlation with receipt of antibiotics during their visit. **Methods:** We evaluated responses to the PG urgent-care surveys for encounters of children <18 years presenting with ARIs (ie, sinusitis, bronchitis, pharyngitis, upper respiratory infection, acute otitis media, or serous otitis media with effusion) within 9 University of Utah urgent-care centers. Scores could range from 0 to 100. Because the distributions of scores followed right- skewed distribution with a high ceiling effect, we defined scores as dissatisfied with their care (≤25th percentile) and satisfied with their care (scores >25th percentile). Univariate and multivariable generalized mixed-effects logistic regression was used to assess correlates of patient dissatisfaction. Random intercepts were included for each provider to account for correlation within the same provider. Separate models were used for each PG component score. Multivariable models adjusted for receipt of antibiotics, age, gender, race, ethnicity, and provider type. **Results:** Overall, 388 of 520 responses (74.6%) indicated satisfaction and 132 responses (25.4%) indicated dissatisfaction. Among patients who did not receive antibiotics, 87 of 284 responses (30.6%) indicated dissatisfaction versus 45 of 236 (19.1%) who did receive antibiotics. Among patients who were dissatisfied with their clinician, raw clinician PG scores were higher among patients who received antibiotics (mean, 64.5; standard deviation [SD], 16.9) versus those who did not receive antibiotics (mean, 54.7; SD, 24.4; $P = .015$) (Table 1). In a multivariable analysis, receipt of antibiotics was associated with a reduction in patient dissatisfaction overall (odds ratio, 0.55; 95% CI, 0.36–0.85). **Conclusions:** Overall, most responses for patients seen for ARIs in pediatric urgent care were satisfied. However, a significantly higher proportion of responses for patients who did not receive

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Table 1.

Raw PG scores by receipt of antibiotics, P Values assessed by t-tests (Table).

	Dissatisfied (Score <= 25th percentile)			Satisfied (Score > 25th percentile)		
Raw PG Score	No Antibiotics	Antibiotics	P	No Antibiotics	Antibiotics	P
Overall Visit Mean (SD)	64.3 (14.9)	66.7 (11.0)	0.346	95.9 (5.5)	96.5 (5.1)	0.254
Clinician, Mean (SD)	54.7 (24.4)	64.5 (16.9)	0.015	98.3 (4.8)	99.1 (3.3)	0.046

antibiotics were dissatisfied than for those patients who received antibiotics. Antibiotic stewardship strategies to communicate appropriate prescribing while preserving patient satisfaction are needed in pediatric urgent-care settings.

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Automated Prediction of Surgical Site Infection Coronary Artery Bypass (CABG) Grafting Surgery

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Background: In 5 hospitals located in Belo Horizonte city (>3,000,000 inhabitants) a focused survey on surgical site infection (SSI) was performed in patients undergoing CABG surgery. We statistically evaluated such incidences to enable study of the prediction power of SSI through pattern recognition algorithms, in this case the multilayer perceptron (MLP) artificial neural networks. **Methods:** Data were collected between July 2016 and June 2018 on SSI by the hospital infection control committees (CCIHs) of the hospitals involved in the research. We collected all data used in the analysis during their routine SSI surveillance procedures. The information was forwarded to the NOIS (Nosocomial Infection Study) Project, which uses the SACIH (Automated Hospital Infection Control System) software to collect data from a sample of hospitals participating voluntarily in the project. After data collection, 3 procedures were performed: (1) a treatment of the collected database for use of intact samples; (2) a statistical analysis on the profile of the hospitals collected; and (3) an assessment of the predictive power of 5 types of MLP (ie, backpropagation standard, momentum, resilient propagation, weight decay, and quick propagation) for SSI prediction. MLPs were tested with 3, 5, 7, and 10 hidden layer neurons and a database split for the resampling process (65% or 75% for testing and 35% or 25% for validation). They were compared by measuring the AUC (area under the curve; range, 0–1) presented for each of the configurations. **Results:** From 666 initial data, only 278 were able for analysis. We obtained the following statistics: 9.35% manifested SSIs; length of stay varied from 1 to 119 days, with ~40% staying between 10 and 19 days; 15.1% of the patients died. Regarding the prediction power of SSI, the experiments have a maximum value of 0.713. **Conclusions:** Despite the considerable loss rate of >50% of the database samples due to the presence of noise, it was possible to have a relevant sampling to evaluate the profile of hospitals in Belo Horizonte. In addition, for the predictive process, although some configurations had results equal to 0.5, others reached 0.713, which indicates that the automated SSI monitoring framework for patients undergoing coronary artery bypass grafting surgery is promising. To optimize data collection and to enable other hospitals to use the SSI prediction tool (available at www.sacihweb.com), a mobile application was developed.

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Automated Risk Analysis of Surgical Site Infection in Hip Arthroplasty Surgeries

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Background: In 7 hospitals in Belo Horizonte, a city with >3,000,000 inhabitants, a survey was conducted between July 2016 and June 2018, focused on surgical site infection (SSI) in patients undergoing arthroplasty surgery procedures. The main objective is to statistically evaluate such incidences and enable a study of the prediction power of SSI through pattern recognition algorithms, the MLPs (multilayer perceptron). **Methods:** Data were collected on SSI by the hospital infection control committees (CCIHs) of the hospitals involved in the research. All data used in the analysis during their routine SSI surveillance procedures were collected. The information was forwarded to the NOIS (Nosocomial Infection Study) Project, which used SACIH automated hospital infection control system software to collect data from a sample of hospitals participating voluntarily in the project. After data collection, 3 procedures were performed: (1) a treatment of the database collected for the use of intact samples; (2) a statistical analysis on the