Poster Tour Guide Packet

ISPOR 2022

Poster Session:	**In-Person and Virtual Poster Session 3**
Tour Name:	**Infectious Disease (non-vaccine)**
Tour Time:	Tuesday, May 17, 2022, 12:15 - 1:15 PM
Tour Area:	Area B, Prince George Exhibit Hall

Acceptance Code:	CO75
Abstract Title:	Predictors of Value-Based Outcomes in Sepsis: An Analysis Using Electronic Health Record and Administrative Claims Data
Presenting Author:	Harrison Yoon

Abstract Body:

OBJECTIVES: Sepsis is a severe response to an infection that often requires hospitalization. Admissions for sepsis are costly, estimated to be $27 billion annually. There have been recent shifts towards building sepsis-focused economic models for hospitals. The objective of this study is to identify predictors associated with high-cost hospital admissions and worse outcomes due to sepsis.

METHODS: This is a retrospective cohort study of patients admitted to Barnes-Jewish Hospital with a diagnosis of sepsis or septic shock from 2014 to 2017. Each admission was given a discharge disposition score (DDS) ranging from 1 (worst outcome: death during admission) to 6 (best outcome: discharged to home). To create a charge-outcome value, the total charges per day of each admission was divided by the DDS. The best value-outcome was defined as $0 to $2,500 per DDS and poor value-outcome was defined as greater than $10,000 per DDS. Binary logistic regression was used to identify variables associated with the poor value-outcome category. All charges were adjusted to 2021 dollars.

RESULTS: 3,321 patients (mean age 60.7, SD 15.7) were included in the analysis. The median total charges for all admissions were $114,429.68 (IQR $270,119.09) and the median hospital length of stay was 11.7 days (IQR 18.2). The presence of cancer (OR 1.58; 95% CI 1.35-1.84), chronic kidney disease (OR 1.42; 95% CI 1.20-1.68), heart failure (OR 1.24; 95% CI 1.05-1.45), and at least one antibiotic-resistant pathogen (OR 2.77; 95% CI 2.27-3.38) were associated with an increased risk of having poor value-outcomes.

CONCLUSIONS: In patients with sepsis, the presence of common chronic diseases, antibiotic resistant pathogens, and malignancy were associated with incurring higher hospital charges with worse outcomes compared to those without. Future steps include identifying specific hospital resources incurred in those with high-cost sepsis admissions.

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Acceptance Code:	EPH120
Abstract Title:	Comparing the Effectiveness and Cost-Effectiveness of SARS-COV-2 Screening Strategies Using Rapid Antigen Tests in a Residential College Campus
Presenting Author:	Harry Smolen

Abstract Body:

OBJECTIVE: To compare the effectiveness and cost-effectiveness of SARS-CoV-2 screening strategies using rapid antigen tests in a residential college campus.

METHODS: A compartmental epidemic model was developed from published sources, primarily from Paltiel et al. JAMA Network Open 2020. In model development we identified several needed corrections to the published model which were confirmed with the lead published author. Our model was verified against all published numeric outcomes of Paltiel (2020). Our modeling study included a hypothetical cohort of 5000 students – 4990 students without SARS-CoV-2 infection and ten with undetected, asymptomatic SARS-CoV-2 infection. The screening strategies that we evaluated were symptom-based screening and tests of varying frequency (i.e., every 1, 2, 3, and 7 days) and sensitivity (i.e., 40, 50, and 60%). These three levels of sensitivity were based on published values for rapid antigen tests, e.g., 35.8% for asymptomatic persons and 64.2% for symptomatic persons (Prince-Guerra et al. MMWR Morb Mortal Wkly Rep. 2021). Specificity was set to 98%, the test cost to $10, and reproductive number (Rt) to 2.5. Model projections were for an 80-day, abbreviated semester.

RESULTS: Within each sensitivity level (i.e., 40, 50, and 60%), screening frequency order of every 7, 3, 2, and 1 days was associated with increasing costs (range $682,000-$4,639,200) and increasing infections averted (range 1202-4797). In terms of cost-effectiveness, for sensitivity levels 40 and 50%, the 7-day screening intervals were dominated. For each sensitivity level, the incremental cost-effectiveness ratio (ICER, $ per infection averted) increased with increased testing frequency. In general, as the test sensitivity increased, ICERs increased, i.e., at higher sensitivities the cost to avert an infection increases as the test frequency increases.

CONCLUSION: From an effectiveness standpoint, more frequent testing is preferable. From a cost-effectiveness standpoint, even for poorly sensitive tests, screening every three days is an attractive option.

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Acceptance Code:	EE238
Abstract Title:	Healthcare Costs of COVID-19 Versus Flu and Pneumonia - a Payer Perspective
Presenting Author:	Fayolah Richards

Abstract Body:

OBJECTIVES: Payer costs associated with the acute coronavirus 2019 disease (COVID-19) are not well documented. Our study evaluates payer costs of COVID-19 patients compared to those from patients with influenza and viral pneumonia.

METHODS: Patients with COVID-19 from October 1st, 2020, to February 1st, 2021, or with flu or pneumonia, from October 1st, 2018, to February 1st, 2019, and ≥ 6 months of continuous enrollment pre-and post-index, in IBM® MarketScan® Commercial Claims and Encounters and Medicare Supplemental databases, were identified. COVID-19 patients were further stratified based on severity of disease using the mild, moderate and severe disease signs and symptoms as defined by the Janssen ENSEMBLE Trial. Variables for all patients included demographics and comorbidities. Duration of disease for COVID-19 patients was defined as: 5 days before positive test to last related visit/prescription; for influenza: from first diagnosis to last related visit/prescription. A maximum 35-day gap was allowed between visits/prescriptions. Outcomes were all-cause and disease-specific costs for the entire duration of the disease. Influenza/pneumonia and COVID cohorts were matched (R package MatchIt –distance: "GLM" –method "nearest"), and 2021 inflation-adjusted costs were estimated using generalized linear model with gamma distribution and log link.

RESULTS: 6,176 Medicare [58.8% female, average age 75.1 (standard deviation (SD): 7.5) and 15,638 Commercially-insured patients [57% female, average age 33.5 (SD: 16.7)] were included, half COVID-19 and half influenza/pneumonia patients. All-cause and disease-specific costs for severe COVID-19 were statistically significantly greater than those for flu/pneumonia, for commercial and Medicare payers (Difference in costs: Commercial: all-cause: $34,564 (95% CI: $16,211-$52,916); disease-specific: $19,458 (95%CI: $9,989-$28,929); Medicare: all-cause: $33,727 (95%CI: $25,917-$41,538) disease-specific: $10,846 (95%CI: $8,114-$13,578)). Costs for moderate COVID-19 were significantly higher than influenza/pneumonia for commercial payers but not Medicare.

CONCLUSION: The cost of care for severe COVID-19 significantly exceeded those for influenza/pneumonia in patients matched on age and comorbidities.

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Acceptance Code:	EE260
Abstract Title:	Early Albumin Infusion May Reduce Intensive Care Unit (ICU) Cost in Cirrhotic Patients with Spontaneous Bacterial Peritonitis (SBP): A Cross-Sectional Study
Presenting Author:	M. Chris Runken

Abstract Body:

OBJECTIVES: SBP is a serious and costly cirrhosis complication, with ~50% of cases requiring ICU admission. Due to its demonstrated efficacy in critical care settings, albumin is recommended by the American Association for the Study of Liver Diseases as an adjuvant to antibiotics for the management of SBP. We examined the relationship between early albumin infusion and ICU cost in a subgroup of cirrhotic patients who developed SBP during hospitalization.

METHODS: Premier Healthcare Database was queried for inpatient data corresponding to adult cirrhotic patients who developed SBP, received antibiotics, and experienced an ICU admission/transfer, between Jan-2016 and Jun-2019. Patients were selected based on ICD-10 and billing codes. The 'early albumin' group included patients who received albumin within 1 day of hospitalization, while the 'non-early' group received albumin after day 1 of hospitalization or not at all. Propensity score matching (PSM) (1:1) was used to balance both cohorts by sociodemographic characteristics, baseline Elixhauser Comorbidity Index, and presence of hepatorenal syndrome, end-stage renal disease, and ascites. Generalized linear models were employed to determine the association between early albumin and ICU costs, controlling for common comorbidities (e.g., hepatic encephalopathy).

RESULTS: PSM yielded 4,106 patients of whom 2,632 survived to discharge. The risk-adjusted ICU cost ratio (CR) was 11% lower among all patients who received early albumin compared to the non-early group (CR: 0.89, 95% CI: 0.84-0.93, $p<0.001$). In the survivor cohort, the risk-adjusted ICU CR was 18% lower in the early group relative to the non-early group (CR: 0.82, 95% CI: 0.77-0.88, $p<0.001$).

CONCLUSIONS: Early albumin infusion was associated with a significant ICU cost reduction in both the overall and survivor-only cohorts. These findings suggest that the co-administration of albumin with antibiotics may alleviate the growing ICU cost burden of SBP as a complication of cirrhosis.

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Acceptance Code:	EE211
Abstract Title:	Cost of Long COVID Following Severe Disease - a US Healthcare Database Analysis
Presenting Author:	Jill Ruppenkamp

Abstract Body:

OBJECTIVES: Continued morbidity following Coronavirus disease 2019 (COVID-19), or long COVID (LC), is defined by the World Health Organization (WHO) as conditions lasting > 2 months and identified 3 months after COVID-19 onset. LC might be particularly prevalent in severe COVID-19 patients. The impact of LC on healthcare costs is unknown.

METHODS: Patients with severe/critical COVID-19 (first date =index) from April 1, 2020, onwards, with ≥ 6 months of continuous enrollment pre- and post-index, in IBM® MarketScan® Commercial and Medicare Supplemental databases, were identified. Severe disease was defined as admissions with respiratory distress/failure, with or without organ/neurological dysfunction or shock/tachypnea/tachycardia/hypoxemia. Variables for all patients included demographics, comorbidities (Elixhauser index (EI) and all 31 Elixhauser disease domains), and COVID-19 signs/symptoms. Disease duration was defined as follows: from 5 days before positive test to last related visit/prescription. A ≤ 35-day gap between visits/prescription was allowed. LC was defined as disease duration ≥ 5 months. All-cause (with any diagnostic code) and disease-specific costs (with COVID-19 related diagnostic codes) for patients with and without LC (non-LC) were estimated from index to end of disease duration or last available date (for ongoing disease), using generalized linear model with gamma distribution and log link.

RESULTS: 13.7% (95%CI: 13.5%-13.9%) with severe/critical COVID-19 had LC. Average available duration of LC for costing analyses was 213.1 days (95%CI: 207.8-218.3). In contrast, non-LC duration of disease averaged 53.6 days (95%CI: 53.1-54.2) Between LC and non-LC patients, all-cause costs significantly increased in commercially-insured and Medicare patients by respectively $58,445 (95%CI: $49,453-$67,437 – from $46,912 (non-LC) to $105,357 (LC)) and $34,940 (95%CI: $28,990-$40,889 – from $29,491 (non-LC) to 64,412 (LC)).

CONCLUSION: As observed over 213 days, all-cause cost of COVID-19 almost doubled in severe COVID-19 patients with LC vs without LC. These costs are expected to further increase with increased follow-up time.

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Acceptance Code:	EPH98
Abstract Title:	A Systematic Review and Meta-Analysis for Risk Factor Profiles in Patients with Resistant Acinetobacter Baumannii Infection Relative to Control Patients
Presenting Author:	Prity Rani Deshwal

Abstract Body:

pathogens, is a major cause of nosocomial infections and high mortality rates. Evaluation of risk factors for such resistant infections will aid surveillance, diagnostic initiatives and can be crucial in early and appropriate antibiotic therapy.

OBJECTIVES: This study aimed to identify the risk factors in patients with resistant A. baumannii infection wrt controls.

METHODS: Prospective or retrospective cohort and case-control studies reporting the risk factors for resistant A. baumannii infection were collected through data sources, MEDLINE/PubMed, OVID/Embase and Web of Science. Studies published in the English language were included while animal studies were excluded. The Newcastle-Ottawa Scale was used to assess the quality of studies. Odds ratio of developing antibiotic resistance in patients with A. baumannii infection was pooled using a random effect model.

RESULTS: The results are based on 38 studies with 60878 participants (6394 cases and 54484 controls). A total of 28, 14, 25 and 11 risk factors were identified for multi-drug, extensive-drug (XDR) and carbapenem resistant-A. baumannii infections respectively.
In multidrug resistant-A. baumannii infection group, exposure of carbapenem [OR 5.51], tracheostomy [OR 5.01] and urinary catheter [OR 4.57] were identified with maximal pool odd's ratio. While previous use of amikacin [OR 4.94], carbapenem [OR 4.91] and pneumonia [OR 4.71] were foremost factors associated with developing carbapenem resistance in A. baumannii infection.
Further analysis revealed, mechanical ventilation [OR 7.21], ICU stay [OR 5.88] and bedridden [OR 4.18] as the most significant factors for XDR-A. baumannii infections.

CONCLUSION: The exposure of carbapenem, amikacin (previous) and mechanical ventilation were the most significant risk factors for multidrug, extensive-drug and carbapenem resistance in patients with A. baumannii infection respectively. These findings provide guidance to control and prevent resistant infections by identifying the patients at higher risk of developing resistance.