

unsuitable because of age. **Conclusion:** With 1 in 7 patients potentially representing suitable candidates for ECMO, this is a technique that warrants consideration for implementation in the EDs of Saskatchewan.

Keywords: resuscitation, extracorporeal membrane oxygenation, cardiac arrest

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Relapse in patients managed in the emergency department for acute asthma: a systematic review

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Introduction: Despite the provision of evidence-based care, approximately 15% of patients discharged from the emergency department (ED) after being treated for asthma exacerbations will relapse within two weeks. This study summarizes the evidence regarding relapses and factors associated with increased relapse in patients discharged from EDs after being treated for asthma exacerbations.

Methods: Comprehensive literature searches were conducted in seven electronic databases; manual and grey literature searches were performed. Studies tracking outcomes for adults after ED management and discharge were included. Methodological quality was assessed using the Newcastle-Ottawa Scale (NOS) and the Risk of Bias (RoB) tools. Studies were summarized using medians and interquartile ranges (IQR) or mean and standard deviation (\pm SD), as appropriate. **Results:** From 793 potentially relevant citations, 178 articles underwent full text review and 10 studies involving 32,923 patients were included. The majority of the studies were of high quality according to NOS and RoB tools. Relapse proportions were $8 \pm 3\%$, $12 \pm 4\%$, and $14 \pm 6\%$ at one, two, and four weeks, respectively. Female sex was the most common statistically significant reported factor associated with an increased risk of relapse within 4 weeks of ED discharge for acute asthma. Other factors significantly associated with relapse were past healthcare utilization and symptom duration. **Conclusion:** After ED management and discharge of acute asthma, a considerable proportion of patients will relapse within the first four weeks. Factors such as female sex, past healthcare utilization, and symptom duration were commonly and significantly associated with relapse occurrence. Identifying patients with these features could provide guidance to clinicians during the ED-discharge decision-making.

Keywords: asthma, relapses, knowledge synthesis

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Presentations for hypoglycemia associated with diabetes mellitus to emergency departments in a Canadian province: a database and epidemiological analysis

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Introduction: Diabetes mellitus (DM) is a major chronic disease. Prevalence of diabetes was 9% globally in 2014 and 9.3% in Canada and 7.2% in Alberta in 2015. Complications of the disease are numerous and frequent. Hypoglycemia is one complication of diabetes treatment. The objective of this study was to quantify and characterize presentations by adults to Alberta emergency departments (EDs) for hypoglycemia associated with type 1 (T1DM) or type 2 (T2DM) diabetes. **Methods:** A retrospective cohort study was conducted using data for Alberta for a five-year period (fiscal years 2010/11-2014/15). Data were sourced from an administrative database: National Ambulatory Care Reporting System (NACRS). Records of interest were those with an ICD-10-CA

diagnosis of DM-associated hypoglycemia (i.e., E10.63, E11.63, E13.63, or E14.63). A descriptive analysis was conducted. **Results:** Data extraction yielded 7,835 presentations by 5,884 patients. The majority of presentations were by males (56.2%) and median patient age was 62. These episodes constituted 0.08% of presentations to Alberta EDs and they occurred at an event rate of 0.67 episodes per 100 patient-years (95% CI: 0.66-0.69). The annual rate of presentations decreased by 11.8% during the five-year period. Most presentations (63.4%) involved transportation to the ED via ambulance. Relative to LOS for ED presentations for all reasons, average length-of-stay (LOS) was 3.2x longer and 1.4x longer for discharged and admitted patients, respectively. For 27.5% of presentations, an X-ray was obtained. Most hypoglycemic episodes (65.2%) were considered to be of moderate severity while 34.3% were considered to be severe. None were mild because all involved access to an ED. The condition mainly (absolute terms) afflicted people with T2DM and urban areas; however, it disproportionately afflicted people with T1DM and rural areas. **Conclusion:** For a condition that is largely preventable with effective blood glucose management, DM-associated hypoglycemia incurs significant healthcare resource use. People with DM would be better served with more effective and safer euglycemic agents.

Keywords: diabetes, hypoglycemia, epidemiology

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Cost of hypoglycemia associated with diabetes mellitus: a systematic review of the literature

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Introduction: Diabetes mellitus (DM) is a major chronic disease. Many patients with DM suffer hypoglycemic episodes that may be mild, moderate or severe, requiring ambulance and emergency department (ED) services. The cost of these DM-associated hypoglycemic episodes in the ED is not well understood. This study identified literature on DM-associated hypoglycemia costs that were incurred in acute care settings, with particular interest in the ED setting. **Methods:** The methods of this systematic review were based on an *a priori* protocol. The literature searches involved 12 databases. Study selection and quality assessment were conducted independently by two reviewers. Costs from included studies were standardized to year 2014 Canadian dollars. Mean with standard deviation (SD) and median costs with interquartile range (IQR) were calculated whenever possible. **Results:** The systematic search yielded 1,164 studies and 62 were included. The largest proportion of studies (45%) originated from USA data. Quality of included studies varied widely. Although none of the studies were purely a cost analysis of DM-associated hypoglycemia in the ED, 15 studies reported some ED costs. Median DM-associated hypoglycemic episode costs were \$1,187.15 in the ED and \$1,288.92 irrespective of setting. More severe episodes were more costly; costs were 8.5 times higher in the inpatient setting than in the ED. Episode costs were 18-45% higher for patients with Type 2 DM than Type 1. Direct costs comprised 80% of total costs. **Conclusion:** Acute episodes of DM-associated hypoglycemia are costly. These episodes also often require hospitalization; the highest costs are incurred by admitted patients with Type 2 DM. More studies are needed to better understand the costs associated with ED use by patients with DM-associated hypoglycemia.

Keywords: diabetes, hypoglycemia, cost