

Data Supplement

Title: Comparative causal analysis of long-acting muscarinic antagonist versus no long-acting bronchodilator use on readmission or mortality after hospitalization for chronic obstructive pulmonary disease

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Factors related to the Index hospitalization. These were based on Condition Categories (CCs) that are part of CMS' Hierarchical Condition Categories (groupings of ICD-9 codes). However, while CMS adjusts for these factors based on the 12 months prior to the event, in this analysis, they were based on the index hospitalization. In addition to length of stay, factors used by CMS to risk adjust for readmission following a discharge for an inpatient stay due to COPD were mechanical ventilation and sleep apnea (identified based on procedure codes and ICD-9 codes) and the CC identified factors of:

- a. Cardiovascular/Respiratory Factors:
 - i. Respirator Dependence/Respiratory Failure (CC 77-78)
 - ii. Cardio-Respiratory Failure and Shock (CC 79)
 - iii. Congestive Heart Failure (CC 80)
 - iv. Acute Coronary Syndrome (CC 81-82)
 - v. Chronic Atherosclerosis (CC 83-84)
 - vi. Arrhythmias (CC 92-93)
 - vii. Other and Unspecified Heart Disease (CC 94)
 - viii. Fibrosis of Lung and Other Chronic Lung Disorder (CC 109)
 - ix. Vascular or Circulatory Disease (CC 104-106)
 - x. Pneumonia (CC 111-113)
- b. Comorbidities
 - i. Infection (CC 1, 3-6)
 - ii. Metastatic Cancer and Acute Leukemia (CC 7)
 - iii. Lung, Upper Digestive Tract, and Other Severe Cancers (CC 8)
 - iv. Lymphatic, Head and Neck, Brain, and Other Major Cancers; Breast, Colorectal and other Cancers and Tumors; Other Respiratory and Heart Neoplasms (CC 9-11)
 - v. Other Digestive and Urinary Neoplasms (CC 12)
 - vi. Diabetes and DM Complications (CC 15-20, 119-120)
 - vii. Protein-Calorie Malnutrition (CC 21)

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- viii. Disorders of Fluid/Electrolyte/Acid-Base (CC 22-23)
 - ix. Other Endocrine/Metabolic/Nutritional Disorders (CC 24)
 - x. Pancreatic Disease (CC 32)
 - xi. Peptic Ulcer, Hemorrhage, Other Specified Gastrointestinal Disorders (CC 34)
 - xii. Other Gastrointestinal Disorders (CC 36)
 - xiii. Severe Hematological Disorders (CC 44)
 - xiv. Iron Deficiency and Other/Unspecified Anemia and Blood Disease (CC 47)
 - xv. Dementia or Senility (CC 49-50)
 - xvi. Drug/Alcohol Induced Dependence/Psychosis (CC 51-52)
 - xvii. Major Psychiatric Disorders (CC 54-56)
 - xviii. Depression (CC 58)
 - xix. Anxiety Disorders (CC 59)
 - xx. Other Psychiatric Disorders (CC 60)
 - xxi. Quadriplegia, Paraplegia, Paralysis, Functional Disability (CC 67-69, 100-102, 177-178)
 - xxii. Polyneuropathy (CC 71)
 - xxiii. Hypertensive Heart and Renal Disease or Encephalopathy (CC 89)
 - xxiv. Stroke (CC 95-96)
 - xxv. Renal Failure (CC 131)
 - xxvi. Decubitus Ulcer or Chronic Skin Ulcer (CC 148-149)
 - xxvii. Cellulitis, Local Skin Infection (CC 152)
 - xxviii. Vertebral Fractures (CC 157)
- c. Not used by CMS, but identified as being conditions that may represent adverse outcomes of care received during admission – any incidence of one of these was flagged under the binary variable “Major index hospitalization status”:
- i. Septicemia/Shock (CC 2)
 - ii. Acute Liver Failure/Disease (CC 28)
 - iii. Intestinal Obstruction/Perforation (CC 31)
 - iv. Coagulation Defects and Other Specified Hematological Disorders (CC 46)
 - v. Delirium and Encephalopathy (CC 48)
 - vi. Coma, Brain Compression/Anoxic Damage (CC 75)
 - vii. Precerebral Arterial Occlusion and Transient Cerebral Ischemia (CC 97)
 - viii. Pleural Effusion/Pneumothorax (CC 114)

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- ix. Dialysis Status (CC 130)
- x. Nephritis (CC 132)
- xi. Urinary Obstruction and Retention (CC 133)
- xii. Urinary Tract Infection (CC 135)
- xiii. Severe Head Injury (CC 154)
- xiv. Major Head Injury (CC 155)
- xv. Concussion or Unspecified Head Injury (CC 156)
- xvi. Hip Fracture/Dislocation (CC 158)
- xvii. Major Fracture, Except of Skull, Vertebrae, or Hip (CC 159)
- xviii. Poisonings and Allergic Reactions (CC 163)
- xix. Major Complications of Medical Care and Trauma (CC 164)
- xx. Other Complications of Medical Care (CC 165)
- xxi. Major Organ Transplant Status (CC 174)
- xxii. Other Organ Transplant/Replacement (CC 175)