**Peripheral arterial disease prevalence among sepsis hospitalizations and associated outcomes**

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1. **Background**

Sepsis is a common infectious process associated with a dysregulated host response and life-threatening organ dysfunction.[1](https://sciwheel.com/work/citation?ids=13998203&pre=&suf=&sa=0) More than 1.7 million Americans are hospitalized with sepsis annually with one in five patients not surviving to discharge.[2](https://sciwheel.com/work/citation?ids=8159841&pre=&suf=&sa=0)

Like sepsis, atherosclerotic cardiovascular diseases (ASCVD) are common, affecting 19.9 million Americans and remain the leading cause of death in the United States.[3](https://sciwheel.com/work/citation?ids=16580712&pre=&suf=&sa=0) ASCVD, which include peripheral artery disease (PAD) and coronary artery disease (CAD), are risk factors for sepsis.[4,5](https://sciwheel.com/work/citation?ids=15423113,15062667&pre=&pre=&suf=&suf=&sa=0,0)Common comorbid conditions, like ASCVD, reduce patients’ physiologic reserve increasing the risk of developing and having adverse events following sepsis.[6](https://sciwheel.com/work/citation?ids=13486786&pre=&suf=&sa=0)

The nidus of infection leading to sepsis is born from innumerable potential sources. Critical limb threatening ischemia (CLTI) causes the development and poor healing of wounds. [5](https://sciwheel.com/work/citation?ids=15062667&pre=&suf=&sa=0) In turn, resulting in attempted limb salvage with debridement with revascularization or major amputations to both prevent and gain source control for sepsis.[4,7](https://sciwheel.com/work/citation?ids=15423113,14216773&pre=&pre=&suf=&suf=&sa=0,0) However, the association between sepsis and PAD prevalence, and how the risk of adverse outcomes is modified by the presence of PAD in people with sepsis is unclear.

Thus, we aim to establish the prevalence of PAD diagnoses among those hospitalized with sepsis using the National Inpatient Sample (NIS) and evaluate the association between PAD and in-hospital mortality and amputation among sepsis hospitalizations. We hypothesize that PAD among sepsis hospitalizations will be common and PAD will be associated with a higher adjusted risk of mortality and amputation.

1. **Data & Patients**

This is a retrospective analysis of NIS discharge data (2016-2020), deemed exempt from human subjects’ review by the University of Pittsburgh’s Human Research Protection Office (STUDY20110441). Data are deidentified, presented, and analyzed in accordance with the NIS, Healthcare Cost and Utilization Project, Agency for Healthcare Research and Quality Use Agreements and STROBE guidelines.[8,9](https://sciwheel.com/work/citation?ids=14428295,2432932&pre=&pre=&suf=&suf=&sa=0,0)

## Data Source

The NIS is the largest publicly available, all-payer, inpatient healthcare database. By sampling 20% of all short-term, non-Federal hospital stays in the United States, it allows for population-level, survey-weighted national estimates of disease burden. [10](https://sciwheel.com/work/citation?ids=14520517&pre=&suf=&sa=0)The NIS provides patient demographic, hospital characteristic, in-hospital event, and hospital discharge data. Demographic data available within the NIS includes age, sex, race/ethnicity, income quartile by ZIP code, primary payer, patient residence, and hospital location. The NIS codes race and ethnicity as a composite variable, with ethnicity and race components of the same variable. Hispanic ethnicity precedes race in this coding strategy.[10](https://sciwheel.com/work/citation?ids=14520517&pre=&suf=&sa=0)

Each hospitalization can include up to 40 *International Classification of Diseases, Tenth Revision, Clinical Modification* (ICD-10-CM) diagnosis and 25 ICD-10 *Procedure Coding System* (ICD-10-PCS) codes. The primary ICD-10-CM code delineates the primary hospitalization diagnosis and reason for admission. [11](https://sciwheel.com/work/citation?ids=14423940&pre=&suf=&sa=0) The subsequent diagnosis ICD-10-CM codes inform comorbid conditions using the Elixhauser Comorbidity categories (i.e., PAD, hypertension, end-stage renal disease)[12](https://sciwheel.com/work/citation?ids=16589274&pre=&suf=&sa=0) or validated codes (i.e., CAD, diabetes mellitus, cerebrovascular disease, antithrombotic therapy).[13](https://sciwheel.com/work/citation?ids=12072245&pre=&suf=&sa=0),[14,15](https://sciwheel.com/work/citation?ids=3333853,16567487&pre=&pre=&suf=&suf=&sa=0,0) We define extensive ASCVD as those with secondary diagnoses of both PAD and CAD. We will calculate the Elixhauser Comorbidity Index excluding peripheral vascular diseases, in order to elucidate the independent contribution of PAD to sepsis and sepsis-related mortality.[16](https://sciwheel.com/work/citation?ids=14597100&pre=&suf=&sa=0)Each ICD-10-PCS has a corresponding day of service for the procedure.[17](https://sciwheel.com/work/citation?ids=14423941&pre=&suf=&sa=0)

## Patient Population

We will include all adult (18 years) hospitalizations with either an explicit or implicit ICD-10-CM code definitions of sepsis.[18](https://sciwheel.com/work/citation?ids=14438910&pre=&suf=&sa=0) The explicit definition includes the presence of either R65.20 (sepsis) or R65.21 (septic shock) ICD-10-CM codes as a primary diagnosis. The implicit definition includes a primary ICD-10-CM code for infection and a secondary ICD-10-CM code for organ dysfunction, with the exception of obstetric codes (Appendix 1).[18](https://sciwheel.com/work/citation?ids=14438910&pre=&suf=&sa=0) We will exclude those with missing outcome (i.e., in-hospital mortality) and demographic (i.e., age, sex, or race/ethnicity) data.

Outcomes

Our primary outcome is time to in-hospital mortality. Secondary outcomes include time to in-hospital major or transmetatarsal amputation (Appendix 1), discharge disposition, and extended length of stay (eLOS). [19](https://sciwheel.com/work/citation?ids=14423995&pre=&suf=&sa=0) eLOS is defined as the proportion of patients with a hospital LOS greater than the 75th percentile.[20](https://sciwheel.com/work/citation?ids=15154364&pre=&suf=&sa=0)

1. **Statistical Analysis**

We will perform all analyses accounting for survey design. Estimated continuous variables will be presented as mean ± standard error and categorical variables as frequency (percent; 95% confidence interval [95%CI] of %). Confidence intervals for frequencies will be included as they are population estimates derived from a survey-weighted sample. T- and chi-square testing will be utilized to compare continuous and categorical baseline characteristics among those with and without PAD.

The prevalence of ASCVD among hospitalizations for sepsis will be calculated on the weighted sample. We will evaluate the association between PAD and outcomes using Cox regression models generating adjusted hazard ratios (aHR) with associated 95%CI, censoring for death and hospital discharge, as appropriate. All models will include age (continuous), race/ethnicity (White NH, Black NH, Hispanic, Asian or Pacific Islander NH, Native American NH, Other), sex (male/female), income (quartile), diabetes (yes/no), end-stage renal disease (yes/no), cerebrovascular disease (yes/no), CAD (yes/no), hypertension (yes/no), and antithrombotic therapy (yes/no) with a robust standard variance estimator.

To assess the relationship between ASCVD risk factors and outcomes for sepsis hospitalizations, we will evaluate the interaction of PAD and CAD in our main model. We will then recapitulate our models recategorizing our cohort by ASCVD risk factors: CAD without PAD , extensive ASCVD (CAD or PAD diagnoses), PAD without CAD, and no ASCVD (no CAD or PAD).

We will evaluate effect modification using interaction terms. Subgroup analyses will be conducted to identify whether antithrombotic therapy moderates the associations of PAD alone, ASCVD, and CAD alone to outcomes.

All statistical tests are two-sided, with a significance level of 0.05. Analyses and figures will be completed using StateSE 17.0 (StataCorp, College Station, TX) and PRISM 9 (GraphPad Software, La Jolla, CA).

## Sensitivity Analysis

We will conduct three sensitivity analyses to understand the robustness of our results. First, an alternative definition of mortality will be created where those going on hospice indicated mortality (Z51.5).[21](https://sciwheel.com/work/citation?ids=16589309&pre=&suf=&sa=0) Second, we will utilize a Fine-Gray model to generate subdistribution aHR on the association between PAD and amputation accounting for the competing risk of death and discharge. Fine-Gray models cannot be survey-weighted and were thus included as a sensitivity analysis to corroborate the findings of the primary analysis.[22](https://sciwheel.com/work/citation?ids=5118480&pre=&suf=&sa=0) Third, we will calculate the E-Value to quantify the potential magnitude of a single cofounder required to explain the association between PAD and the outcomes of interest.[23](https://sciwheel.com/work/citation?ids=4822436&pre=&suf=&sa=0)

**5. Project Team**

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* Megan M. Marron: Assistant Professor of Epidemiology; co-senior author
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# **Data Dictionary:** Pre-selected variables for Hospitalization Features

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Variable Description** | **Type** | **Name in dataset** |
| **Sepsis** | Implicit Sepsis1 | Dichotomous | allsepsis |
| Explicit Sepsis1 | Dichotomous | explicitsepsis |
|  | Organ Dysfunction2 | Dichotomous | organdys |
| **PAD** | PAD | Dichotomous | allPAD |
| **ASCVD** | ASCVD subgroups | Categorical  0 – No CAD/PAD  1 – PAD alone  2 – PAD and CAD  3 – CAD alone | cat |
| **Demographics** | Age | Continuous | age |
| Sex | Categorical | male |
| Race/Ethnicity3 | Categorical | race |
| Income Quartile by Patient Zip Code | Ordinal (1-4) | zipinc\_qrtl |
| Primary Payer | Categorical | pay1 |
| Patient Location: NCHS Urban-Rural Code | Categorical | pl\_nchs |
| Hospital Location & Teaching Status | Categorical | hosp\_locteach |
| **Comorbidities** | Diabetes mellitus2 | Dichotomous | cm\_dm |
| Cerebrovascular disease2 | Dichotomous | cvd |
| End-stage renal disease2 | Dichotomous | esrd |
| Hypertension2 | Dichotomous | htn |
| CAD2 | Dichotomous | cad |
| Anticoagulants | Dichotomous | chronic\_ac |
| Antiplatelets | Dichotomous | chronic\_ap |
| Antithrombotics | Dichotomous | chronic\_at |
| Modified Elixhauser Comorbidity Index4 | Continuous | elix |
| **Outcomes** | In-hospital mortality | Dichotomous | died |
| Mortality (including hospice) | Dichotomous | hospice |
| Extended Length of Stay5 | Continuous | extLOS |
| Discharge Disposition | Categorical | dispuniform |
| First day in the OR6 | Continuous | first\_or\_day |
| Procedure on first day in the OR6 | Categorical | first\_or\_i10\_pr`num' |
| If first procedure was a revascularization7 | Dichotomous | revasc |
| Return to OR after revascularization6 | Continuous | rtor\_i10\_pr`num' |
| Amputation on return to OR date or first procedure is an amputation6 | Categorical | rtor\_amp`num' |
| Major or transmetatarsal amputation7 | Dichotomous | cens\_rtor\_amp |
| Amputation date6 | Continuous | amp\_day`num' |
| Date of amputation or death/discharge if no amputation | Continuous | event\_day |
| Censoring variable for competing risk of death for Fine Gray | Categorical | cens\_rtor\_amp\_fg |
| **Coding Details** | 1Using diagnosis codes from i10\_dx1 category  2Using diagnosis codes from i10\_dx2--i10\_dx40 categories/Elixhauser definition  3Ethnicity was coded as race = 3 in NIS  4ExlcudingPAD  5Extended length of stay is days above median length of stay for PAD/no PAD groups  6Procedure days from prday1-prday25  7Using procedure codes from i10\_pr1--i10\_pr25 categories | | |

**Appendix**: RelevantICD-10-CM and ICD-10-PCS Codes

|  |  |
| --- | --- |
| Explicit Sepsis (All Codes) | R65.20, R.65.21 |
| Implicit Sepsis (All Codes) | A000, A001, A009, A0100, A011, A012, A013, A014, A020, A021, A0220, A0221, A0222, A0223, A0224, A0229, A028, A029, A030, A031, A032, A033, A038, A039, A040, A041, A042, A043, A044, A045, A046, A0471, A0472, A048, A049, A050, A051, A052, A053, A054, A055, A058, A059, A080, A0811, A0819, A082, A0831, A0832, A0839, A088, A09, A170, A171, A1781, A1782, A1789, A179, A192, A198, A199, A200, A201, A202, A207, A208, A209, A210, A211, A212, A213, A217, A218, A219, A220, A221, A222, A227, A228, A229, A230, A231, A232, A233, A238, A239, A240, A243, A249, A250, A251, A259, A267, A268, A269, A270, A2781, A2789, A279, A280, A288, A289, A3211, A3212, A327, A3281, A3289, A329, A34, A35, A360, A361, A362, A363, A3681, A3682, A3683, A3684, A3685, A3686, A3689, A369, A3700, A3710, A3780, A3790, A389, A390, A391, A394, A3950, A3951, A3952, A3953, A3981, A3982, A3983, A3989, A399, A403, A409, A4101, A4102, A411, A412, A413, A414, A4150, A4151, A4152, A4153, A4159, A4189, A419, A420, A421, A422, A4281, A4282, A4289, A429, A438, A439, A46, A480, A481, A483, A4851, A4852, A488, A493, A5400, A5401, A5403, A5421, A5422, A5423, A5424, A5429, A5431, A5432, A5433, A5439, A5440, A5441, A5442, A5449, A545, A546, A5481, A5483, A5485, A5486, A5489, A690, A691, B370, B371, B372, B373, B3742, B3749, B375, B376, B377, B3781, B3782, B3783, B3784, B3789, B379, B380, B381, B382, B383, B384, B3889, B389, B39, B40, B41, B42, B43, B44, B450, B451, B457, B459, B469, B470, B471, B479, B480, B481, B482, B488, B49, B950, B951, B952, B953, B954, B955, B9561, B9562, B957, B958, B960, B961, B9620, B9621, B9622, B9623, B9629, B963, B964, B965, B966, B967, B9681, B9689, D65, D688, D689, D6951, D6959, D696, E832, F05, G000, G001, G002, G003, G008, G009, G01, G02, G042, G060, G061, G062, G08, G931, G9340, G9341, G9349, H0500, H05019, H05029, H05039, H05049, H0510, H05119, H05129, H0520, H05219, H05229, H05239, H05249, H05259, H05269, H0530, H05319, H05329, H05339, H05349, H05359, H05409, H05419, H05429, H0553, H05819, H05829, H0589, H059, H16249, H32, H33129, H44009, H44019, H44029, H44119, H44129, H44139, H4419, H4420, H4421, H4422, H4423, H442A1, H442A2, H442A3, H442A9, H442B1, H442B2, H442B3, H442B9, H442C1, H442C2, H442C3, H442C9, H442D1, H442D2, H442D3, H442D9, H442E1, H442E2, H442E3, H442E9, H4430, H44319, H44329, H44399, H4440, H44419, H44429, H44439, H44449, H4450, H44519, H44529, H44539, H44609, H44619, H44629, H44639, H44649, H44659, H44699, H44709, H44719, H44729, H44739, H44749, H44759, H44799, H44819, H44829, H4489, H449, H6020, I308, I32, I330, I339, I39, I6783, I951, I952, I953, I9581, I9589, I959, J0100, J0110, J0120, J0130, J0140, J0190, J020, J029, J0300, J0390, J040, J0410, J0411, J042, J0430, J0431, J050, J0510, J0511, J060, J069, J13, J14, J150, J151, J1520, J15211, J15212, J1529, J153, J154, J155, J156, J158, J159, J17, J180, J181, J189, J36, J441, J471, J479, J80, J850, J851, J852, J853, J860, J869, J9600, J9610, J9620, J9690, J984, K046, K047, K113, K122, K352, K353, K3580, K3589, K36, K37, K5712, K5713, K5732, K5733, K610, K611, K613, K630, K631, K650, K651, K652, K653, K654, K658, K659, K67, K6811, K6812, K6819, K689, K7200, K7210, K7290, K7291, K750, K751, K762, K763, K766, K767, K810, K811, K812, K819, K820, K821, K822, K823, K824, K828, K829, K9081, K9402, L03019, L03029, L03039, L03049, L03119, L03129, L03211, L03212, L03213, L03221, L03222, L03317, L03319, L03329, L03811, L03818, L03891, L03898, L0390, L0391, L049, L0501, L0502, L05091, L0592, L080, L081, L0889, L089, L88, L980, M0000, M00019, M00029, M00039, M00049, M00059, M00069, M00079, M0008, M0009, M0010, M00119, M00129, M00139, M00149, M00159, M00169, M00179, M0018, M0019, M0020, M00219, M00229, M00239, M00249, M00259, M00269, M00279, M0028, M0029, M0080, M00819, M00829, M00839, M00849, M00859, M00869, M00879, M0088, M0089, M009, M01X0, M01X19, M01X29, M01X39, M01X49, M01X59, M01X69, M01X79, M01X8, M01X9, M0210, M02119, M02129, M02139, M02149, M02159, M02169, M02179, M0218, M0219, M0230, M02319, M02329, M02339, M02349, M02359, M02369, M02379, M0238, M0239, M272, M352, M4620, M4630, M60009, M726, M8610, M86119, M86129, M86139, M86149, M86159, M86169, M86179, M8618, M8619, M8620, M86219, M86229, M86239, M86249, M86259, M86269, M86279, M8628, M8629, M8660, M86619, M86629, M86639, M86642, M86659, M86669, M86679, M8668, M8669, M869, M8960, M89619, M89629, M89639, M89649, M89659, M89669, M89679, M8968, M8969, M9080, M90819, M90829, M90839, M90849, M90859, M90869, M90879, M9088, M9089, N10, N110, N118, N12, N139, N151, N159, N16, N170, N171, N172, N178, N179, N2884, N2885, N2886, N360, N361, N362, N3641, N3642, N365, N368, N369, N390, N398, N399, N410, N411, N412, N413, N414, N418, N419, N451, N452, N453, N454, N51, N7001, N7002, N7003, N7011, N7012, N7013, N7091, N7092, N7093, N710, N711, N719, N730, N731, N732, N733, N734, N736, N738, N739, N751, N764, R0603, R0681, R092, R310, R311, R3121, R3129, R319, R570, R571, R578, R579, R6521, R7881, T798XXA, T80211A, T80212A, T80219A, T8022XA, T8029XA, T814XXA, T826XXA, T827XXA, T83510A, T83511A, T83512A, T83518A, T83590A, T83591A, T83592A, T83593A, T83598A, T8361XA, T8362XA, T8369XA, T8450XA, T8460XA, T847XXA, T8571XA, T85730A, T85731A, T85732A, T85733A, T85734A, T85735A, T85738A, T8579XA, T880XXA, Z332 |
| Organ Dysfunction | D65, D68.8, D68.9, D69.51, D69.59, D69.6, F05, G931, G9340, G9341, G9349, I6783, I951, I952, I953, I9581, I9589, I959, J80, J9600, J9690, K72.00, K76.2, K76.3, N170, N171, N172, N178, N179, R0603, R0681, R092, R57.0, R57.1, R57.8, R57.9, R65.21, J9610, J9620, J984 |
| Peripheral Artery Disease | Utilized Elixhauser Definition |
| Revascularization | **Infrainguinal open revascularization:** 041K09J, 041K09K, 041K0AJ, 041K0AK, 041K0JJ, 041K0JK, 041K0KJ, 041K0KK, 041K0ZJ, 041K0ZK, 041K49J, 041K49K, 041K4AJ, 041K4AK, 041K4JJ, 041K4JK, 041K4KJ, 041K4KK, 041K4ZJ, 041K4ZK, 041L09H, 041L09K, 041L0AH, 041L0AK, 041L0JH, 041L0JK, 041L0KH, 041L0KK, 041L0ZH, 041L0ZK, 041L49H, 041L49K, 041L4AH, 041L4AK, 041L4JH, 041L4JK, 041L4KH, 041L4KK, 041L4ZH, 041L4ZK, 041K09H, 041K09L, 041K09M, 041K09N, 041K09P, 041K09Q, 041K09S, 041K0AH, 041K0AL, 041K0AM, 041K0AN, 041K0AP, 041K0AQ, 041K0AS, 041K0JH, 041K0JL, 041K0JM, 041K0JN, 041K0JP, 041K0JQ, 041K0JS, 041K0KH, 041K0KL, 041K0KM, 041K0KN, 041K0KP, 041K0KQ, 041K0KS, 041K0ZH, 041K0ZL, 041K0ZM, 041K0ZN, 041K0ZP, 041K0ZQ, 041K0ZS, 041K49H, 041K49L, 041K49M, 041K49N, 041K49P, 041K49Q, 041K49S, 041K4AH, 041K4AL, 041K4AM, 041K4AN, 041K4AP, 041K4AQ, 041K4AS, 041K4JH, 041K4JL, 041K4JM, 041K4JN, 041K4JP, 041K4JQ, 041K4JS, 041K4KH, 041K4KL, 041K4KM, 041K4KN, 041K4KP, 041K4KQ, 041K4KS, 041K4ZH, 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**Infrainguinal endovascular revascularization:** 47K041, 047K04Z, 047K05Z, 047K06Z, 047K07Z, 047K0D1, 047K0DZ, 047K0EZ, 047K0FZ, 047K0GZ, 047K0Z1, 047K0ZZ, 047K341, 047K34Z, 047K35Z, 047K36Z, 047K37Z, 047K3D1, 047K3DZ, 047K3EZ, 047K3FZ, 047K3GZ, 047K3Z1, 047K3ZZ, 047K441, 047K44Z, 047K45Z, 047K46Z, 047K47Z, 047K4D1, 047K4DZ, 047K4EZ, 047K4FZ, 047K4GZ, 047K4Z1, 047K4ZZ, 047L041, 047L04Z, 047L05Z, 047L06Z, 047L07Z, 047L0D1, 047L0DZ, 047L0EZ, 047L0FZ, 047L0GZ, 047L0Z1, 047L0ZZ, 047L341, 047L34Z, 047L35Z, 047L36Z, 047L37Z, 047L3D1, 047L3DZ, 047L3EZ, 047L3FZ, 047L3GZ, 047L3Z1, 047L3ZZ, 047L441, 047L44Z, 047L45Z, 047L46Z, 047L47Z, 047L4D1, 047L4DZ, 047L4EZ, 047L4FZ, 047L4GZ, 047L4Z1, 047L4ZZ, 047M041, 047M04Z, 047M05Z, 047M06Z, 047M07Z, 047M0D1, 047M0DZ, 047M0EZ, 047M0FZ, 047M0GZ, 047M0Z1, 047M0ZZ, 047M341, 047M34Z, 047M35Z, 047M36Z, 047M37Z, 047M3D1, 047M3DZ, 047M3EZ, 047M3FZ, 047M3GZ, 047M3Z1, 047M3ZZ, 047M441, 047M44Z, 047M45Z, 047M46Z, 047M47Z, 047M4D1, 047M4DZ, 047M4EZ, 047M4FZ, 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047Y341, 047Y34Z, 047Y3D1, 047Y3DZ, 047Y3Z1, 047Y3ZZ, 047Y441, 047Y44Z, 047Y4D1, 047Y4DZ, 047Y4Z1, 047Y4ZZ  **Suprainguinal endovascular revascularization (iliac only):** 047C041, 047C04Z, 047C05Z, 047C06Z, 047C07Z, 047C0D1, 047C0DZ, 047C0EZ, 047C0FZ, 047C0GZ, 047C0Z1, 047C0ZZ, 047C341, 047C34Z, 047C35Z, 047C36Z, 047C37Z, 047C3D1, 047C3DZ, 047C3EZ, 047C3FZ, 047C3GZ, 047C3Z1, 047C3ZZ, 047C441, 047C44Z, 047C45Z, 047C46Z, 047C47Z, 047C4D1, 047C4DZ, 047C4EZ, 047C4FZ, 047C4GZ, 047C4Z1, 047C4ZZ, 047D041, 047D04Z, 047D05Z, 047D06Z, 047D07Z, 047D0D1, 047D0DZ, 047D0EZ, 047D0FZ, 047D0GZ, 047D0Z1, 047D0ZZ, 047D341, 047D34Z, 047D35Z, 047D36Z, 047D37Z, 047D3D1, 047D3DZ, 047D3EZ, 047D3FZ, 047D3GZ, 047D3Z1, 047D3ZZ, 047D441, 047D44Z, 047D45Z, 047D46Z, 047D47Z, 047D4D1, 047D4DZ, 047D4EZ, 047D4FZ, 047D4GZ, 047D4Z1, 047D4ZZ, 047E041, 047E04Z, 047E05Z, 047E06Z, 047E07Z, 047E0D1, 047E0DZ, 047E0EZ, 047E0FZ, 047E0GZ, 047E0Z1, 047E0ZZ, 047E341, 047E34Z, 047E35Z, 047E36Z, 047E37Z, 047E3D1, 047E3DZ, 047E3EZ, 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| Amputation | Major amputation: 0Y620ZZ, 0Y630ZZ, 0Y640ZZ, 0Y670ZZ, 0Y680ZZ, 0Y6C0Z1, 0Y6C0Z2, 0Y6C0Z3, 0Y6D0Z1, 0Y6D0Z2, Y6D0Z3, 0Y6F0ZZ, 0Y6G0ZZ, 0Y6H0Z1, 0Y6H0Z2, 0Y6H0Z3, 0Y6J0Z1, 0Y6J0Z2 , 0Y6J0Z3  Minor (Transmetatarsal amputation): 0Y6M0Z0, 0Y6M0Z4, 0Y6M0Z5, 0Y6M0Z6, 0Y6M0Z7, 0Y6M0Z8, 0Y6M0Z9, 0Y6M0ZB , 0Y6M0ZC, 0Y6M0ZD, 0Y6M0ZF, 0Y6N0Z0, 0Y6N0Z4, 0Y6N0Z5 , 0Y6N0Z6, 0Y6N0Z7, 0Y6N0Z8, 0Y6N0Z9, 0Y6N0ZB, 0Y6N0ZC , 0Y6N0ZD, 0Y6N0ZF |
| Coronary Artery Disease | I20.0, I20.1, I20.2, I20.8, I20.9, I21.0, I21.01, I21.02, I21.09, I21.1, I21.11, I21.19, I21.2, I21.21, I21.29, I21.3, I21.4, I21.9, I21.A1, I21.A9, I22.0, I22.1, I22.2, I22.8, I22.9, I23.0, I23.1, I23.2, I23.3, I23.4, I23.5, I23.6, I23.7, I23.8, I24.0, I24.1, I24.8, I24.9, I25.0, I25.10, I25.110, I25.111, I25.112, I25.118, I25.119, I25.2, I25.700, I25.701, I25.702, I25.708, I25.709, I25.710, I25.711, I25.712, I25.718, I25.719, I25.720, I25.721, I25.722, I25.728, I25.729, I25.730, I25.731, I25.732, I25.738, I25.739, I25.750, I25.751, I25.752, I25.758, I25.759, I25.760, I25.761, I25.762, I25.768, I25.769, I25.790, I25.791, I25.792, I25.798, I25.799, I25.810, I25.82, I25.83, I25.84, I25.89, I25.9 |
| Type 2 Diabetes Mellitus | E0821, E0822, E0829, E08311, E08319, E08321, E083211, E083212, E083213, E083219, E08329, E083291, E083292, E083293, E083299, E08331, E083311, E083312, E083313, E083319, E08339, E083391, E083392, E083393, E083399, E08341, E083411, E083412, E083413, E083419, E08349, E083491, E083492, E083493, E083499, E08351, E083511, E083512, E083513, E083519, E083521, E083522, E083523, E083529, E083531, E083532, E083533, E083539, E083541, E083542, E083543, E083549, E083551, E083552, E083553, E083559, E08359, E083591, E083592, E083593, E083599, E0836, E0837X1, E0837X2, E0837X3, E0837X9, E0839, E0840, E0841, E0842, E0843, E0844, E0849, E0851, E0852, E0859, E08610, E08618, E08620, E08621, E08622, E08628, E08630, E08638, E08641, E08649, E0865, E0869, E088, E0921, E0922, E0929, E09311, E09319, E09321, E093211, E093212, E093213, E093219, E09329, E093291, E093292, E093293, E093299, E09331, E093311, E093312, E093313, E093319, E09339, E093391, E093392, E093393, E093399, E09341, E093411, E093412, E093413, E093419, E09349, E093491, E093492, E093493, E093499, E09351, E093511, E093512, E093513, E093519, E093521, E093522, E093523, E093529, E093531, E093532, E093533, E093539, E093541, E093542, E093543, E093549, E093551, E093552, E093553, E093559, E09359, E093591, E093592, E093593, E093599, E0936, E0937X1, E0937X2, E0937X3, E0937X9, E0939, E0940, E0941, E0942, E0943, E0944, E0949, E0951, E0952, E0959, E09610, E09618, E09620, E09621, E09622, E09628, E09630, E09638, E09641, E09649, E0965, E0969, E098, E1121, E1122, E1129, E11311, E11319, E11321, E113211, E113212, E113213, E113219, E11329, E113291, E113292, E113293, E113299, E11331, E113311, E113312, E113313, E113319, E11339, E113391, E113392, E113393, E113399, E11341, E113411, E113412, E113413, E113419, E11349, E113491, E113492, E113493, E113499, E11351, E113511, E113512, E113513, E113519, E113521, E113522, E113523, E113529, E113531, E113532, E113533, E113539, E113541, E113542, E113543, E113549, E113551, E113552, E113553, E113559, E11359, E113591, E113592, E113593, E113599, E1136, E1137X1, E1137X2, E1137X3, E1137X9, E1139, E1140, E1141, E1142, E1143, E1144, E1149, E1151, E1152, E1159, E11610, E11618, E11620, E11621, E11622, E11628, E11630, E11638, E11641, E11649, E1165, E1169, E118, E1321, E1322, E1329, E13311, E13319, E13321, E133211, E133212, E133213, E133219, E13329, E133291, E133292, E133293, E133299, E13331, E133311, E133312, E133313, E133319, E13339, E133391, E133392, E133393, E133399, E13341, E133411, E133412, E133413, E133419, E13349, E133491, E133492, E133493, E133499, E13351, E133511, E133512, E133513, E133519, E133521, E133522, E133523, E133529, E133531, E133532, E133533, E133539, E133541, E133542, E133543, E133549, E133551, E133552, E133553, E133559, E13359, E133591, E133592, E133593, E133599, E1336, E1337X1, E1337X2, E1337X3, E1337X9, E1339, E1340, E1341, E1342, E1343, E1344, E1349, E1351, E1352, E1359, E13610, E13618, E13620, E13621, E13622, E13628, E13630, E13638, E13641, E13649, E1365, E1369, E138, E0800, E0801, E0810, E0811, E089, E0900, E0901, E0910, E0911, E099, E1100, E1101, E1110, E1111, E119, E1300, E1301, E1310, E1311, E139, O24011, O24012, O24013, O24019, O2402, O2403, O24111, O24112, O24113, O24119, O2412, O2413, O24311, O24312, O24313, O24319, O2432, O2433, O24410, O24414, O24415, O24419, O24420, O24424, O24425, O24429, O24430, O24434, O24435, O24439, O24811, O24812, O24813, O24819, O2482, O2483, O24911, O24912, O24913, O24919, O2492, O2493 |
| End Stage Renal Disease | Utilized Elixhauser definition |
| Cerebrovascular Disease | I6000, I6001, I6002, I6010, I6011, I602, I6030, I6031, I6032, I604, I6050, I6051, I606, I607, I608, I609, I601, I611, I612, I613, I614, I615, I616, I617, I618, I619, I6300, I63011, I63012, I63013, I63019, I6302, I63031, I63032, I63033, I63039, I6309, I6310, I63111, I63112, I63113, I63119, I6312, I63131, I63132, I63133, I63139, I6319, I6320, I63211, I63212, I63213, I63219, I6322, I63231, I63232, I63233, I63239, I6329, I6330, I63311, I63312, I63313, I63319, I63321, I63322, I63323, I63329, I63331, I63332, I63333, I63339, I63341, I63342, I63343, I63343, I63349, I6339, I6349, I63411, I63412, I63413, I63419, I63421, I63422, I63423, I63429, I63431, I63432, I63433, I63439, I63441, I63442, I63443, I63449, I6349, I6350, I63511, I63512, I63513, I63519, I63521, I63522, I63523, I63529, I63531, I63532, I63533, I63539, I63541, I63542, I63543, I63549, I6359, I636, I6381, I6389, I639, I6501, I6502, I6503, I6509, I651, I6521, I6522, I6523, I6529, I658, I659, I6601, I6602, I6603, I6609, I6611, I6612, I6613, I6619, I6621, I6622, I6623, I6629, I663, I668, I669, I670, I671, I672, I673, I674, I675, I676, I677, I6781, I6782, I6783, I67841, I67848, I67850, I67858, I6789, I679, I6900, I69010, I69011, I69012, I69013, I69014, I69015, I69018, I69019, I69020, I69021, I69022, I69023, I69028, I69031, I69032, I69033, I69034, I69039, I69041, I69042, I69043, I69044, I69049, I69051, I69052, I69053, I69054, I69059, I69061, I69062, I69063, I69064, I69065, I69069, I69090, I69091, I69092, I69093, I69098, I6910, I69110, I69111, I69112, I69113, I69114, I69115, I69118, I69119, I69120, I69121, I69122, I69123, I69128, I69131, I69132, I69133, I69134, I69139, I69141, I69142, I69143, I69144, I69149, I69151, I69152, I69153, I69154, I69159, I69161, I69162, I69163, I69164, I69165, I69169, I69190, I69191, I69192, I69193, I69198, I6920, I69210, I69211, I69212, I69213, I69214, I69215, I69218, I69219, I69220, I69221, I69222, I69223, I69228, I69231, I69232, I69233, I69234, I69239, I69241, I69242, I69243, I69244, I69249, I69251, I69252, I69253, I69254, I69259, I69261, I69262, I69263, I69264, I69265, I69269, I69290, I69291, I69292, I69293, I69298, I6930, I69310, I69311, I69312, I69313, I69314, I69315, I69318, I69319, I69320, I69321, I69322, I69323, I69328, I69331, I69332, I69333, I69334, I69339, I69341, I69342, I69343, I69344, I69349, I69351, I69352, I69353, I69354, I69359, I69361, I69362, I69363, I69364, I69365, I69369, I69390, I69391, I69392, I69393, I69398, I6980, I69810, I69811, I69812, I69813, I69814, I69815, I69818, I69819, I69820, I69821, I69822, I69823, I69828, I69831, I69832, I69833, I69834, I69839, I69841, I69842, I69843, I69844, I69849, I69851, I69852, I69853, I69854, I69859, I69861, I69862, I69863, I69864, I69869, I69890, I69891, I69892, I69893, I69898, I6990, I69910, I69911, I69912, I69913, I69914, I69915, I69918, I69919, I69920, I69921, I69922, I69923, I69928, I69931, I69932, I69933, I69934, I69939, I69941, I69942, I69943, I69944, I69949, I69951, I69952, I69953, I69954, I69959, I69961, I69962, I69963, I69964, I69965, I69969, I69990, I69991, I69992, I69993, I69998, H3410, H311, H3412, H3413, G450, G451, G452, G453, G454, G458, G459 |
| Hypertension | Utilized Elixhauser definition |