**Supplemental Table 1. Classification scheme for ICD-10 diagnostic codes assigned to Emergency Department and Urgent Care Clinic visits**

The following classification scheme largely follows the approach proposed by Chua KP, Fischer MA, Linder JA. Appropriateness of outpatient antibiotic prescribing among privately insured US patients: ICD-10-CM based cross sectional study. *BMJ.* 2019;364:k5092. Deviations from Chua et al’s approach are described in the footnotes.

|  |  |  |  |
| --- | --- | --- | --- |
| **ICD-10 Code** | **Appropriate** **(tier 1)** | **Potentially appropriate** **(tier 2)** | **Inappropriate** **(tier 3)** |
| **A00-B99: Certain infections and parasitic diseases** | Amebiasis, intestinal infections, rickettsioses, sexually transmitted diseases, spirochetal infections, toxoplasmosis, tuberculosis, zoonotic and other bacterial infections | Cholera, bacterial food poisoning except botulism, enteritis due to campylobacter or yersinia or unspecified infections, E.coli other than enterohemorrhagic E.coli, protozoal diseases (e.g. giardiasis), salmonella (enteritis and localized infections), shigellosis,  | All remaining codes, including botulism, dermatophytosis, enterohemorrhagic E.coli, helminths, malaria, mycoses |
| **C00-D49: Neoplasms** | None | None | All codes |
| **D50-D89: Diseases of blood and blood-forming organs and certain disorders involving the immune mechanism** | Sickle cell disorders with acute chest syndrome, splenic abscess | Accidental puncture of spleen, neutropenia, sickle cell disease with crisis or splenic sequestration | All remaining codes |
| **E00-E89: Endocrine, nutritional, and metabolic diseases** | Abscess (thymus), diabetes with peripheral neuropathy and gangrene,  | Accidental puncture of endocrine organs, cystic fibrosis, thyroiditis (acute and unspecified) | All remaining codes |
| **F01-F99: Mental, behavioral, and neurodevelopmental disorders** | None | None | All codes |
| **G00-G99: Diseases of the nervous system** | Abscess of central nervous system, bacterial meningitis | Accidental puncture of nervous system organs, encephalitis, encephalomyelitis, meningitis not included in tier 1, myelitis, thrombophlebitis (intracranial and intraspinal) | All remaining codes |
| **H00-H59: Diseases of the eye and adnexa** | Orbital cellulitis | Abscess of eye or eyelid, accidental puncture of eye, blepharitis, chorioretinitis, dacryoadenitis, dacrocystitis, endophthalmitis, foreign body (retained), granuloma, iridocyclitis, keratitis, lacrimal canaliculitis, myositis, optic neuritis, orbital inflammation (chronic), orbital periostitis, panophthalmitis, panuveitis, postprocedural bleb infection, posterior cyclitis, tenonitis  | All remaining codes |
| **H60-H95: Diseases of the ear and mastoid process** | Malignant otitis externa, mastoiditis including abscess, petrositis | Accidental puncture of ear, chondritis and perichondritis, labyrinthitis, myringitis, otitis externa (infective, non-malignant), otitis media (suppurative), tympanic membrane perforation | All remaining codes, including non-infective otitis externa, non-suppurative otitis media |
| **I00-I99: Diseases of the circulatory system** | Acute rheumatic fever, endocarditis, gangrene, septic embolism | Accidental puncture of circulatory organ, lymphadenitis, lymphangitis, myocarditis (acute), pericarditis (acute), thrombophlebitis | All remaining codes |
| **J00-J99: Diseases of the respiratory system** | Abscess (lung, mediastinum, parapharyngeal, peritonsillar, retropharyngeal), bacterial pneumonia including ventilator-associated pneumonia, epiglottitis/ supraglottitis1, mediastinitis, pyothorax, strep pharyngitis and tonsillitis, tracheostomy stoma infection | Accidental puncture of respiratory organ, adenoiditis (chronic), bronchiectasis, chronic obstructive pulmonary disease, influenza with pneumonia or respiratory manifestations or otitis media, pharyngitis, pleural effusion, sinusitis (acute and chronic), tonsillitis (non-streptococcal), tracheitis, tracheostomy complication | All remaining codes, including asthma, bronchitis and bronchiolitis, (acute), croup, influenza without pneumonia, laryngitis, laryngopharyngitis, laryngotracheitis, nasopharyngitis (acute and chronic), rhinitis and allergic rhinitis, upper respiratory infection (acute), viral pneumonia  |
| **K00-K95: Diseases of the digestive system** | Abscess (e.g. intra-abdominal, periapical or salivary gland), appendicitis, cholangitis, cholecystitis, diverticulitis, hernias with gangrene, ostomy infection, pancreatitis (acute) with infected necrosis, perforation of digestive organ, peritonitis, pouchitis, tropical sprue, Whipple’s disease  | Abscess (anal and rectal), accidental puncture of digestive organ, esophagitis, fistulas of digestive tract, gingivitis, inflammatory bowel disease without abscess, obstruction of gall bladder or bile duct, periodontitis, peptic ulcers without perforation, portal vein phlebitis, pulpitis, sclerosing mesenteritis, sialadenitis | All remaining codes |
| **L00-L99: Diseases of the skin and subcutaneous tissue** | Cellulitis2, staphylococcal scalded skin syndrome | Abscess (cutaneous), accidental puncture of skin, acne, carbuncle, dermatitis (infective), erythrasma, furuncle, impetigo, ingrown nail, lymphangitis, omphalitis, pilonidal cyst, pyoderma, rosacea, ulcers (chronic and pressure), pyoderma, rosacea,  | All remaining codes |
| **M00-M99: Disorders of the musculoskeletal systems and connective tissue** | Discitis (pyogenic), necrotizing fasciitis, osteomyelitis (acute), septic arthritis, synovitis (infective), tendon sheath abscess, tenosynovitis (infective)  | Accidental puncture of musculoskeletal system, bursitis (infective and other), discitis (unspecified), jaw alveolitis, myositis (infective and other), osteomyelitis (chronic)3, panniculitis, reactive arthropathies, spondylopathies (other infective),  | All remaining codes |
| **N00-N99: Disorders of the genitourinary systems** | Abscess, cystitis (acute), cystostomy infection, Fournier’s gangrene, hydrocele (infected), oophoritis, parametritis, pelvic inflammatory disease, pelvic peritonitis, prostatitis (acute), pyelonephritis (acute), salpingitis, trigonitis, urinary tract infection | Accidental puncture of genitourinary organ, balanitis and balanoposthitis, Bartholin’s gland cyst, hronic infections (cystitis and pyelonephritis), cystitis (other and unspecified), epididymitis, fistula (vaginal-intestinal, intestine-vesicular), mastitis, orchitis, prostatitis (chronic), pyelitis cystica, pyeloureteritis cystica, ureteritis cystica, urethritis, vaginal or vulvar ulcer, vaginitis, vesiculo-ureteral reflux, vulvar abscess, vulvitis | All remaining codes |
| **O00-O9A: Pregnancy, childbirth, and puerperium** | Amniotic sac infection, bacterial infection or genitourinary infection or septic shock after abortion or during and after pregnancy, puerperal sepsis, septic embolism | Aspiration pneumonitis in pregnancy, breast abscess, maternal infectious and parasitic diseases (other and unspecified), nipple infection, perineal laceration, premature rupture of membranes, shock (unspecified) after abortion, thrombophlebitis (superficial) in pregnancy | All remaining codes |
| **P00-P96: Certain conditions originating in the perinatal period**4 | None | None | All codes |
| **Q00-Q99.9: Congenital malformations, deformations, and chromosomal abnormalities** | None | None | All codes |
| **R00-R99: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified** | Severe sepsis | Abnormal microbiological findings, bacteriuria, shock (other and unspecified),  | All remaining codes, including symptoms such as cough, fever, etc. |
| **S00-T88: Injury, poisoning, and certain other consequences of external causes** | Amputation, amputation stump infection or dehiscence, avulsions, central venous catheter infection, hardware infection, open bites, open fractures, organ transplant infection, perforation due to surgical complication, septic shock | Abrasions, bites (insect and other superficial), blisters, burns (2nd and 3rd degree), foreign bodies and complications of foreign bodies left in body after surgery, frostbite, lacerations (blood vessels and internal organs)5, lacerations (skin and soft tissues), open wounds, post-procedural or post-infusion infections, post-procedural shock (other and unspecified), puncture wounds, sexual abuse | All remaining codes |
| **V00-Y99: External causes of morbidity** | Animal bites | Burn due to accident with watercraft, contact with contaminated medical substances or hypodermic needles, failure of sterile precautions, foreign bodies entering skin | All remaining codes |
| **Z00-Z99: Factors influencing health and contact with health services** | None | Carrier of bacterial diseases, contact with and exposure to bacterial communicable diseases, retained foreign bodies, screening for sexually transmitted diseases | All remaining codes |

1. Epiglottitis/supraglottitis is a life-threatening condition that is often infectious in etiology. This was reclassified from potentially appropriate (Tier 2) to appropriate (Tier 1), as empiric antibiotics would be reasonable given the condition’s severity.
2. Cellulitis was moved from potentially appropriate (Tier 2) to appropriate (Tier 1), as the primary treatment for cellulitis is antibiotic therapy.
3. Osteomyelitis was divided into acute and chronic. Chronic osteomyelitis was moved from appropriate (Tier 1) to potentially appropriate (Tier 2), as many cases of chronic osteomyelitis do not require antibiotic therapy.
4. All conditions associated with the perinatal period were coded as inappropriate (Tier 3), because patients within our VHA cohort could not be correctly assigned any of these diagnostic codes.
5. Lacerations of blood vessels and internal organs were re-classified from inappropriate (Tier 3) to potentially appropriate (Tier 2). This was done to be consistent with the coding for both lacerations of skin/soft tissues and for accidental punctures of internal organs.