Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.
### eAppendix 1. List of *International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM)* Codes Used to Determine Presumed Site of Infection

#### A. Bone/Joint

| ICD-9-CM CODE | DESCRIPTION                        |
|---------------|-----------------------------------|
| '0955 '       | SYphilis of Bone                  |
| '09850'       | Gonococcal Arthritis              |
| '09853'       | Gonococcal Spondylitis            |
| '09859'       | GC Infect Joint NEC               |
| '00323'       | Salmonella Arthritis              |
| '00324'       | Salmonella Osteomyelitis          |
| '0261 '       | Streptobacillary Fever            |
| '03682'       | Meningococcal Arthropathy         |
| '05671'       | Arthritis due to Rubella          |
| '7300'        | Acute Osteomyelitis               |
| '71100'       | Pyogen Arthritis-Unspec           |
| '71101'       | Pyogen Arthritis-Shoulder         |
| '71102'       | Pyogen Arthritis-Up/Arm           |
| '71103'       | Pyogen Arthritis-Forearm          |
| '71104'       | Pyogen Arthritis-Hand             |
| '71105'       | Pyogen Arthritis-Pelvis           |
| '71106'       | Pyogen Arthritis-L/Leg            |
| '71107'       | Pyogen Arthritis-Ankle            |
| '71108'       | Pyogen Arthritis Nec              |
| '71109'       | Pyogen Arthritis-Mult             |
| '71160'       | Mycotic Arthritis-Unspec          |
| '71161'       | Mycotic Arthritis-Shoulder        |
| '71162'       | Mycotic Arthritis-Up/Arm          |
| '71163'       | Mycotic Arthritis-Forearm         |
| '71164'       | Mycotic Arthritis-Hand            |
| '71165'       | Mycotic Arthritis-Pelvis          |
| '71166'       | Mycotic Arthritis-L/Leg           |
| '71167'       | Mycotic Arthritis-Ankle           |
| '71168'       | Mycotic Arthritis Nec             |
| '71169'       | Mycotic Arthritis-Mult            |
| '71170'       | Helminth Arthritis-Unspec         |
| '71171'       | Helminth Arthritis-Shoulder       |
| '71172'       | Helminth Arthritis-Up/Arm         |
| '71173'       | Helminth Arthritis-Forearm        |
| '71174'       | Helminth Arthritis-Hand           |
| '71175'       | Helminth Arthritis-Pelvis         |
| '71176'       | Helminth Arthritis-L/Leg          |
| '71177'       | Helminth Arthritis-Ankle          |

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| Code   | Description               |
|--------|---------------------------|
| '71178'| HELMINTH ARTHRIT NEC      |
| '71179'| HELMINTH ARTHRIT-MULT     |
| '71180'| INF ARTHRITIS NEC-UNSPEC  |
| '71181'| INF ARTHRITIS NEC-SHilder |
| '71182'| INF ARTHRITIS NEC-UP/ARM  |
| '71183'| INF ARTHRITIS NEC-FOREARM |
| '71184'| INF ARTHRITIS NEC-HAND    |
| '71185'| INF ARTHRITIS NEC-PELVIS  |
| '71186'| INF ARTHRITIS NEC-L/LEG   |
| '71187'| INF ARTHRITIS NEC-ANKLE   |
| '71188'| INF ARTHRITIS NEC-OTH SITE|
| '71189'| INF ARTHRITIS NEC-MULT    |
| '71190'| INF ARTHRITIS NOS-UNSPEC  |
| '71191'| INF ARTHRITIS NOS-SHilder |
| '71192'| INF ARTHRITIS NOS-UP/ARM  |
| '71193'| INF ARTHRITIS NOS-FOREARM |
| '71194'| INF ARTHRIT NOS-HAND      |
| '71195'| INF ARTHRIT NOS-PELVIS    |
| '71196'| INF ARTHRIT NOS-L/LEG     |
| '71197'| INF ARTHRIT NOS-ANKLE     |
| '71198'| INF ARTHRIT NOS-OTH SITE  |
| '71199'| INF ARTHRIT NOS-MULT      |
| '73000'| AC OSTEOMYELITIS-UNSPEC  |
| '73001'| AC OSTEOMYELITIS-SHilder |
| '73002'| AC OSTEOMYELITIS-UP/ARM  |
| '73003'| AC OSTEOMYELITIS-FOREARM |
| '73004'| AC OSTEOMYELITIS-HAND     |
| '73005'| AC OSTEOMYELITIS-PELVIS  |
| '73006'| AC OSTEOMYELITIS-L/LEG    |
| '73007'| AC OSTEOMYELITIS-ANKLE   |
| '73008'| AC OSTEOMYELITIS NEC      |
| '73009'| AC OSTEOMYELITIS-MULT     |
| '73010'| CHR OSTEOMYELITIS-UNSP    |
| '73011'| CHR OSTEOMYELIT-SHilder   |
| '73012'| CHR OSTEOMYELIT-UP/ARM    |
| '73013'| CHR OSTEOMYELIT-FOREARM   |
| '73014'| CHR OSTEOMYELIT-HAND      |
| '73015'| CHR OSTEOMYELIT-PELVIS    |
| '73016'| CHR OSTEOMYELIT-L/LEG     |
| '73017'| CHR OSTEOMYELIT-ANKLE     |
| '73018'| CHR OSTEOMYELIT NEC       |
| '73019'| CHR OSTEOMYELIT-MULT      |
| '73020'| OSTEOMYELITIS NOS-UNSPEC  |

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| Code | Description                  |
|------|------------------------------|
| '73021' | OSTEOMYELITIS NOS-SHLDER     |
| '73022' | OSTEOMYELITIS NOS-UP/ARM     |
| '73023' | OSTEOMYELIT NOS-FOREARM      |
| '73024' | OSTEOMYELITIS NOS-HAND       |
| '73025' | OSTEOMYELITIS NOS-PELVIS     |
| '73026' | OSTEOMYELITIS NOS-L/LEG      |
| '73027' | OSTEOMYELITIS NOS-ANKLE      |
| '73028' | OSTEOMYELIT NOS-OTH SITE     |
| '73029' | OSTEOMYELITIS NOS-MULT       |
| '73030' | PERIOSTITIS-UNSPEC           |
| '73031' | PERIOSTITIS-SHLDER           |
| '73032' | PERIOSTITIS-UP/ARM           |
| '73033' | PERIOSTITIS-FOREARM          |
| '73034' | PERIOSTITIS-HAND             |
| '73035' | PERIOSTITIS-PELVIS           |
| '73036' | PERIOSTITIS-L/LEG            |
| '73037' | PERIOSTITIS-ANKLE            |
| '73038' | PERIOSTITIS NEC              |
| '73039' | PERIOSTITIS-MULT             |
| '73040' | BONE INFECT NEC-UNSPEC       |
| '73041' | BONE INFECT NEC-SHLDER       |
| '73042' | BONE INFECT NEC-UP/ARM       |
| '73043' | BONE INFECT NEC-FOREARM      |
| '73044' | BONE INFECT NEC-HAND         |
| '73045' | BONE INFECT NEC-PELVIS       |
| '73046' | BONE INFECT NEC-L/LEG        |
| '73047' | BONE INFECT NEC-ANKLE        |
| '73048' | BONE INFECT NEC-OTH SITE     |
| '73049' | BONE INFECT NEC-MULT         |
| '73050' | BONE INFECT NOS-UNSP SITE    |
| '73051' | BONE INFECT NOS-SHLDER       |
| '73052' | BONE INFECT NOS-UP/ARM       |
| '73053' | BONE INFECT NOS-FOREARM      |
| '73054' | BONE INFECT NOS-HAND         |
| '73055' | BONE INFECT NOS-PELVIS       |
| '73056' | BONE INFECT NOS-L/LEG        |
| '73057' | BONE INFECT NOS-ANKLE        |
| '73058' | BONE INFECT NOS-OTH SITE     |
| '73059' | BONE INFECT NOS-MULT         |
| '99666' | REACT-INTER JOINT PROST (Begin 1989) |
| '99667' | REACT-OTH INT ORTHO DEV (Begin 1989) |
## B. Central Nervous System

| ICD-9-CM CODE | DESCRIPTION                              |
|---------------|------------------------------------------|
| '09181'       | ACUTE SYPHIL MENINGITIS                  |
| '0941'        | GENERAL PARESIS                          |
| '09481'       | SYPHILITIC ENCEPHALITIS                  |
| '09489'       | NEUROSYPHILIS NEC                        |
| '0949'        | NEUROSYPHILIS NOS                        |
| '09882'       | GONOCOCCAL MENINGITIS                    |
| '00321'       | SALMONELLA MENINGITIS                    |
| '0360'        | MENINGOCOCCAL MENINGITIS                 |
| '0470'        | COXSACKIE VIRUS MENING                    |
| '0471'        | ECHO VIRUS MENINGITIS                    |
| '0478'        | VIRAL MENINGITIS NEC                     |
| '0479'        | VIRAL MENINGITIS NOS                     |
| '0490'        | LYMPHOCYTIC CHORIOMENING                 |
| '0491'        | ADENOVIRAL MENINGITIS                    |
| '0530'        | HERPES ZOSTER MENINGIT                   |
| '05472'       | H SIMPLEX MENINGITIS                     |
| '0721'        | MUMPS MENINGITIS                         |
| '10081'       | LEPTOSPIRAL MENINGITIS                   |
| '11283'       | CANDIDAL MENINGITIS                      |
| '1142'        | COCCIDIOIDAL MENINGIT                    |
| '11501'       | HISTOPLASM CAPSUL MENING                 |
| '11511'       | HISTOPLASM DUBOIS MENING                 |
| '11591'       | HISTOPLASMOSIS MENINGIT                  |
| '3200'        | HEMOPHILUS MENINGIT                      |
| '3201'        | PNEUMOCOCCAL MENINGIT                    |
| '3202'        | STREPTOCOCCAL MENINGIT                   |
| '3203'        | STAPHYLOCOCC MENINGIT                    |
| '3207'        | MENING IN OTH BACT DIS                   |
| '3208'        | BACTERIAL MENINGITIS NEC (Begin 1980, End 1992) |
| '32081'       | ANAEROBIC MENINGITIS (Begin 1992)        |
| '32082'       | GRAM NEG MENINGITIS NEC (Begin 1992)     |
| '32089'       | OTH BACTER MENINGITIS (Begin 1992)       |
| '3209'        | BACTERIAL MENINGITIS NOS                 |
| '3210'        | CRYPTOCOCCAL MENINGIT                    |
| '3211'        | MENING IN OTH FUNGAL DIS                 |
| '3212'        | MENING IN OTH VIRAL DIS                  |
| '3213'        | TRYPANOSOMIASIS MENINGIT                 |
| '3214'        | MENINGIT D/T SARCOIDOSIS                 |
| Code   | Description                                      |
|--------|--------------------------------------------------|
| '3218' | MENING IN OTH NONBAC DIS                         |
| '3220' | NONPYOGENIC MENINGITIS                          |
| '3221' | EOSINOPHILIC MENINGITIS                         |
| '3222' | CHRONIC MENINGITIS                              |
| '3229' | MENINGITIS NOS                                  |
| '0361' | MENINGOCOCC ENCEPHALITIS                       |
| '0462' | SUBAC SCLEROS PANENCEPH                         |
| '0498' | VIRAL ENCEPHALITIS NEC                         |
| '0499' | VIRAL ENCEPHALITIS NOS                         |
| '0520' | POSTVARICELLA ENCEPHALIT                       |
| '0543' | HERPETIC ENCEPHALITIS                          |
| '0550' | POSTMEASLES ENCEPHALITIS                       |
| '0560' | RUBELLA ENCEPHALITIS                           |
| '0582' | HUMAN HERPESVIR 6 ENCEPH (Begin 2007)           |
| '05829'| HUMAN HERPESVR ENCPH NEC (Begin 2007)           |
| '0620' | JAPANESE ENCEPHALITIS                          |
| '0621' | WEST EQUINE ENCEPHALITIS                       |
| '0622' | EAST EQUINE ENCEPHALITIS                       |
| '0623' | ST LOUIS ENCEPHALITIS                          |
| '0624' | AUSTRALIAN ENCEPHALITIS                        |
| '0625' | CALIFORNIA ENCEPHALITIS                        |
| '0628' | MOSQUIT-BORNE ENCEPH NEC                        |
| '0629' | MOSQUIT-BORNE ENCEPH NOS                        |
| '0630' | RUSSIA SPR-SUMMER ENCEPH                        |
| '0631' | LOUPING ILL                                    |
| '0632' | CENT EUROPE ENCEPHALITIS                       |
| '0638' | TICK-BORNE ENCEPH NEC                          |
| '0639' | TICK-BORNE ENCEPH NOS                          |
| '064'  | VIR ENCEPH ARTHROPOD NEC                        |
| '0662' | VENEZUELAN EQUINE FEVER                        |
| '0722' | MUMPS ENCEPHALITIS                             |
| '1300' | TOXOPLASM MENINGENCEPH                         |
| '1390' | LATE EFF VIRAL ENCEPHAL                        |
| '3230' | ENCEPHALIT IN VIRAL DIS                        |
| '32301'| ENCEPH/ENCEPHMYE OTH DIS (Begin 2006)          |
| '32302'| MYELITIS-OTH VIRAL DIS (Begin 2006)            |
| '3231' | RICKETTSIAL ENCEPHALITIS                       |
| '3232' | PROTOZOAL ENCEPHALITIS                         |
| '3234' | OTH ENCEPHALIT D/T INFEC                       |
| '32341'| ENCEPH/MYELITIS-OTH INF (Begin 2006)           |
| '32342'| MYELITIS D/T OTH INFECT (Begin 2006)           |
| '32351'| ENCEPH/MYEL FOLWG IMMUNE (Begin 2006)          |
| '32352'| MYELITIS FOLLWG IMMUNE (Begin 2006)            |
### C. Genitourinary

| ICD-9-CM Code | Description                          |
|---------------|--------------------------------------|
| '1122'        | CANDIDIAS UROGENITAL NEC             |
| '0910'        | PRIMARY GENITAL SYPHILIS             |
| '0911'        | PRIMARY ANAL SYPHILIS                |
| '0912'        | PRIMARY SYPHILIS NEC                 |
| '0954'        | SYPHILIS OF KIDNEY                   |
| '0980'        | ACUTE GC INFECT LOWER GU             |
| '09810'       | GC (ACUTE) UPPER GU NOS              |
| '09811'       | GC CYSTITIS (ACUTE)                  |
| '09812'       | GC PROSTATITIS (ACUTE)               |
| '09813'       | GC ORCHITIS (ACUTE)                  |
| '09814'       | GC SEM VESICULIT (ACUTE)             |
| '09819'       | GC (ACUTE) UPPER GU NEC              |
| '0982'        | CHR GC INFECT LOWER GU               |
| '09830'       | CHR GC UPPER GU NOS                  |
| '09831'       | GC CYSTITIS-CHRONIC                  |
| '09832'       | GC PROSTATITIS-CHRONIC               |
| '09833'       | GC ORCHITIS-CHRONIC                  |
| '09834'       | GC SEM VESICULITIS-CHR               |
| '09839'       | CHR GC UPPER GU NEC                  |
| '0987'        | GC INFECT ANUS & RECTUM              |
| '0990'        | CHANCROID                            |
| '0991'        | LYMPHOCYTOSIS VENEREUM               |

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| Code   | Description                                      |
|--------|--------------------------------------------------|
| '0992 '| GRANULOMA INGUINALE                             |
| '0994 '| NONGONOCOCC URETHRIT NEC (Begin 1980, End 1992)   |
| '09940'| UNSPEC URETHRITIS (Begin 1992)                   |
| '09941'| CHLAMYDIA URETHRITIS (Begin 1992)                |
| '09949'| NONGONOCOCC URETHRIT NEC (Begin 1992)            |
| '09952'| CHLAMYDIA-ANUS RECTUM (Begin 1992)               |
| '09953'| CHLAMYDIA-LOWER GU (Begin 1992)                  |
| '09954'| CHLAMYDIA-OTHER GU (Begin 1992)                  |
| '09955'| CHLAMYDIA-UNSPEC GU (Begin 1992)                 |
| '0998 '| VENEREAL DISEASE NEC                             |
| '0999 '| VENEREAL DISEASE NOS                             |
| '03284'| DIPHTHERITIC CYSTITIS                           |
| '59000'| CHR PYELONEPHRITIS NOS                           |
| '59001'| CHR PYELONEPH W MED NECR                        |
| '5901 '| ACUTE PYELONEPHRITIS                            |
| '59010'| AC PYELONEPHRITIS NOS                           |
| '59011'| AC PYELONEPHR W MED NECR                        |
| '5902 '| RENAL/PERIRENAL ABSCESS                          |
| '5903 '| PYLoureteritis CYSTICA                           |
| '59080'| PYELONEPHRITIS NOS                              |
| '59081'| PYELONEPHRIT IN OTH DIS                         |
| '5909 '| INFECTION OF KIDNEY NOS                          |
| '5950 '| ACUTE CYSTITIS                                   |
| '5951 '| CHR INTERSTIT CYSTITIS                           |
| '5952 '| CHRONIC CYSTITIS NEC                             |
| '5953 '| TRIGONITIS                                       |
| '5954 '| CYSTITIS IN OTH DIS                              |
| '59581'| CYSTITIS CYSTICA                                |
| '59589'| CYSTITIS NEC                                     |
| '5959 '| CYSTITIS NOS                                     |
| '5970 '| URETHRAL ABSCESS                                 |
| '59780'| URETHRITIS NOS                                   |
| '59781'| URETHRAL SYNDROME NOS                            |
| '59789'| URETHRITIS NEC                                   |
| '5990 '| URIN TRACT INFECTION NOS                         |
| '6010 '| ACUTE PROSTATITIS                                |
| '6011 '| CHRONIC PROSTATITIS                              |
| '6012 '| ABSCESS OF PROSTATE                              |
| '6013 '| PROSTATOCYSTITIS                                 |
| '6014 '| PROSTATITIS IN OTH DIS                           |
| '6018 '| PROSTATIC INFLAM DIS NEC                         |
| '6019 '| PROSTATITIS NOS                                   |
| '6031 '| INFECTED HYDROCELE                               |

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| ICD-9-CM CODE | DESCRIPTION                                                      |
|--------------|------------------------------------------------------------------|
| '11285'      | CANDIDAL ENTERITIS (Begin 1992)                                   |
| '0952'       | SYPHILITIC PERITONITIS                                          |
| '0953'       | SYPHILIS OF LIVER                                                |
| '09886'      | GONOCOCCAL PERITONITIS                                          |
| '09956'      | CHLAMYDIA-PERITONEUM (Begin 1992)                               |
| '0010'       | CHOLERA D/T VIB CHOLERAE                                         |
| '0011'       | CHOLERA D/T VIB EL TOR                                           |
| '0019'       | CHOLERA NOS                                                      |
| '0020'       | TYPHOID FEVER                                                    |
| '0021'       | PARATYPHOID FEVER A                                              |
| '0022'       | PARATYPHOID FEVER B                                              |
| '0023'       | PARATYPHOID FEVER C                                              |
| '0029'       | PARATYPHOID FEVER NOS                                            |
| '0030'       | SALMONELLA ENTERITIS                                             |
| '00320'      | LOCAL SALMONELLA INF NOS                                         |
| '00329'      | LOCAL SALMONELLA INF NEC                                         |
| '0038'       | SALMONELLA INFECTION NEC                                         |
| '0039'       | SALMONELLA INFECTION NOS                                         |
| '0040'       | SHIGELLA DYSENTERIAE                                             |
| '0041'       | SHIGELLA FLEXNERI                                                |
| '0042'       | SHIGELLA BOYDII                                                  |
| '0043'       | SHIGELLA SONNEI                                                  |
| '0048'       | SHIGELLA INFECTION NEC                                           |
| '0049'       | SHIGELLOSIS NOS                                                  |
| '0050'       | STAPH FOOD POISONING                                             |
| '0051'       | BOTULISM                                                         |
| '0052'       | FOOD POIS D/T C. PERFRIN                                          |

**D. Intra-Abdominal**

| ICD-9-CM CODE | DESCRIPTION                                                      |
|--------------|------------------------------------------------------------------|
| '6040'       | ORCHITIS WITH ABSCESS                                            |
| '60490'      | ORCHITIS/EPIDIDYMIT NOS                                          |
| '60491'      | ORCHITIS IN OTH DISEASE                                          |
| '60499'      | ORCHITIS/EPIDIDYMIT NEC                                          |
| '6071'       | BALANOPOSTHITIS                                                  |
| '6072'       | INFLAM DIS- PENIS NEC                                            |
| '6080'       | SEMINAL VESICULITIS                                              |
| '6084'       | MALE GEN INFLAM DIS NEC                                          |
| '99664'      | REACT-INDWELL URIN CATH (Begin 1989)                             |
| '99665'      | REACT-OTH GENITOURIN DEV (Begin 1989)                            |

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| Code   | Description                                           |
|--------|-------------------------------------------------------|
| '0053' | FOOD POIS: CLOSTRID NEC                              |
| '0054' | FOOD POIS: V. PARAHAE M                               |
| '0058' | BACT FOOD POISONING NEC (End 1995)                    |
| '00581'| FOOD POISONING VIBRIO (Begin 1995)                    |
| '00589'| OTH BACT FOOD POISONING (Begin 1995)                  |
| '0059' | FOOD POISONING NOS                                    |
| '0060' | AC AMEBIASIS W/O ABSCESS                              |
| '0061' | CHR AMEBIASIS W/O ABSCES                              |
| '0062' | AMEBIC NONDYSENT COLITIS                              |
| '0063' | AMEBIC LIVER ABSCESS                                  |
| '0064' | AMEBIC LUNG ABSCESS                                   |
| '0065' | AMEBIC BRAIN ABSCESS                                  |
| '0066' | AMEBIC SKIN ULCERATION                                |
| '0068' | AMEBIC INFECTION NEC                                  |
| '0069' | AMEBIASIS NOS                                         |
| '0070' | BALANTIDIASIS                                         |
| '0071' | GIARDIASIS                                            |
| '0072' | COCCIDIOSIS                                           |
| '0073' | INTEST TRICHIOMONIASIS                                |
| '0074' | OT PROTOZ INTEST DX- CRYP (Begin 1997)                |
| '0075' | CYCLOSPORIASIS (Begin 2000)                           |
| '0078' | PROTOZOAL INTEST DIS NEC                              |
| '0079' | PROTOZOAL INTEST DIS NOS                              |
| '0080' | E. COLI ENTERITIS (Begin 1980, End 1992)              |
| '00800'| E. COLI ENTERITIS-NOS (Begin 1992)                    |
| '00801'| E. COLI ENTERITIS-PATH (Begin 1992)                   |
| '00802'| E. COLI ENTERITIS-TOX (Begin 1992)                    |
| '00803'| E. COLI ENTERITIS-INVAS (Begin 1992)                  |
| '00804'| E. COLI ENTERITIS-HEMOR (Begin 1992)                  |
| '00809'| E. COLI ENTERITIS-OTHER (Begin 1992)                  |
| '0081' | ARIZONA ENTERITIS                                     |
| '0082' | AEROBACTER ENTERITIS                                  |
| '0083' | PROTEUS ENTERITIS                                     |
| '00841'| STAPHYLOCCOC ENTERITIS                                |
| '00842'| PSEU DOMONAS ENTERITIS                                |
| '00843'| CAMPYLOBACTER (Begin 1992)                            |
| '00844'| YERSINIA (Begin 1992)                                 |
| '00845'| CLOSTRIDIUM DIF (Begin 1992)                          |
| '00846'| OTHER ANAEROBES (Begin 1992)                          |
| '00847'| OTH GRAM NEG BACT (Begin 1992)                        |
| '00849'| BACTERIAL ENTERITIS NEC                               |
| '0085' | BACTERIAL ENTERITIS NOS                               |
| '0086' | VIRAL ENTERITIS NEC (Begin 1980, End 1992)            |
| Code    | Description                                      |
|---------|--------------------------------------------------|
| '00861' | ROTAVIRUS ENTERITIS (Begin 1992)                 |
| '00862' | ADENOVIR ENTERITIS (Begin 1992)                 |
| '00863' | NORWALK VIR ENTERITIS (Begin 1992)              |
| '00864' | SML ROUND VIR ENTERITIS (Begin 1992)            |
| '00865' | CALCIVIRUS ENTERITIS (Begin 1992)               |
| '00866' | ASTROVIRUS ENTERITIS (Begin 1992)               |
| '00867' | ENTERITIS NEC (Begin 1992)                      |
| '00869' | ENTERITIS NOS (Begin 1992)                      |
| '0088'  | VIRAL ENTERITIS NOS                             |
| '0090'  | INFECTIOUS ENTERITIS NOS                        |
| '0091'  | ENTERITIS OF INFECT ORIG                        |
| '0092'  | INFECTIOUS DIARRHEA NOS                         |
| '0093'  | DIARRHEA OF INFECT ORIG                         |
| '0211'  | ENTERIC TULAREMIA                                |
| '0222'  | GASTROINTESTINAL ANTHRAX                        |
| '5400'  | AC APPEND W PERITONITIS                         |
| '5401'  | ABSCESS OF APPENDIX                             |
| '5409'  | ACUTE APPENDICITIS NOS                          |
| '541'   | APPENDICITIS NOS                                |
| '542'   | OTHER APPENDICITIS                              |
| '55000' | UNILAT ING HERNIA W GANG                        |
| '55001' | RECUR UNIL ING HERN-GANG                        |
| '55002' | BILAT ING HERNIA W GANG                         |
| '55003' | RECUR BIL ING HERN-GANG                         |
| '55100' | UNIL FEMORAL HERN W GANG                         |
| '55101' | REC UNIL FEM HERN W GANG                         |
| '55102' | BILAT FEM HERN W GANG                            |
| '55103' | RECUR BIL FEM HERN-GANG                         |
| '5511'  | UMBILICAL HERNIA W GANGR                         |
| '55120' | GANGR VENTRAL HERNIA NOS                        |
| '55121' | GANGR INCISIONAL HERNIA                         |
| '55129' | GANV VENTRAL HERNIA NEC                         |
| '5513'  | DIAPHRAGM HERNIA W GANGR                        |
| '5518'  | HERNIA- SITE NEC W GANGR                        |
| '5519'  | HERNIA- SITE NOS W GANGR                        |
| '56201' | DVRTCLI SML INT (W/O HMRRG) (Begin 1980)        |
| '56203' | DVRTCLI SML INT W HMRRHG (Begin 1991)            |
| '56211' | DVRTCLI COLON (W/O HMRRHG) (Begin 1980)         |
| '56213' | DVRTCLI COLON W HMRRHG (Begin 1991)             |
| '566'   | ANAL & RECTAL ABSCESS                           |
| '03283' | DIPHTHERITIC PERITONITIS                        |
| '5670'  | PERITONITIS IN INFEC DIS                        |
| '5671'  | PNEUMOCOCCAL PERITONITIS                        |

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| Code  | Description                                      |
|-------|--------------------------------------------------|
| '5672' | SUPPURAT PERITONITIS NEC (End 2005)              |
| '56721'| PERITONITIS (ACUTE) GEN (Begin 2005)            |
| '56722'| PERITONEAL ABSCESS (Begin 2005)                 |
| '56723'| SPONAT BACT PERITONITIS (Begin 2005)            |
| '56729'| SUPPURAT PERITONITIS NEC (Begin 2005)           |
| '56738'| RETROPERITON ABSCESS NEC (Begin 2005)           |
| '56739'| RETROPERITON INFECT NEC (Begin 2005)            |
| '5678' | PERITONITIS NEC (End 2005)                       |
| '56781'| CHOLEPERITONITIS (Begin 2005)                   |
| '56789'| PERITONITIS NEC (Begin 2005)                    |
| '5679' | PERITONITIS NOS                                 |
| '5695' | INTESTINAL ABSCESS                              |
| '57400'| CHOLELITH W AC CHOLECYST                        |
| '57401'| CHOLELITH/AC GB INF-OBST                        |
| '57410'| CHOLELITH W CHOLECYS NEC                        |
| '57411'| CHOLELITH/GB INF NEC-OBS                        |
| '57421'| CHOLELITHIAS NOS W OBSTR                        |
| '57430'| CHOLEDOCHOLITH/AC GB INF                        |
| '57431'| CHOLEDOCHLITH/AC GB-OBST                       |
| '57440'| CHOLEDOCHLITH/GB INF NEC                        |
| '57441'| CHOLEDOCHLITH/GB NEC-OBS                        |
| '57451'| CHOLEDOCHLITH NOS W OBST                        |
| '57460'| CHOLELITH W/ AC W/O OBS (Begin 1996)            |
| '57461'| CHOLELITH W/ AC W/ OBS (Begin 1996)             |
| '57470'| CHOLELITH W/ OT W/O OBS (Begin 1996)            |
| '57471'| CHOLELITH W/ OT W/ OBS (Begin 1996)             |
| '57480'| CHOLELIT AC/CHR W/O OBS (Begin 1996)            |
| '57481'| CHOLELIT AC/CHR W/ OBS (Begin 1996)             |
| '5750' | ACUTE CHOLECYSTITIS                             |
| '5751' | CHOLECYSTITIS NEC (End 1996)                    |
| '57510'| CHOLECYSTITIS NOS (Begin 1996)                  |
| '57511'| CHRON CHOLECYSTITIS (Begin 1996)               |
| '57512'| AC/CHR CHOLECYSTITIS (Begin 1996)              |
| '5752' | OBSTRUCTION GALLBLADDER                         |
| '5754' | PERFORATION GALLBLADDER                         |
| '5755' | FISTULA OF GALLBLADDER                          |
| '5761' | CHOLANGITIS                                     |
| '5762' | OBSTRUCTION OF BILE DUCT                        |
| '5763' | PERFORATION OF BILE DUCT                        |
| '5764' | FISTULA OF BILE DUCT                            |
| '5720' | ABSCESS OF LIVER                                |
| '5721' | PORTAL PYEMIA                                   |
| '56983' | PERFORATION OF INTESTINE                        |
### Obstetric/Gynecologic

| ICD-9-CM CODE | DESCRIPTION |
|---------------|-------------|
| '09815'       | GC CERVICITIS (ACUTE) |
| '09816'       | GC ENDOMETRITIS (ACUTE) |
| '09817'       | ACUTE GC SALPINGITIS |
| '09835'       | GC CERVICITIS-CHRONIC |
| '09836'       | GC ENDOMETRITIS-CHRONIC |
| '09837'       | GC SALPINGITIS (CHRONIC) |
| '6140'        | AC SALPINGO-OOPHORITIS |
| '6141'        | CHR SALPINGO-OOPHORITIS |
| '6142'        | SALPINGO-OOPHORITIS NOS |
| '6143'        | ACUTE PARAMETRITIS |
| '6144'        | CHRONIC PARAMETRITIS |
| '6145'        | AC PELV PERITONITIS-FEM |
| '6146'        | FEM PELVIC PERITON ADHES |
| '6147'        | CHR PELV PERITON NEC-FEM |
| '6148'        | FEM PELV INFLAM DIS NEC |
| '6149'        | FEM PELV INFLAM DIS NOS |
| '6150'        | AC UTERINE INFLAMMATION |
| '6151'        | CHR UTERINE INFLAMMATION |
| '6159'        | UTERINE INFLAM DIS NOS |
| '6160'        | CERVICITIS |
| '61610'       | VAGINITIS NOS |
| '61611'       | VAGINITIS IN OTH DISEASE |
| '6162'        | BARTHOLIN-s GLAND CYST |
| '6163'        | BARTHOLIN-s GLND ABSCESS |
| '6164'        | ABSCESS OF VULVA NEC |
| '61650'       | ULCERATION OF VULVA NOS |
| '61651'       | VULVAR ULCER IN OTH DIS |
| '6168'        | FEMALE GEN INFLAM NEC |
| '61681'       | MUCOSITIS CERV |
| '61689'       | INFLM CERV |
| '6169'        | FEMALE GEN INFLAM NOS |
| '63700'       | ABORT NOS W PEL INF-UNSP |
| '63701'       | ABORT NOS W PEL INF-INC |
| '63702'       | ABORT NOS W PEL INF-COMP |
| '6380'        | ATTEM ABORT W PELVIC INF |
| '6390'        | POSTABORTION GU INFECT |
| '64660'       | GU INFECT IN PREG-UNSPEC |
| '64661'       | GU INFECTION-DELIVERED |
| Code     | Description                                      |
|----------|--------------------------------------------------|
| '64662'  | GU INFECTION-DELIV W P/P                        |
| '64663'  | GU INFECTION-ANTEPARTUM                        |
| '64664'  | GU INFECTION-POSTPARTUM                        |
| '64700'  | SYphilis in preg-unspec                        |
| '64701'  | SYphilis-delivered                             |
| '64702'  | SYphilis-delivered w p/p                       |
| '64703'  | SYphilis-antepartum                            |
| '64704'  | SYphilis-postpartum                            |
| '64710'  | Gonorrhea in preg-unspec                       |
| '64711'  | Gonorrhea-delivered                            |
| '64712'  | Gonorrhea-deliver w p/p                        |
| '64713'  | Gonorrhea-antepartum                           |
| '64714'  | Gonorrhea-postpartum                           |
| '64720'  | Other v.d in preg-unspec                       |
| '64721'  | Other v.d-delivered                            |
| '64722'  | Other v.d-deliver w p/p                        |
| '64723'  | Other v.d-antepartum                           |
| '64724'  | Other v.d-postpartum                           |
| '64730'  | TB in preg-unspecified                         |
| '64731'  | Tuberculosis-delivered                         |
| '64732'  | Tuberculosis-deliv w p/p                       |
| '64733'  | Tuberculosis-antepartum                        |
| '64734'  | Tuberculosis-postpartum                        |
| '64740'  | Malaria in preg-unspec                         |
| '64741'  | Malaria-delivered                              |
| '64742'  | Malaria-deliver w p/p                          |
| '64743'  | Malaria-antepartum                             |
| '64744'  | Malaria-postpartum                             |
| '64781'  | Infect dis nec-delivered                       |
| '64782'  | Infect dis nec-deliver w p/p                   |
| '64783'  | Infect dis nec-antepartum                      |
| '64784'  | Infect dis nec-postpart                        |
| '64790'  | Infect in preg nos-unspec                      |
| '64791'  | Infect nos-delivered                           |
| '64792'  | Infect nos-deliver w p/p                       |
| '64793'  | Infect nos-antepartum                          |
| '64794'  | Infect nos-postpartum                          |
| '67000'  | Major puerp infect-unspec (begin 1991)          |
| '67002'  | Major puerp inf-del p/p (begin 1991)            |
| '67004'  | Major puerp inf-postpart (begin 1991)           |
| '67330'  | Ob pyemic embol-unspec                         |
| '67331'  | Ob pyemic embol-deliver                        |
| '67332'  | Ob pyem embol-deliver w p/p                    |

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| ICD-9-CM CODE | DESCRIPTION                      |
|--------------|----------------------------------|
| 0951         | SYPHILIS OF LUNG                 |
| 00322        | SALMONELLA PNEUMONIA             |
| 0203         | PRIMARY PNEUMONIC PLAGUE         |
| 0204         | SECONDARY PNEUMONIC PLAGUE       |
| 0205         | PNEUMONIC PLAGUE NOS             |
| 0212         | PULMONARY TULAREMIA              |
| 0221         | PULMONARY ANTHRAX                |
| 0310         | PULMONARY MYCOBACTERIA           |
| 0391         | PULMONARY ACTINOMYCOsis          |
| 0521         | VARICELLA PNEUMONITIS           |
| 0551         | POSTMEASLES PNEUMONIA            |
| 0730         | ORNITHOSIS PNEUMONIA            |

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| Code   | Description                                      |
|--------|--------------------------------------------------|
| '0830' | Q FEVER                                          |
| '1124' | CANDIDIASIS OF LUNG                              |
| '1140' | PRIMARY COCCIDIOIDOMYCOS                         |
| '1144' | CHRONIC PULMON COCCIDIOIDOMYCOSIS (Begin 1993)  |
| '1145' | UNSPEC PULMON COCCIDIOIDOMYCOSIS (Begin 1993)   |
| '11505'| HISTOPLASM CAPS PNEUMON                        |
| '11515'| HISTOPLASM DUB PNEUMONIA                        |
| '11595'| HISTOPLASMOSIS PNEUMONIA                       |
| '1304' | TOXOPLASMA PNEUMONITIS                          |
| '1363' | PNEUMOCYSTOSIS                                  |
| '4800' | ADENOVIRAL PNEUMONIA                            |
| '4801' | RESP SYNCYT VIRAL PNEUM                          |
| '4802' | PARINFLUENZA VIRAL PNEUM                         |
| '4803' | PNEUMONIA DUE TO SARS-ASSOCIATED CORONAVIRUS (Begin 2003) |
| '4808' | VIRAL PNEUMONIA NEC                             |
| '4809' | VIRAL PNEUMONIA NOS                             |
| '481'  | PNEUMOCOCCAL PNEUMONIA                          |
| '482'  | OTHER BACTERIAL PNEUMONIA                       |
| '4820' | K. PNEUMONIAE PNEUMONIA                        |
| '4821' | PSEUDOMONAL PNEUMONIA                          |
| '4822' | H. INFLUENZAE PNEUMONIA                        |
| '4823' | STREPTOCOCCAL PNEUMONIA (Begin 1980, End 1992) |
| '48230'| STREP PNEUMONIA UNSPEC (Begin 1992)             |
| '48231'| GRP A STREP PNEUMONIA (Begin 1992)              |
| '48232'| GRP B STREP PNEUMONIA (Begin 1992)              |
| '48239'| OTH STREP PNEUMONIA (Begin 1992)                |
| '4824' | STAPHYLOCOCCAL PNEUMONIA (End 1998)             |
| '48240'| STAPH PNEUMONIA UNSP (Begin 1998)               |
| '48241'| STAPH AUREUS PNEUMON (Begin 1998)               |
| '48249'| STAPH PNEUMON OTH (Begin 1998)                  |
| '4828' | BACTERIAL PNEUMONIA NEC (Begin 1980, End 1992)  |
| '48281'| ANAEROBIC PNEUMONIA (Begin 1992)                |
| '48282'| E COLI PNEUMONIA (Begin 1992)                   |
| '48283'| OTH GRAM NEG PNEUMONIA (Begin 1992)             |
| '48284'| LEGIONNAIRES DX (Begin 1997)                    |
| '48289'| BACT PNEUMONIA NEC (Begin 1992)                 |
| '4829' | BACTERIAL PNEUMONIA NOS                         |
| '483'  | PNEUMONIA: ORGANISM NEC (Begin 1980, End 1992)  |
| '4830' | MYCOPLASMA PNEUMONIA (Begin 1992)               |
| '4831' | CHLAMYDIA PNEUMONIA (Begin 1996)                |
| '4838' | OTH SPEC ORG PNEUMONIA (Begin 1992)             |
| '4841' | PNEUM W CYTOMEG INCL DIS                        |
| '4843' | PNEUMONIA IN WHOOP COUGH                        |
| Code  | Description                           |
|-------|---------------------------------------|
| 4845  | PNEUMONIA IN ANTHRAX                  |
| 4846  | PNEUM IN ASPERGILLOSIS                |
| 4847  | PNEUM IN OTH SYS MYCOSES              |
| 4848  | PNEUM IN INFECT DIS NEC               |
| 485   | BRONCOPNEUMONIA ORG NOS               |
| 486   | PNEUMONIA- ORGANISM NOS               |
| 5130  | ABSCESS OF LUNG                       |
| 5171  | RHEUMATIC PNEUMONIA                   |
| 4870  | INFLUENZA WITH PNEUMONIA              |
| 4871  | FLU W RESP MANIFEST NEC                |
| 4878  | FLU W MANIFESTATION NEC                |
| 488   | FLU D/T AVIAN FLU VIRUS (Begin 2007)  |
| 463   | ACUTE TONSILLITIS                     |
| 4740  | CHRONIC TONSILLITIS (End 1997)        |
| 47400 | CHRON TONSILLITIS (Begin 1997)        |
| 47401 | CHRON ADENOIDITIS (Begin 1997)        |
| 47402 | CHRON TONSIL ADENOID (Begin 1997)     |
| 475   | PERITONSILLAR ABSCESS                 |
| 4660  | ACUTE BRONCHITIS                      |
| 4661  | ACUTE BRONCHIOLITIS (End 1996)        |
| 46611 | RSV BRONCHIOLITIS (Begin 1996)        |
| 46619 | OTH ACUTE BRONCHIOL (Begin 1996)      |
| 0320  | FAUCIAL DIPHTHERIA                    |
| 0321  | NASOPHARYNX DIPHTHERIA                |
| 0322  | ANT NASAL DIPHTHERIA                  |
| 0323  | LARYNGEAL DIPHTHERIA                  |
| 0340  | STREP SORE THROAT                     |
| 460   | ACUTE NASOPHARYNGITIS                 |
| 4610  | AC MAXILLARY SINUSITIS                |
| 4611  | AC FRONTAL SINUSITIS                 |
| 4612  | AC ETHMOIDAL SINUSITIS                |
| 4613  | AC SPHENOIDAL SINUSITIS               |
| 4618  | OTHER ACUTE SINUSITIS                 |
| 4619  | ACUTE SINUSITIS NOS                   |
| 462   | ACUTE PHARYNGITIS                     |
| 4640  | ACUTE LARYNGITIS (End 2001)           |
| 46400 | ACUTE LARYNGITIS- W/O OBSTR (Begin 2001) |
| 46401 | ACUTE LARYNGITIS- W OBSTR (Begin 2001) |
| 46410 | AC TRACHEITIS NO OBSTRUC              |
| 46411 | AC TRACHEITIS W OBSTRUCT              |
| 46420 | AC LARYNGOTRACH NO OBSTR              |
| 46421 | AC LARYNGOTRACH W OBSTR               |
| 46430 | AC EPIGLOTTITIS NO OBSTR              |
### G. Skin/Soft Tissue

| ICD-9-CM Code | Description                              |
|---------------|------------------------------------------|
| '0392'        | ABDOMINAL ACTINOMYCOSIS                  |
| '0393'        | CERVICOFAC ACTINOMYCOSIS                 |
| '0394'        | MADURA FOOT                              |
| '0400'        | GAS GANGRENE                             |
| '04042'       | WOUND BOTULISM (Begin 2007)              |
| '04081'       | TROPICAL PYOMYOSITIS                     |
| '1123'        | CUTANEOUS CANDIDIAS                      |
| '11282'       | CANDIDAL OTITIS EXTERNA                  |
| '1141'        | PRIM CUTAN COCCIDIOID                    |
| '0956'        | SYPHILIS OF MUSCLE                       |
| '0957'        | SYPHILIS OF TENDON/BURSA                 |
| '09851'       | GONOCOCCAL SYNOVITIS                     |
| '09852'       | GONOCOCCAL BURSITIS                      |
| Code   | Description                        |
|--------|------------------------------------|
| '38000' | PERICHONDritis PINNA NOS           |
| '38001' | AC PERICHONDritis PINNA            |
| '38002' | CHR PERICHONDritis PINNA           |
| '38003' | CHONDritis OF PINNA (Begin 2004)   |
| '38010' | INFEC OTITIS EXTERNA NOS           |
| '38011' | ACUTE INFECTION OF PINNA           |
| '38012' | ACUTE SWIMMERS EAR                 |
| '38013' | AC INFECT EXTERN EAR NEC           |
| '38014' | MALIGNANT OTITIS EXTERNA           |
| '38015' | CHR MYCOT OTITIS EXTERNA           |
| '38016' | CHR INF OTIT EXTERNA NEC           |
| '38022' | ACUTE OTITIS EXTERNA NEC           |
| '38023' | CHR OTITIS EXTERNA NEC             |
| '0201 ' | CELLULOCUTANEOUS PLAGUE            |
| '0210 ' | ULCEROGLANDUL TULAREMIA            |
| '0220 ' | CUTANEOUS ANTHRAX                  |
| '0311 ' | CUTANEOUS MYCOBACTERIA             |
| '03285'| CUTANEOUS DIPHTHERIA              |
| '035 ' | ERYSIPELAS                         |
| '0390 ' | CUTANEOUS ACTINOMYCOSIS            |
| '6800 ' | CARBUNCLE OF FACE                  |
| '6801 ' | CARBUNCLE OF NECK                  |
| '6802 ' | CARBUNCLE OF TRUNK                 |
| '6803 ' | CARBUNCLE OF ARM                   |
| '6804 ' | CARBUNCLE OF HAND                  |
| '6805 ' | CARBUNCLE OF BUTTOCK               |
| '6806 ' | CARBUNCLE OF LEG                   |
| '6807 ' | CARBUNCLE OF FOOT                  |
| '6808 ' | CARBUNCLE- SITE NEC                |
| '6809 ' | CARBUNCLE NOS                      |
| '68100'| CELLULITIS - FINGER NOS            |
| '68101'| FELON                              |
| '68102'| ONYCHIA OF FINGER                  |
| '68110'| CELLULITIS - TOE NOS               |
| '68111'| ONYCHIA OF TOE                     |
| '6819 ' | CELLULITIS OF DIGIT NOS            |
| '6820 ' | CELLULITIS OF FACE                 |
| '6821 ' | CELLULITIS OF NECK                 |
| '6822 ' | CELLULITIS OF TRUNK                |
| '6823 ' | CELLULITIS OF ARM                  |
| '6824 ' | CELLULITIS OF HAND                 |
| '6825 ' | CELLULITIS OF BUTTOCK              |
| '6826 ' | CELLULITIS OF LEG                  |
| ICD-9-CM Code | Description                     |
|--------------|--------------------------------|
| '6827'       | Cellulitis of Foot             |
| '6828'       | Cellulitis - Site NEC          |
| '6829'       | Cellulitis NOS                 |
| '684'        | Impetigo                       |
| '6850'       | Pilonidal Cyst W Abscess       |
| '6851'       | Pilonidal Cyst W/O Absc        |
| '6860'       | Pyoderma (End 1997)            |
| '68600'      | Pyoderma NOS (Begin 1997)      |
| '68601'      | Pyoderma Gangren (Begin 1997)  |
| '68609'      | Pyoderma NEC (Begin 1997)      |
| '6861'       | Pyogenic Granuloma             |
| '6868'       | Local Skin Infection NEC       |
| '6869'       | Local Skin Infection NOS       |
| '56731'      | Psoas Muscle Abscess (Begin 2005) |
| '7280'       | Infective Myositis             |
| '72886'      | Necrotizing Fasciitis (Begin 1995) |
| '99762'      | Infection Amputat Stump        |
| '7854'       | Gangrene                       |

### H. Other

| ICD-9-CM Code | Description                     |
|--------------|--------------------------------|
| '01000'      | Prim TB Complex-UNSPEC         |
| '01001'      | Prim TB Complex-NO EXAM        |
| '01002'      | Prim TB Complex-EXM UNKN       |
| '01003'      | Prim TB Complex-MICRO DX       |
| '01004'      | Prim TB Complex-CULT DX        |
| '01005'      | Prim TB Complex-HISTO DX       |
| '01006'      | Prim TB Complex-OTH TEST       |
| '01010'      | Prim TB Pleurisy-UNSPEC        |
| '01011'      | Prim TB Pleurisy-NO EXAM       |
| '01012'      | Prim TB Pleur-EXAM UNKN        |
| '01013'      | Prim TB Pleuris-MICRO DX       |
| '01014'      | Prim TB Pleurisy-CULT DX       |
| '01015'      | Prim TB Pleuris-HISTO DX       |
| '01016'      | Prim TB Pleuris-OTH TEST       |
| '01080'      | Prim Prog TB NEC-UNSPEC        |
| '01081'      | Prim Prog TB NEC-NO EXAM       |
| '01082'      | Prim Pr TB NEC-EXAM UNKN       |
| '01083'      | Prim Prog TB NEC-MICRO DX      |
| '01084'      | Prim Prog TB NEC-CULT DX       |
| '01085'      | Prim Prog TB NEC-HISTO DX      |
| '01086'      | Prim Prog TB NEC-OTH TEST      |
| '01090'      | Primary TB Nos-UNSPEC          |
| '01091'      | Primary TB Nos-NO EXAM         |
| Code   | Description                      |
|--------|----------------------------------|
| '01092' | PRIMARY TB NOS-EXAM UNKN         |
| '01093' | PRIMARY TB NOS-MICRO DX          |
| '01094' | PRIMARY TB NOS-CULT DX           |
| '01095' | PRIMARY TB NOS-HISTO DX          |
| '01096' | PRIMARY TB NOS-OTH TEST          |
| '01100' | TB LUNG INFILTR-UNSPEC           |
| '01101' | TB LUNG INFILTR-NO EXAM          |
| '01102' | TB LUNG INFILTR-EXM UNKN         |
| '01103' | TB LUNG INFILTR-MICRO DX         |
| '01104' | TB LUNG INFILTR-CULT DX          |
| '01105' | TB LUNG INFILTR-HISTO DX         |
| '01106' | TB LUNG INFILTR-OTH TEST         |
| '01110' | TB LUNG NODULAR-UNSPEC           |
| '01111' | TB LUNG NODULAR-NO EXAM          |
| '01112' | TB LUNG NODULAR-EXAM UNKN        |
| '01113' | TB LUNG NODULAR-MICRO DX         |
| '01114' | TB LUNG NODULAR-CULT DX          |
| '01115' | TB LUNG NODULAR-HISTO DX         |
| '01116' | TB LUNG NODULAR-OTH TEST         |
| '01120' | TB LUNG W CAVITY-UNSPEC          |
| '01121' | TB LUNG W CAVITY-NO EXAM         |
| '01122' | TB LUNG W CAVITY-EXAM UNKN       |
| '01123' | TB LUNG W CAVITY-MICRO DX        |
| '01124' | TB LUNG W CAVITY-CULT DX         |
| '01125' | TB LUNG W CAVITY-HISTO DX        |
| '01126' | TB LUNG W CAVITY-OTH TEST        |
| '01130' | TB OF BRONCHUS-UNSPEC            |
| '01131' | TB OF BRONCHUS-NO EXAM           |
| '01132' | TB OF BRONCHUS-EXAM UNKN         |
| '01133' | TB OF BRONCHUS-MICRO DX          |
| '01134' | TB OF BRONCHUS-CULT DX           |
| '01135' | TB OF BRONCHUS-HISTO DX          |
| '01136' | TB OF BRONCHUS-OTH TEST          |
| '01140' | TB LUNG FIBROSIS-UNSPEC          |
| '01141' | TB LUNG FIBROSIS-NO EXAM         |
| '01142' | TB LUNG FIBROS-EXAM UNKN         |
| '01143' | TB LUNG FIBROS-MICRO DX          |
| '01144' | TB LUNG FIBROSIS-CULT DX         |
| '01145' | TB LUNG FIBROS-HISTO DX          |
| '01146' | TB LUNG FIBROS-OTH TEST          |
| '01150' | TB BRONCHIECTASIS-UNSPEC         |
| '01151' | TB BRONCHIECT-NO EXAM            |
| '01152' | TB BRONCHIECT-EXAM UNKN          |
| Code   | Description                |
|--------|-----------------------------|
| '01214' | TB THORAX NODE-CULT DX      |
| '01215' | TB THORAX NODE-HISTO DX     |
| '01216' | TB THORAX NODE-OTH TEST     |
| '01220' | ISOL TRACHEAL TB-UNSPEC     |
| '01221' | ISOL TRACHEAL TB-NO EXAM    |
| '01222' | ISOL TRACH TB-EXAM UNKN     |
| '01223' | ISOLAT TRACH TB-MICRO DX    |
| '01224' | ISOL TRACHEAL TB-CULT DX    |
| '01225' | ISOLAT TRACH TB-HISTO DX    |
| '01226' | ISOLAT TRACH TB-OTH TEST    |
| '01230' | TB LARYNGITIS-UNSPEC       |
| '01231' | TB LARYNGITIS-NO EXAM       |
| '01232' | TB LARYNGITIS-EXAM UNKN     |
| '01233' | TB LARYNGITIS-MICRO DX      |
| '01234' | TB LARYNGITIS-CULT DX       |
| '01235' | TB LARYNGITIS-HISTO DX      |
| '01236' | TB LARYNGITIS-OTH TEST      |
| '01280' | RESP TB NEC-UNSPEC          |
| '01281' | RESP TB NEC-NO EXAM         |
| '01282' | RESP TB NEC-EXAM UNKN       |
| '01283' | RESP TB NEC-MICRO DX        |
| '01284' | RESP TB NEC-CULT DX         |
| '01285' | RESP TB NEC-HISTO DX        |
| '01286' | RESP TB NEC-OTH TEST        |
| '01300' | TB MENINGITIS-UNSPEC       |
| '01301' | TB MENINGITIS-NO EXAM       |
| '01302' | TB MENINGITIS-EXAM UNKN     |
| '01303' | TB MENINGITIS-MICRO DX      |
| '01304' | TB MENINGITIS-CULT DX       |
| '01305' | TB MENINGITIS-HISTO DX      |
| '01306' | TB MENINGITIS-OTH TEST      |
| '01310' | TUBRCLMA MENINGES-UNSPEC    |
| '01311' | TUBRCLMA MENING-NO EXAM     |
| '01312' | TUBRCLMA MENIN-EXAM UNKN    |
| '01313' | TUBRCLMA MENING-MICRO DX    |
| '01314' | TUBRCLMA MENING-CULT DX     |
| '01315' | TUBRCLMA MENING-HISTO DX    |
| '01316' | TUBRCLMA MENING-OTH TEST    |
| '01320' | TUBERCULOMA BRAIN-UNSPEC    |
| '01321' | TUBERCULOMA BRAIN-NO EXAM   |
| '01322' | TUBERCULOMA BRAIN-EXAM UNKN|
| '01323' | TUBERCULOMA BRAIN-MICRO DX  |
| '01324' | TUBERCULOMA BRAIN-CULT DX   |
| Code   | Description                      |
|--------|----------------------------------|
| '01325' | TUBRCLOMA BRAIN-HISTO DX         |
| '01326' | TUBRCLOMA BRAIN-OTH TEST        |
| '01330' | TB BRAIN ABSCESS-UNSPEC         |
| '01331' | TB BRAIN ABSCESS-NO EXAM        |
| '01332' | TB BRAIN ABSC-EXAM UNKN         |
| '01333' | TB BRAIN ABSC-MICRO DX          |
| '01334' | TB BRAIN ABSCESS-CULT DX        |
| '01335' | TB BRAIN ABSC-HISTO DX          |
| '01336' | TB BRAIN ABSC-OTH TEST          |
| '01340' | TUBRCLMA SP CORD-UNSPEC         |
| '01341' | TUBRCLMA SP CORD-NO EXAM        |
| '01342' | TUBRCLMA SP CD-EXAM UNKN        |
| '01343' | TUBRCLMA SP CRD-MICRO DX        |
| '01344' | TUBRCLMA SP CORD-CULT DX        |
| '01345' | TUBRCLMA SP CRD-HISTO DX        |
| '01346' | TUBRCLMA SP CRD-OTH TEST        |
| '01350' | TB SP CRD ABSCESS-UNSPEC        |
| '01351' | TB SP CRD ABSC-NO EXAM          |
| '01352' | TB SP CRD ABSC-EXAM UNKN        |
| '01353' | TB SP CRD ABSC-MICRO DX         |
| '01354' | TB SP CRD ABSC-CULT DX          |
| '01355' | TB SP CRD ABSC-HISTO DX         |
| '01356' | TB SP CRD ABSC-OTH TEST         |
| '01360' | TB ENCEPHALITIS-UNSPEC          |
| '01361' | TB ENCEPHALITIS-NO EXAM         |
| '01362' | TB ENCEPHALIT-EXAM UNKN         |
| '01363' | TB ENCEPHALITIS-MICRO DX        |
| '01364' | TB ENCEPHALITIS-CULT DX         |
| '01365' | TB ENCEPHALITIS-HISTO DX        |
| '01366' | TB ENCEPHALITIS-OTH TEST        |
| '01380' | CNS TB NEC-UNSPEC               |
| '01381' | CNS TB NEC-NO EXAM              |
| '01382' | CNS TB NEC-EXAM UNKN            |
| '01383' | CNS TB NEC-MICRO DX             |
| '01384' | CNS TB NEC-CULT DX              |
| '01385' | CNS TB NEC-HISTO DX             |
| '01386' | CNS TB NEC-OTH TEST             |
| '01390' | CNS TB NOS-UNSPEC               |
| '01391' | CNS TB NOS-NO EXAM              |
| '01392' | CNS TB NOS-EXAM UNKN            |
| '01393' | CNS TB NOS-MICRO DX             |
| '01394' | CNS TB NOS-CULT DX              |
| '01395' | CNS TB NOS-HISTO DX             |
| Code  | Description                  |
|-------|-----------------------------|
| '01396' | CNS TB NOS-OTH TEST          |
| '01400' | TB PERITONITIS-UNSPEC       |
| '01401' | TB PERITONITIS-NO EXAM      |
| '01402' | TB PERITONITIS-EXAM UNKN    |
| '01403' | TB PERITONITIS-MICRO DX     |
| '01404' | TB PERITONITIS-CULT DX      |
| '01405' | TB PERITONITIS-HISTO DX     |
| '01406' | TB PERITONITIS-OTH TEST     |
| '01480' | INTESTINAL TB NEC-UNSPEC    |
| '01481' | INTESTIN TB NEC-NO EXAM     |
| '01482' | INTESTIN TB NEC-EXAM UNKN   |
| '01483' | INTESTIN TB NEC-MICRO DX    |
| '01484' | INTESTIN TB NEC-CULT DX     |
| '01485' | INTESTIN TB NEC-HISTO DX    |
| '01486' | INTESTIN TB NEC-OTH TEST    |
| '01500' | TB OF VERTEBRA-UNSPEC      |
| '01501' | TB OF VERTEBRA-NO EXAM     |
| '01502' | TB OF VERTEBRA-EXAM UNKN   |
| '01503' | TB OF VERTEBRA-MICRO DX    |
| '01504' | TB OF VERTEBRA-CULT DX     |
| '01505' | TB OF VERTEBRA-HISTO DX    |
| '01506' | TB OF VERTEBRA-OTH TEST    |
| '01510' | TB OF HIP-UNSPEC           |
| '01511' | TB OF HIP-NO EXAM          |
| '01512' | TB OF HIP-EXAM UNKN        |
| '01513' | TB OF HIP-MICRO DX         |
| '01514' | TB OF HIP-CULT DX          |
| '01515' | TB OF HIP-HISTO DX         |
| '01516' | TB OF HIP-OTH TEST         |
| '01520' | TB OF KNEE-UNSPEC          |
| '01521' | TB OF KNEE-NO EXAM         |
| '01522' | TB OF KNEE-EXAM UNKN       |
| '01523' | TB OF KNEE-MICRO DX        |
| '01524' | TB OF KNEE-CULT DX         |
| '01525' | TB OF KNEE-HISTO DX        |
| '01526' | TB OF KNEE-OTH TEST        |
| '01550' | TB OF LIMB BONES-UNSPEC    |
| '01551' | TB LIMB BONES-NO EXAM      |
| '01552' | TB LIMB BONES-EXAM UNKN    |
| '01553' | TB LIMB BONES-MICRO DX     |
| '01554' | TB LIMB BONES-CULT DX      |
| '01555' | TB LIMB BONES-HISTO DX     |
| '01556' | TB LIMB BONES-OTH TEST     |
| Code | Description               |
|------|---------------------------|
| '01560' | TB OF MASTOID-UNSPEC    |
| '01561' | TB OF MASTOID-NO EXAM     |
| '01562' | TB OF MASTOID-EXAM UNKN  |
| '01563' | TB OF MASTOID-MICRO DX   |
| '01564' | TB OF MASTOID-CULT DX    |
| '01565' | TB OF MASTOID-HISTO DX   |
| '01566' | TB OF MASTOID-OTH TEST   |
| '01570' | TB OF BONE NEC-UNSPEC    |
| '01571' | TB OF BONE NEC-NO EXAM    |
| '01572' | TB OF BONE NEC-EXAM UNKN |
| '01573' | TB OF BONE NEC-MICRO DX  |
| '01574' | TB OF BONE NEC-CULT DX   |
| '01575' | TB OF BONE NEC-HISTO DX  |
| '01576' | TB OF BONE NEC-OTH TEST  |
| '01580' | TB OF JOINT NEC-UNSPEC   |
| '01581' | TB OF JOINT NEC-NO EXAM  |
| '01582' | TB OF JOINT NEC-EXAM UNKN|
| '01583' | TB OF JOINT NEC-MICRO DX |
| '01584' | TB OF JOINT NEC-CULT DX  |
| '01585' | TB OF JOINT NEC-HISTO DX |
| '01586' | TB OF JOINT NEC-OTH TEST |
| '01590' | TB BONE/JT NOS-UNSPEC    |
| '01591' | TB BONE/JT NOS-NO EXAM   |
| '01592' | TB BONE/JT NOS-EXAM UNKN|
| '01593' | TB BONE/JT NOS-MICRO DX  |
| '01594' | TB BONE/JT NOS-CULT DX   |
| '01595' | TB BONE/JT NOS-HISTO DX  |
| '01596' | TB BONE/JT NOS-OTH TEST  |
| '01600' | TB OF KIDNEY-UNSPEC      |
| '01601' | TB OF KIDNEY-NO EXAM     |
| '01602' | TB OF KIDNEY-EXAM UNKN   |
| '01603' | TB OF KIDNEY-MICRO DX    |
| '01604' | TB OF KIDNEY-CULT DX     |
| '01605' | TB OF KIDNEY-HISTO DX    |
| '01606' | TB OF KIDNEY-OTH TEST    |
| '01610' | TB OF BLADDER-UNSPEC     |
| '01611' | TB OF BLADDER-NO EXAM    |
| '01612' | TB OF BLADDER-EXAM UNKN  |
| '01613' | TB OF BLADDER-MICRO DX   |
| '01614' | TB OF BLADDER-CULT DX    |
| '01615' | TB OF BLADDER-HISTO DX   |
| '01616' | TB OF BLADDER-OTH TEST   |
| '01620' | TB OF URETER-UNSPEC      |

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| Code     | Description                      |
|----------|----------------------------------|
| '01621'  | TB OF URETER-NO EXAM             |
| '01622'  | TB OF URETER-EXAM UNKN           |
| '01623'  | TB OF URETER-MICRO DX            |
| '01624'  | TB OF URETER-CULT DX             |
| '01625'  | TB OF URETER-HISTO DX            |
| '01626'  | TB OF URETER-OTH TEST            |
| '01630'  | TB URINARY NEC-UNSPEC            |
| '01631'  | TB URINARY NEC-NO EXAM           |
| '01632'  | TB URINARY NEC-EXAM UNKN         |
| '01633'  | TB URINARY NEC-MICRO DX          |
| '01634'  | TB URINARY NEC-CULT DX           |
| '01635'  | TB URINARY NEC-HISTO DX          |
| '01636'  | TB URINARY NEC-OTH TEST          |
| '01640'  | TB EPIDIDYMIS-UNSPEC             |
| '01641'  | TB EPIDIDYMIS-NO EXAM            |
| '01642'  | TB EPIDIDYMIS-EXAM UNKN          |
| '01643'  | TB EPIDIDYMIS-MICRO DX           |
| '01644'  | TB EPIDIDYMIS-CULT DX            |
| '01645'  | TB EPIDIDYMIS-HISTO DX           |
| '01646'  | TB EPIDIDYMIS-OTH TEST           |
| '01650'  | TB MALE GENIT NEC-UNSPEC         |
| '01651'  | TB MALE GEN NEC-NO EXAM          |
| '01652'  | TB MALE GEN NEC-EX UNKN          |
| '01653'  | TB MALE GEN NEC-MICRO DX         |
| '01654'  | TB MALE GEN NEC-CULT DX          |
| '01655'  | TB MALE GEN NEC-HISTO DX         |
| '01656'  | TB MALE GEN NEC-OTH TEST         |
| '01660'  | TB OVARY & TUBE-UNSPEC           |
| '01661'  | TB OVARY & TUBE-NO EXAM          |
| '01662'  | TB OVARY/TUBE-EXAM UNKN          |
| '01663'  | TB OVARY & TUBE-MICRO DX         |
| '01664'  | TB OVARY & TUBE-CULT DX          |
| '01665'  | TB OVARY & TUBE-HISTO DX         |
| '01666'  | TB OVARY & TUBE-OTH TEST         |
| '01670'  | TB FEMALE GEN NEC-UNSPEC         |
| '01671'  | TB FEM GEN NEC-NO EXAM           |
| '01672'  | TB FEM GEN NEC-EXAM UNKN         |
| '01673'  | TB FEM GEN NEC-MICRO DX          |
| '01674'  | TB FEM GEN NEC-CULT DX           |
| '01675'  | TB FEM GEN NEC-HISTO DX          |
| '01676'  | TB FEM GEN NEC-OTH TEST          |
| '01690'  | GU TB NOS-UNSPEC                 |
| '01691'  | GU TB NOS-NO EXAM                |

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| Code   | Description               |
|--------|---------------------------|
| '01692'| GU TB NOS-EXAM UNKN       |
| '01693'| GU TB NOS-MICRO DX        |
| '01694'| GU TB NOS-CULT DX         |
| '01695'| GU TB NOS-HISTO DX        |
| '01696'| GU TB NOS-OTH TEST        |
| '01700'| TB SKIN/SUBCUTAN-UNSPEC   |
| '01701'| TB SKIN/SUBCUT-NO EXAM    |
| '01702'| TB SKIN/SUBCUT-EXAM UNKN |
| '01703'| TB SKIN/SUBCUT-MICRO DX   |
| '01704'| TB SKIN/SUBCUT-CULT DX    |
| '01705'| TB SKIN/SUBCUT-HISTO DX   |
| '01706'| TB SKIN/SUBCUT-OTH TEST   |
| '01710'| ERYTHEMA NODOS TB-UNSPEC  |
| '01711'| ERYTHEM NODOS TB-NO EXAM  |
| '01712'| ERYTHEM NOD TB-EXAM UNKN  |
| '01713'| ERYTHEM NOD TB-MICRO DX   |
| '01714'| ERYTHEM NODOS TB-CULT DX  |
| '01715'| ERYTHEM NOD TB-HISTO DX   |
| '01716'| ERYTHEM NOD TB-OTH TEST   |
| '01720'| TB PERIPH LYMPH-UNSPEC    |
| '01721'| TB PERIPH LYMPH-NO EXAM   |
| '01722'| TB PERIPH LYMPH-EXAM UNK  |
| '01723'| TB PERIPH LYMPH-MICRO DX  |
| '01724'| TB PERIPH LYMPH-CULT DX   |
| '01725'| TB PERIPH LYMPH-HISTO DX  |
| '01726'| TB PERIPH LYMPH-OTH TEST  |
| '01730'| TB OF EYE-UNSPEC          |
| '01731'| TB OF EYE-NO EXAM         |
| '01732'| TB OF EYE-EXAM UNKN      |
| '01733'| TB OF EYE-MICRO DX        |
| '01734'| TB OF EYE-CULT DX         |
| '01735'| TB OF EYE-HISTO DX        |
| '01736'| TB OF EYE-OTH TEST        |
| '01740'| TB OF EAR-UNSPEC          |
| '01741'| TB OF EAR-NO EXAM         |
| '01742'| TB OF EAR-EXAM UNKN       |
| '01743'| TB OF EAR-MICRO DX        |
| '01744'| TB OF EAR-CULT DX         |
| '01745'| TB OF EAR-HISTO DX        |
| '01746'| TB OF EAR-OTH TEST        |
| '01750'| TB OF THYROID-UNSPEC      |
| '01751'| TB OF THYROID-NO EXAM     |
| '01752'| TB OF THYROID-EXAM UNKN   |

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| Code   | Description               |
|--------|---------------------------|
| '01753'| TB OF THYROID-MICRO DX   |
| '01754'| TB OF THYROID-CULT DX    |
| '01755'| TB OF THYROID-HISTO DX   |
| '01756'| TB OF THYROID-OTH TEST   |
| '01760'| TB OF ADRENAL-UNSPEC     |
| '01761'| TB OF ADRENAL-NO EXAM    |
| '01762'| TB OF ADRENAL-EXAM UNKN |
| '01763'| TB OF ADRENAL-MICRO DX   |
| '01764'| TB OF ADRENAL-CULT DX    |
| '01765'| TB OF ADRENAL-HISTO DX   |
| '01766'| TB OF ADRENAL-OTH TEST   |
| '01770'| TB OF SPLEEN-UNSPEC      |
| '01771'| TB OF SPLEEN-NO EXAM     |
| '01772'| TB OF SPLEEN-EXAM UNKN  |
| '01773'| TB OF SPLEEN-MICRO DX    |
| '01774'| TB OF SPLEEN-CULT DX     |
| '01775'| TB OF SPLEEN-HISTO DX    |
| '01776'| TB OF SPLEEN-OTH TEST    |
| '01780'| TB ESOPHAGUS-UNSPEC      |
| '01781'| TB ESOPHAGUS-NO EXAM     |
| '01782'| TB ESOPHAGUS-EXAM UNKN  |
| '01783'| TB ESOPHAGUS-MICRO DX    |
| '01784'| TB ESOPHAGUS-CULT DX     |
| '01785'| TB ESOPHAGUS-HISTO DX    |
| '01786'| TB ESOPHAGUS-OTH TEST    |
| '01790'| TB OF ORGAN NEC-UNSPEC   |
| '01791'| TB OF ORGAN NEC-NO EXAM  |
| '01792'| TB ORGAN NEC-EXAM UNKN  |
| '01793'| TB OF ORGAN NEC-MICRO DX |
| '01794'| TB OF ORGAN NEC-CULT DX  |
| '01795'| TB OF ORGAN NEC-HISTO DX |
| '01796'| TB OF ORGAN NEC-OTH TEST |
| '01800'| ACUTE MILIARY TB-UNSPEC  |
| '01801'| ACUTE MILIARY TB-NO EXAM |
| '01802'| AC MILIARY TB-EXAM UNKN |
| '01803'| AC MILIARY TB-MICRO DX   |
| '01804'| ACUTE MILIARY TB-CULT DX |
| '01805'| AC MILIARY TB-HISTO DX   |
| '01806'| AC MILIARY TB-OTH TEST   |
| '01880'| MILIARY TB NEC-UNSPEC    |
| '01881'| MILIARY TB NEC-NO EXAM   |
| '01882'| MILIARY TB NEC-EXAM UNKN|
| '01883'| MILIARY TB NEC-MICRO DX  |
| Code | Description                           |
|------|---------------------------------------|
| '01884' | MILIARY TB NEC-CULT DX               |
| '01885' | MILIARY TB NEC-HISTO DX              |
| '01886' | MILIARY TB NEC-OTH TEST              |
| '01890' | MILIARY TB NOS-UNSPEC                |
| '01891' | MILIARY TB NOS-NO EXAM               |
| '01892' | MILIARY TB NOS-EXAM UNKN             |
| '01893' | MILIARY TB NOS-MICRO DX              |
| '01894' | MILIARY TB NOS-CULT DX               |
| '01895' | MILIARY TB NOS-HISTO DX              |
| '01896' | MILIARY TB NOS-OTH TEST              |
| '1370'  | LATE EFFECT TB- RESP/NOS             |
| '1371'  | LATE EFFECT CNS TB                   |
| '1372'  | LATE EFFECT GU TB                    |
| '1373'  | LATE EFF BONE & JOINT TB             |
| '1374'  | LATE EFFECT TB NEC                   |
| 'V1201' | HX TUBERCULOSIS (Begin 1994)         |
| '0200'  | BUBONIC PLAGUE                       |
| '0208'  | OTHER TYPES OF PLAGUE                |
| '0209'  | PLAGUE NOS                           |
| '0218'  | TULAREMIA NEC                        |
| '0219'  | TULAREMIA NOS                        |
| '0228'  | OTHER ANTHRAX MANIFEST               |
| '0229'  | ANTHRAX NOS                          |
| '0230'  | BRUCELLA MELITENSIS                  |
| '0231'  | BRUCELLA ABORTUS                     |
| '0232'  | BRUCELLA SUIS                        |
| '0233'  | BRUCELLA CANIS                       |
| '0238'  | BRUCELLOSIS NEC                      |
| '0239'  | BRUCELLOSIS NOS                      |
| '024'   | GLANDERS                             |
| '025'   | MELIOLIDOSIS                         |
| '0260'  | SPIRILLARY FEVER                     |
| '0269'  | RAT-BITE FEVER NOS                   |
| '0270'  | LISTERIOSIS                          |
| '0271'  | ERYSIPELOTHRIX INFECTION             |
| '0272'  | PASTEURELLOSIS                       |
| '0278'  | ZOONOTIC BACT DIS NEC                |
| '0279'  | ZOONOTIC BACT DIS NOS                |
| '0300'  | LEPROMATOUS LEPROSY                  |
| '0301'  | TUBERCULOID LEPROSY                  |
| '0302'  | INDETERMINATE LEPROSY                |
| '0303'  | BORDERLINE LEPROSY                   |
| '0308'  | LEPROSY NEC                          |

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| Code  | Description                      |
|-------|----------------------------------|
| '0309' | LEPROSY NOS                      |
| '0312' | DX DUE TO DISSEM MYCOBACT (Begin 1997) |
| '0318' | MYCOBACTERIAL DIS NEC            |
| '0319' | MYCOBACTERIAL DIS NOS            |
| '03289' | DIPHTHERIA NEC                   |
| '0329' | DIPHTHERIA NOS                   |
| '0330' | BORDETELLA PERTUSSIS             |
| '0331' | BORDETELLA PARAPERTUSSIS         |
| '0338' | WHOOPING COUGH NEC               |
| '0339' | WHOOPING COUGH NOS               |
| '0341' | SCARLET FEVER                    |
| '0363' | MENINGOCOCC ADRENAL SYND         |
| '03681' | MENINGOCOCC OPTIC NEURIT         |
| '03689' | MENINGOCOCCAL INFECT NEC         |
| '0369' | MENINGOCOCCAL INFECT NOS         |
| '037'  | TETANUS                          |
| '0398' | ACTINOMYCOSIS NEC                |
| '0399' | ACTINOMYCOSIS NOS                |
| '0401' | RHINOSCLEROMA                    |
| '0402' | WHIPPLE-S DISEASE                |
| '0403' | NECROBACILLOSIS                  |
| '04082' | TOXIC SHOCK SYNDROME (Begin 2002) |
| '04089' | BACTERIAL DISEASES NEC           |
| '0410' | STREPTOCOCCUS INFECT NOS (Begin 1980, End 1992) |
| '04100' | STREPTOCOCCUS UNSPEC (Begin 1992) |
| '04101' | GROUP A STREPTOCOCCUS (Begin 1992) |
| '04102' | GROUP B STREPTOCOCCUS (Begin 1992) |
| '04103' | GROUP C STREPTOCOCCUS (Begin 1992) |
| '04104' | GROUP D STREPTOCOCCUS (Begin 1992) |
| '04105' | GROUP G STREPTOCOCCUS (Begin 1992) |
| '04109' | OTHER STREPTOCOCCUS (Begin 1992) |
| '0411' | STAPH INFECTION NOS (Begin 1980, End 1992) |
| '04110' | STAPH UNSPEC (Begin 1992)        |
| '04111' | STAPH AUREUS (Begin 1992)        |
| '04119' | OTHER STAPH (Begin 1992)         |
| '0412' | PNEUMOCOCCUS INFECT NOS          |
| '0413' | KLEBSIELLA INFECT NOS            |
| '0414' | E. COLI INFECT NOS               |
| '0415' | H. INFLUENZAE INFECT NOS         |
| '0416' | PROTEUS INFECTION NOS            |
| '0417' | PSEUDOMONAS INFECT NOS           |
| '0418' | BACTERIAL INFECTION NEC (Begin 1980, End 1992) |
| '04181' | MYCOPLASMA (Begin 1992)          |
| Code   | Description                                      | Begin Year |
|--------|--------------------------------------------------|------------|
| '04182'| BACILLUS FRAGILIS (Begin 1992)                  |            |
| '04183'| CLOSTRID PERFRINGENS (Begin 1992)               |            |
| '04184'| OTHER ANAEROBES (Begin 1992)                    |            |
| '04185'| OTHER GRAM NEG ORGS (Begin 1992)                |            |
| '04186'| HELICOBACTER PYLORI INFECTION (Begin 1995)      |            |
| '04189'| OTHER SPEC BACTERIA (Begin 1992)                |            |
| '0419 '| BACTERIAL INFECTION NOS                         |            |
| '390 ' | RHEUM FEV W/O HRT INVOLV                         |            |
| '3929 '| RHEUMATIC CHOREA NOS                            |            |
| '7953 '| POSITIVE CULTURE FINDING (End 2002)              |            |
| '79531'| NONSPECIFIC POSITIVE FINDINGS/ANTHRAX (Begin 2002) |          |
| '79539'| OTHER NONSPECIFIC POSITIVE CULTURE (Begin 2002) |            |
| 'V090 '| INFEC-PENICILLIN-RESIST ORGS (Begin 1993)       |            |
| 'V091 '| INFEC-CEPHALOSPORIN-RESIST ORGS (Begin 1993)    |            |
| 'V092 '| INFEC-MACROLIDES-RESIST ORGS (Begin 1993)       |            |
| 'V093 '| INFEC-TETRACYCLINE-RESIST ORGS (Begin 1993)     |            |
| 'V094 '| INFEC-AMINOGLYCOSIDE-RESIST ORGS (Begin 1993)   |            |
| 'V0950'| INFEC-UNRESIST TO MULT QUINOLONES (Begin 1993)  |            |
| 'V0951'| INFEC-MULT QUINOLONES-RESIST ORGS (Begin 1993)  |            |
| 'V096 '| INFEC-SULFONAMIDES-RESIST ORGS (Begin 1993)     |            |
| 'V0970'| INFEC-NOT MULTI-ANTIMYCOBACT-RESIS (Begin 1993) |            |
| 'V0971'| INFEC-MULTI-ANTIMYCOBAC-RESIS ORGS (Begin 1993) |            |
| 'V0980'| INFEC-OTH ORGS NOT MULTIDRUG-RESIS (Begin 1993) |            |
| 'V0981'| INFEC-OTH MULTI-DRUG-RESIST ORGS (Begin 1993)   |            |
| 'V0990'| INFEC-UNSP ORGS NOT MULTIDRUG-RESIS (Begin 1993) |            |
| 'V0991'| INFEC-OTH SPEC MULTIDRUG-RESIST ORGS (Begin 1993) |          |
| '1125 '| DISSEMINATED CANDIDIASIS                         |            |
| '11284'| CANDIDAL ESOPHAGITIS (Begin 1992)               |            |
| '11289'| CANDIDIASIS SITE NEC                            |            |
| '1129 '| CANDIDIASIS SITE NOS                            |            |
| '1143 '| PROGRESS COCCIDIOID NEC                          |            |
| '1149 '| COCCIDIOIDOMYCOSIS NOS                           |            |
| '11500'| HISTOPLASMA CAPSULAT NOS                         |            |
| '11509'| HISTOPLASMA CAPSULAT NEC                         |            |
| '11510'| HISTOPLASMA DUBOISII NOS                         |            |
| '11519'| HISTOPLASMA DUBOISII NEC                         |            |
| '11590'| HISTOPLASMOSIS NOS                               |            |
| '11599'| HISTOPLASMOSIS NEC                               |            |
| '1160 '| BLASTOMYCOSIS                                    |            |
| '1161 '| PARACOCIDIOIDOMYCOSIS                            |            |
| '1162 '| LOBOMYCOSIS                                      |            |
| '1170 '| RHINOSPORIDIOSIS                                 |            |
| '1171 '| SPOROTRICHOSIS                                   |            |
CHROMOBLASTOMYCOSIS
ASPERGILLOSIS
MYCOTIC MYCETOMAS
CRYPTOCOCCOSIS
ALLESCHERIOSIS
ZYGOMYCOSIS
DEMATIACIOUS FUNGI INF
MYCOSES NEC & NOS
OPPORTUNISTIC MYCOSES

VARIOLA MAJOR
ALASTRIM
MODIFIED SMALLPOX
SMALLPOX NOS
COWPOX
PSEUDOCOWPOX
CONTAGIOUS PUSTULAR DERM
PARAVACCINIA NOS
POSTVARICELLA MYELITIS (Begin 2006)
VARICELLA COMPLICAT NEC
VARICELLA COMPLICAT NOS
VARICELLA UNCOMPLICATED
H ZOSTER NERV SYST NOS
GENICULATE HERPES ZOSTER
POSTHERPES TRIGEM NEURAL
POSTHERPES POLYNEUROPATH
HERPES ZOSTER MYELITIS (Begin 2006)
H ZOSTER NERV SYST NEC
H ZOSTER OTITIS EXTERNA
H ZOSTER COMPLICATED NEC
H ZOSTER COMPLICATED NOS
HERPES ZOSTER NOS
ECZEMA HERPETICUM
GENITAL HERPES NOS
HERPETIC VULVOVAGINITIS
HERPETIC ULCER OF VULVA
HERPETIC INFECT OF PENIS
GENITAL HERPES NEC
HERPETIC GINGIVOSTOMAT
HERPETIC WHITLOW
VISCERAL HERPES SIMPLEX
H SIMPLEX OTITIS EXTERNA
HERPES SIMPLEX MYELITIS (Begin 2006)
H SIMPLEX COMPLICAT NEC
| Code  | Description                                      |
|-------|--------------------------------------------------|
| '0548' | H SIMPLEX COMPLICAT NOS                         |
| '0549' | HERPES SIMPLEX NOS                               |
| '05579' | MEASLES COMPLICATION NEC                        |
| '0558' | MEASLES COMPLICATION NOS                        |
| '0559' | MEASLES UNCOMPPLICATED                          |
| '05600' | RUBELLA NERVE COMPL NOS                         |
| '05609' | RUBELLA NERVE COMPL NEC                         |
| '05679' | RUBELLA COMPLICATION NEC                        |
| '0568' | RUBELLA COMPLICATION NOS                        |
| '0569' | RUBELLA UNCOMPPLICATED                          |
| '0570' | ERYTHEMA INFECTIOSUM                            |
| '0578' | VIRAL EXANTHEMATATA NEC                          |
| '0579' | VIRAL EXANTHEMATATA NOS                         |
| '05810' | ROSEOLA INFANTUM NOS (Begin 2007)               |
| '05811' | ROSEOLA INFANT D/T HHV-6 (Begin 2007)           |
| '05812' | ROSEOLA INFANT D/T HHV-7 (Begin 2007)           |
| '05881' | HUMAN HERPESVIRUS 6 INFC (Begin 2007)           |
| '05882' | HUMAN HERPESVIRUS 7 INFC (Begin 2007)           |
| '05889' | HUMAN HERPESVIRS INF NEC (Begin 2007)           |
| '0600' | SYLVATIC YELLOW FEVER                            |
| '0601' | URBAN YELLOW FEVER                               |
| '0609' | YELLOW FEVER NOS                                 |
| '061'  | DENGUE                                          |
| '0650' | CRIMEAN HEMORRHAGIC FEV                         |
| '0651' | OMSK HEMORRHAGIC FEVER                          |
| '0652' | KYASANUR FOREST DISEASE                         |
| '0653' | TICK-BORNE HEM FEVER NEC                         |
| '0654' | MOSQUITO-BORNE HEM FEVER                         |
| '0658' | ARTHROPOD HEM FEVER NEC                          |
| '0659' | ARTHROPOD HEM FEVER NOS                         |
| '0660' | PHLEBOTOMUS FEVER                                |
| '0661' | TICK-BORNE FEVER                                 |
| '0663' | MOSQUITO-BORNE FEVER NEC                         |
| '0664' | WEST NILE FEVER (Begin 2002, End 2004)           |
| '06640' | WEST NILE FEVER NOS (Begin 2004)                |
| '06641' | WEST NILE FEVER W/ENCEPH (Begin 2004)           |
| '06642' | WEST NILE NEURO MAN NEC (Begin 2004)            |
| '06649' | WEST NILE W COMPLIC NEC (Begin 2004)            |
| '0668' | ARTHROPOD VIRUS NEC                              |
| '0669' | ARTHROPOD VIRUS NOS                              |
| '071'  | RABIES                                          |
| '0720' | MUMPS ORCHITIS                                  |
| '0723' | MUMPS PANCREATITIS                              |
| Code   | Description                        |
|--------|-----------------------------------|
| '07271' | MUMPS HEPATITIS                   |
| '07272' | MUMPS POLYNEUROPATHY              |
| '07279' | MUMPS COMPLICATION NEC            |
| '0728'  | MUMPS COMPLICATION NOS            |
| '0729'  | MUMPS UNCOMPLICATED               |
| '0737'  | ORNITHOSIS COMPLICAT NEC          |
| '0738'  | ORNITHOSIS COMPLICAT NOS          |
| '0739'  | ORNITHOSIS NOS                    |
| '0740'  | HERPANGINA                        |
| '0741'  | EPIDEMIC PLEURODYNIA              |
| '0743'  | HAND- FOOT & MOUTH DIS            |
| '0748'  | COXSACKIE VIRUS NEC               |
| '075'   | INFECTIOUS MONONUCLEOSIS          |
| '0783'  | CAT-SCRATCH DISEASE               |
| '0784'  | FOOT & MOUTH DISEASE              |
| '0785'  | CYTOMEegal INCLUSION DIS          |
| '0786'  | HEM NEPHROSONEPHRITIS            |
| '0787'  | ARENAVIRAL HEM FEVER              |
| '07888' | OTH SPEC DISEASE DUE TO CHLAMYDIAE (Begin 1993) |
| '07889' | VIRAL DISEASE NEC                 |
| '0790'  | ADENOVIRUS INFECT NOS             |
| '0791'  | ECHO VIRUS INFECT NOS             |
| '0792'  | COXSACKIE VIRUS INF NOS           |
| '0793'  | RHINOVIRUS INFECT NOS             |
| '0796'  | RESPIR SYNCITIAL VIRUS (Begin 1996) |
| '0798'  | VIRAL INFECTION NEC (End 1993)    |
| '07981' | HANTAVIRUS INFECTION (Begin 1995) |
| '07982' | SARS-ASSOCIATED CORONAVIRUS (Begin 2003) |
| '07983' | PARVovIRUS B19 (Begin 2007)       |
| '07988' | OTH SPEC CHLAMYDIAL INFECTION (Begin 1993) |
| '07989' | OTH SPEC VIRAL INFECTION (Begin 1993) |
| '0799'  | VIRAL INFECTION NOS (End 1993)    |
| '07998' | CHLAMYDIAL INFECTION NOS (Begin 1993) |
| '07999' | VIRAL INFECTION NOS (Begin 1993)  |
| '7908'  | VIREMIA NOS-                     |
| '080'   | LOUSE-BORNE TYPHUS                |
| '0810'  | MURINE TYPHUS                     |
| '0811'  | BRILL-S DISEASE                   |
| '0812'  | SCRUB TYPHUS                      |
| '0819'  | TYPHUS NOS                        |
| '0820'  | SPOTTED FEVERS                    |
| '0821'  | BOUTONNEUSE FEVER                 |
| '0822'  | NORTH ASIAN TICK FEVER            |
| Code  | Description                        |
|-------|------------------------------------|
| '0823' | QUEENSLAND TICK TYPHUS            |
| '08240' | EHRlichiosis- UNSPECIFIED (Begin 2000) |
| '08241' | EHRlichiosis CHAFEENSIS (Begin 2000) |
| '08249' | OTHER EHRlichiosis (Begin 2000)    |
| '0828'  | TICK-BORNE RICKETTS NEC            |
| '0829'  | TICK-BORNE RICKETTS NOS            |
| '0831'  | TRENCH FEVER                       |
| '0832'  | RICKETTSIALPOX                     |
| '0838'  | RICKETTSIOSES NEC                  |
| '0839'  | RICKETTSIOSES NOS                  |
| '0840'  | FALCIPARUM MALARIA                 |
| '0841'  | VIVAX MALARIA                      |
| '0842'  | QUARTAN MALARIA                    |
| '0843'  | OVALE MALARIA                      |
| '0844'  | MALARIA NEC                        |
| '0845'  | MIXED MALARIA                      |
| '0846'  | MALARIA NOS                        |
| '0847'  | INDUCED MALARIA                    |
| '0848'  | BLACKWATER FEVER                   |
| '0849'  | MALARIA COMPLICATED NEC            |
| '0850'  | VISCERAL LEISHMANIASIS             |
| '0851'  | CUTAN LEISHMANIAS URBAN            |
| '0852'  | CUTAN LEISHMANIAS ASIAN            |
| '0853'  | CUTAN LEISHMANIAS ETHIOP           |
| '0854'  | CUTAN LEISHMANIAS AMER             |
| '0855'  | MUCOCUTAN LEISHMANIASIS            |
| '0859'  | LEISHMANIASIS NOS                  |
| '0860'  | CHAGAS DISEASE OF HEART            |
| '0861'  | CHAGAS DIS OF OTH ORGAN            |
| '0862'  | CHAGAS DISEASE NOS                 |
| '0863'  | GAMBIAN TRYPANOSOMIASIS            |
| '0864'  | RHODESIAN TRYPANOSOMIAS            |
| '0865'  | AFRICAN TRYPANOSOMA NOS            |
| '0869'  | TRYPANOSOMIASIS NOS                |
| '0870'  | LOUSE-BORNE RELAPS FEVER           |
| '0871'  | TICK-BORNE RELAPS FEVER            |
| '0879'  | RELAPSING FEVER NOS                |
| '0880'  | BARTONELLOSION                     |
| '0888'  | ARTHROPOD-BORNE DIS NEC (Begin 1980, End 1989) |
| '08881' | LYME DISEASE (Begin 1989)          |
| '08882' | BABESIOSIS (Begin 1993)            |
| '08889' | OTH ARTHROPOD-BORNE DIS (Begin 1989) |
| '0889'  | ARTHROPOD-BORNE DIS NOS            |
| Code | Disease                                      |
|------|---------------------------------------------|
| '1000' | LEPTOSPIROS ICTEROHEM                       |
| '10089' | LEPTOSPIRAL INFECT NEC                     |
| '1009' | LEPTOSPIROSIS NOS                          |
| '101' | VINCENT'S ANGINA                           |
| '1020' | INITIAL LESIONS YAWS                       |
| '1021' | MULTIPLE PAPILLOMATA                       |
| '1022' | EARLY SKIN YAWS NEC                        |
| '1023' | HYPERKERATOSIS OF YAWS                     |
| '1024' | GUMMATA AND ULCERS- YAWS                   |
| '1025' | GANGOSA                                     |
| '1026' | YAWS OF BONE & JOINT                       |
| '1027' | YAWS MANIFESTATIONS NEC                    |
| '1028' | LATENT YAWS                                 |
| '1029' | YAWS NOS                                    |
| '1030' | PINTA PRIMARY LESIONS                      |
| '1031' | PINTA INTERMED LESIONS                     |
| '1032' | PINTA LATE LESIONS                         |
| '1033' | PINTA MIXED LESIONS                        |
| '1039' | PINTA NOS                                   |
| '1040' | NONVENEREAL ENDEMIC SYPH                   |
| '1048' | SPIROCHETAL INFECT NEC                     |
| '1049' | SPIROCHETAL INFECT NOS                     |
| '1200' | SCHISTOSOMA HAEMATOMOBIUM                  |
| '1201' | SCHISTOSOMA MANSONI                        |
| '1202' | SCHISTOSOMA JAPONICUM                      |
| '1203' | CUTANEOUS SCHISTOSOMA                      |
| '1208' | SCHISTOSOMIASIS NEC                        |
| '1209' | SCHISTOSOMIASIS NOS                        |
| '1210' | OPISTHORCHIASIS                            |
| '1211' | CLONORCHIASIS                              |
| '1212' | PARAGONIMIASIS                             |
| '1213' | FASCIOLIASIS                               |
| '1214' | FASCILOPSIASIS                             |
| '1215' | METAGONIMIASIS                             |
| '1216' | HETEROPHYIASIS                             |
| '1218' | TREMATODE INFECTION NEC                    |
| '1219' | TREMATODE INFECTION NOS                    |
| '1220' | ECHINOCOCIE GRANUL LIVER                   |
| '1221' | ECHINOCOCIE GRANUL LUNG                    |
| '1222' | ECHINOCOCIE GRAN THYROID                   |
| '1223' | ECHINOCOCIE GRANUL NEC                     |
| '1224' | ECHINOCOCIE GRANUL NOS                     |
| '1225' | ECHINOCOCIE MULTILOC LIVER                 |

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| Code  | Description                        |
|-------|------------------------------------|
| '1226' | ECHINOCOCC MULTILOC NEC           |
| '1227' | ECHINOCOCC MULTILOC NOS          |
| '1228' | ECHINOCOCCOSIS NOS LIVER           |
| '1229' | ECHINOCOCCOSIS NEC/NOS            |
| '1230' | TAENIA SOLIUM INTESTINE          |
| '1231' | CYSTICERCOSIS                     |
| '1232' | TAENIA SAGINATA INFECT           |
| '1233' | TAENIASIS NOS                     |
| '1234' | DIPHYLLOBOTHRIAS INTEST           |
| '1235' | SPARGANOSIS                       |
| '1236' | HYMENOLEPIASIS                     |
| '1238' | CESTODE INFECTION NEC             |
| '1239' | CESTODE INFECTION NOS              |
| '124'  | TRICHINOSIS                       |
| '1250' | BANCROFTIAN FILARIASIS            |
| '1251' | MALAYAN FILARIASIS                |
| '1252' | LOIASIS                            |
| '1253' | ONCHOCERCIASIS                     |
| '1254' | DIPETALONEMIASIS                  |
| '1255' | MANSONELLA OZZARDI INFEC          |
| '1256' | FILARIASIS NEC                    |
| '1257' | DRACONTIASIS                      |
| '1259' | FILARIASIS NOS                    |
| '1260' | ANCYLOSTOMA DUODENALE             |
| '1261' | NECATOR AMERICANUS                |
| '1262' | ANCYLOSTOMA BRAZILIENSE           |
| '1263' | ANCYLOSTOMA CLEYLICUM             |
| '1268' | ANCYLOSTOMA NEC                   |
| '1269' | ANCYLOSTOMIASIS NOS               |
| '1270' | ASCARIASIS                        |
| '1271' | ANISAKIASIS                       |
| '1272' | STRONGYLOIDIASIS                  |
| '1273' | TRICHURIASIS                      |
| '1274' | ENTEROBIAIS                       |
| '1275' | CAPILLARIASIS                     |
| '1276' | TRICHOSTRONGYLIASIS               |
| '1277' | INTEST HELMINTHIASIS NEC          |
| '1278' | MIXED INTESTINE HELMINTH          |
| '1279' | INTEST HELMINTHIASIS NOS          |
| '1280' | TOXOCARIASIS                      |
| '1281' | GNATHOSTOMIASIS                   |
| '1288' | HELMINTHIASIS NEC                 |
| '1289' | HELMINTHIASIS NOS                 |

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| Code    | Description                                      |
|---------|--------------------------------------------------|
| '129 '  | INTESTIN PARASITISM NOS                         |
| '1305'  | TOXOPLASMA HEPATITIS                            |
| '1307'  | TOXOPLASMOsis SITE NEC                          |
| '1308'  | MULTISYSTEM TOXOPLASMOS                         |
| '1309'  | TOXOPLASMOsis NOS                               |
| '13100' | UROGENITAL TRICHOMON NOS                        |
| '13101' | TRICHOMONAL VAGINITIS                           |
| '13102' | TRICHOMONAL URETHRITIS                          |
| '13103' | TRICHOMONAL PROSTATITIS                         |
| '13109' | UROGENITAL TRICHOMON NEC                        |
| '1318 ' | TRICHOMONIASIS NOS                              |
| '1319 ' | TRICHOMONIASIS NEC                              |
| '1338 ' | ACARIASIS NEC                                   |
| '1339 ' | ACARIASIS NOS                                   |
| '1340 ' | MYIASIS                                          |
| '1341 ' | ARTHROPOD INFEST NEC                            |
| '1342 ' | HIRIDINIASIS                                    |
| '1364 ' | FREE-LIVING AMEBA INFECT                        |
| '1366 ' | PSOROSPERMIASIS                                 |
| '1365 ' | SARCOSPORIDIOSIS                                |
| '1368 ' | INFECT/PARASITE DIS NEC                         |
| '1369 ' | INFECT/PARASITE DIS NOS                         |
| '0903 ' | SYPHILITIC KERATITIS                            |
| '0913 ' | SECONDARY SYPH SKIN                             |
| '0914 ' | SYPHILITIC ADENOPATHY                           |
| '09150' | SYPHILITIC UVEITIS NOS                          |
| '09151' | SYPHILIT CHORIORETINITIS                        |
| '09152' | SYPHILITIC IRIDOCYCLITIS                        |
| '09161' | SYPHILITIC PERIOSTITIS                          |
| '09162' | SYPHILITIC HEPATITIS                            |
| '09169' | SECOND SYPH VISCERA NEC                         |
| '0917 ' | SECOND SYPHILIS RELAPSE                         |
| '09182' | SYPHILITIC ALOPECIA                             |
| '09189' | SECONDARY SYPHILIS NEC                          |
| '0919 ' | SECONDARY SYPHILIS NOS                          |
| '0930 ' | AORTIC ANEURYSM- SYPHIL                         |
| '0931 ' | SYPHILITIC AORTITIS                             |
| '09320' | SYPHIL ENDOCARDITIS NOS                         |
| '09321' | SYPHILITIC MITRAL VALVE                         |
| '09322' | SYPHILITIC AORTIC VALVE                         |
| '09323' | SYPHIL TRICUSPID VALVE                          |
| '09324' | SYPHIL PULMONARY VALVE                          |
| '09381' | SYPHILITIC PERICARDITIS                         |
| Code     | Description                          |
|----------|--------------------------------------|
| '09382'  | Syphilitic myocarditis               |
| '09389'  | Cardiovascular syph NEC              |
| '0939'   | Cardiovascular syph NOS              |
| '09482'  | Syphilitic parkinsonism              |
| '09483'  | Syph disseminated retinitis          |
| '09484'  | Syphilitic optic atrophy             |
| '09485'  | Syph retrobulbar neuritis            |
| '09486'  | Syphil acoustic neuritis             |
| '09487'  | Syph rupt cereb aneurysm             |
| '0950'   | Syphilitic episcleritis              |
| '0958'   | Late symp syphilis NEC               |
| '0959'   | Late symp syphilis NOS               |
| '0970'   | Late syphilis NOS                    |
| '0979'   | Syphilis NOS                         |
| '09840'  | Gonococcal conjunctivit              |
| '09841'  | Gonococcal iridocyclitis             |
| '09842'  | Gonococcal endophthalmitis           |
| '09843'  | Gonococcal keratitis                 |
| '09849'  | Gonococcal eye NEC                   |
| '0986'   | Gonococcal infec pharynx             |
| '09881'  | Gonococcal keratitis                 |
| '09883'  | Gonococcal pericarditis              |
| '09884'  | Gonococcal endocarditis              |
| '09885'  | Gonococcal heart dis NEC             |
| '09889'  | Gonococcal inf site NEC              |
| '09950'  | Chlamydia-unspec site (Begin 1992)   |
| '09951'  | Chlamydia-pharynx (Begin 1992)       |
| '09959'  | Chlamydia-NSC (Begin 1992)           |
| '0213'   | Oculoglandular tularemia             |
| '03281'  | Conjunctival diphtheria              |
| '05320'  | Herpes zoster of eyelid              |
| '05321'  | H zoster keratoconjunct              |
| '05322'  | H zoster iridocyclitis               |
| '05329'  | Herpes zoster of eye NEC             |
| '05440'  | Herpes simplex eye NOS               |
| '05441'  | Herpes simplex of eyelid             |
| '05442'  | Dendritic keratitis                  |
| '05443'  | H simplex keratitis                  |
| '05444'  | H simplex iridocyclitis              |
| '05449'  | Herpes simplex eye NEC               |
| '05571'  | Measles keratitis                    |
| '0760'   | Trachoma- initial stage              |
| '0761'   | Trachoma- active stage               |
| Code  | Condition                                      |
|-------|-----------------------------------------------|
| '0769' | TRACHOMA NOS                                  |
| '0770' | INCLUSION CONJUNCTIVITIS                     |
| '0771' | EPIDEM KERATOCONJUNCTIV                      |
| '0772' | PHARYNGOCONJUNCT FEVER                       |
| '0773' | ADENOVIRAL CONJUNCT NEC                      |
| '0774' | EPIDEM HEM CONJUNCTIVIT                      |
| '0778' | VIRAL CONJUNCTIVITIS NEC                     |
| '0779' | VIRAL CONJUNCTIVITIS NOS (End 1993)          |
| '07798' | DIS OF CONJUNCT DUE TO CHLAMYDIAE (Begin 1993) |
| '07799' | DIS OF CONJUNCT DUE TO VIRUSES (Begin 1993)  |
| '11502' | HISTOPLASM CAPSUL RETINA                     |
| '11512' | HISTOPLASM DUBOIS RETINA                     |
| '11592' | HISTOPLASMOSIS RETINITIS                     |
| '1301' | TOXOPLASM CONJUNCTIVITIS                    |
| '1302' | TOXOPLASM CHORIORETINIT                      |
| '36000' | PURULENT ENDOPTHALM NOS                      |
| '36001' | ACUTE ENDOPTHALMITIS                         |
| '36002' | PANOPHTHALMITIS                              |
| '36003' | CHRONIC ENDOPTHALMITIS                       |
| '36004' | VITREOUS ABSCESS                             |
| '36013' | PARASITIC ENDOPTHAL NOS                      |
| '36019' | ENDOPTHALMITIS NEC                           |
| '37055' | CORNEAL ABSCESS                              |
| '37200' | ACUTE CONJUNCTIVITIS NOS                     |
| '37201' | SEROUS CONJUNCTIVITIS                        |
| '37202' | AC FOLLIC CONJUNCTIVITIS                     |
| '37203' | MUCOPUR CONJUNCTIVIT NEC                     |
| '37204' | PSEUDOMEMB CONJUNCTIVIT                      |
| '37210' | CHR CONJUNCTIVITIS NOS                       |
| '37211' | SIMPL CHR CONJUNCTIVITIS                     |
| '37212' | CHR FOLLIC CONJUNCTIVIT                      |
| '37213' | VERNAL CONJUNCTIVITIS                        |
| '37215' | PARASITIC CONJUNCTIVITIS                     |
| '37220' | BLEPHAROCONJUNCTIVIT NOS                     |
| '37221' | ANGULAR BLEPHAROCONJUNCT                    |
| '37222' | CONTACT BLEPHAROCONJUNCT                     |
| '37230' | CONJUNCTIVITIS NOS                           |
| '37239' | CONJUNCTIVITIS NEC                           |
| '37300' | BLEPHARITIS NOS                              |
| '37311' | HORDEOLUM EXTERNUM                           |
| '37312' | HORDEOLUM INTERNUM                           |
| '37313' | ABSCESS OF EYELID                            |
| '3734 ' | INFECT DERM LID W DEFORM                     |
| Code     | Description                          |
|----------|--------------------------------------|
| '3735'   | INFECTIOUS DERMATITIS LID NEC        |
| '3736'   | PARASITIC INFEST EYELID              |
| '37500'  | DACRYOADENITIS NOS                   |
| '37501'  | ACUTE DACRYOADENITIS                 |
| '37502'  | CHRONIC DACRYOADENITIS               |
| '37530'  | DACRYOCYSTITIS NOS                   |
| '37531'  | ACUTE CANALICULITIS                  |
| '37532'  | ACUTE DACRYOCYSTITIS                 |
| '37533'  | PHLEGMON DACRYOCYSTITIS              |
| '37541'  | CHRONIC CANALICULITIS                |
| '37542'  | CHRONIC DACRYOCYSTITIS               |
| '37601'  | ORBITAL CELLULITIS                   |
| '37602'  | ORBITAL PERIOSTITIS                  |
| '37603'  | ORBITAL OSTEOMYEITIS                 |
| '37604'  | ORBITAL TENONITIS                    |
| '37612'  | ORBITAL MYOSITIS                     |
| '37613'  | PARASITE INFEST- ORBIT               |
| '0552'   | POSTMEASLES OTITIS MEDIA             |
| '38100'  | AC NONSUP OTITIS MEDIA               |
| '38101'  | AC SEROUS OTITIS MEDIA               |
| '38102'  | AC MUCOID OTITIS MEDIA               |
| '38103'  | AC SANGUIN OTITIS MEDIA              |
| '38110'  | CHR SEROUS OM SIMP/NOS               |
| '38119'  | CHR SEROUS OM NEC                    |
| '38120'  | CHR MUCOID OM SIMP/NOS               |
| '38129'  | CHR MUCOID OM NEC                    |
| '3813'   | CHR NONSUP OM NOS/NEC                |
| '3814'   | NONSUPP OTITIS MEDIA NOS             |
| '38150'  | EUSTACHIAN SALPING NOS               |
| '38151'  | AC EUSTACHIAN SALPING                |
| '38152'  | CHR EUSTACHIAN SALPING               |
| '38200'  | AC SUPP OTITIS MEDIA NOS             |
| '38201'  | AC SUPP OM W DRUM RUPT               |
| '38202'  | AC SUPP OM IN OTH DIS                |
| '3821'   | CHR TUBOTYMpanic SUPPUR OM           |
| '3822'   | CHR ATTICOANTRL SUP OM               |
| '3823'   | CHR SUP OTITIS MEDIA NOS             |
| '3824'   | SUPPUR OTITIS MEDIA NOS              |
| '3829'   | OTITIS MEDIA NOS                     |
| '38300'  | AC MASTOIDITIS W/O COMPL             |
| '38301'  | SUBPERI MASTOID ABSCESS              |
| '38302'  | AC MASTOIDITIS-COMPL NEC             |
| '3831'   | CHRONIC MASTOIDITIS                  |

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| Code     | Description                      |
|----------|----------------------------------|
| '38320'  | PETROSITIS NOS                   |
| '38321'  | ACUTE PETROSITIS                 |
| '38322'  | CHRONIC PETROSITIS               |
| '3839'   | MASTOIDITIS NOS                  |
| '42490'  | ENDOCARDITIS NOS                 |
| '42491'  | ENDOCARDITIS IN OTH DIS          |
| '42499'  | ENDOCARDITIS NEC                 |
| '03282'  | DIPHTHERITIC MYOCARDITIS         |
| '03640'  | MENINGOCOCC CARDITIS NOS         |
| '03641'  | MENINGOCOCC PERICARDITIS         |
| '03642'  | MENINGOCOCC ENDOCARDITIS         |
| '03643'  | MENINGOCOCC MYOCARDITIS          |
| '11281'  | CANDIDAL ENDOCARDITIS            |
| '11503'  | HISTOPLASM CAPS PERICARD         |
| '11504'  | HISTOPLASM CAPS ENDOCARD         |
| '11513'  | HISTOPLASM DUB PERICARD          |
| '11514'  | HISTOPLASM DUB ENDOCARD          |
| '11593'  | HISTOPLASMOsis PERICARD          |
| '11594'  | HISTOPLASMOsis ENDOCARD          |
| '1303'   | TOXOPLASMA MYOCARDITIS           |
| '4210'   | AC/SUBAC BACT ENDOCARD           |
| '4211'   | AC ENDOCARDIT IN OTH DIS         |
| '4219'   | AC/SUBAC ENDOCARDIT NOS          |
| '42292'  | SEPTIC MYOCARDITIS               |
| '41512'  | SEPTIC PULMONARY EMBOLSM (Begin 2007) |
| '47822'  | PARAPHARYNGEAL ABSCESS           |
| '47824'  | RETROPHARYNGEAL ABSCESS          |
| '5225'   | PERIAPICAL ABSCESS               |
| '5273'   | SALIVARY GLAND ABSCESS           |
| '5283'   | CELLULITIS/ABSCESS MOUTH         |
| '9966'   | INFEC/INFLAM-DEVIC/ GRAFT (Begin 1980, End 1989) |
| '99660'  | REACTION-UNSP DEVIC/GRFT (Begin 1989) |
| '99661'  | REACT-CARDIAC DEV/ GRAFT (Begin 1989) |
| '99662'  | REACT-OTH VASC DEV/ GRAFT (Begin 1989) |
| '99663'  | REACT-NERV SYS DEV/ GRAFT (Begin 1989) |
| '99669'  | REACT-INT PROS DEVIC NEC (Begin 1989) |
| '99931'  | INFECT D/T CENT VEN CATH (Begin 2007) |
| '9985'   | POSTOPERATIVE INFECTION (End 1996) |
| '99851'  | INFECTED POSTOP SEROMA (Begin 1996) |
| '99859'  | OTH POSTOP INFECTION (Begin 1996) |
| '9993'   | INFEC COMPL MED CARE NEC (end 2007) |
| '99939'  | INFECT FOL INFUS/INJ/VAC (Begin 2007) |
| '683'    | ACUTE LYMPHADENITIS              |
**eAppendix 2. Imputations for Missing Antibiotic Susceptibilities by Pathogen**

Antibiotic susceptibilities were derived from *in vitro* reports generated by each institution. Individual institutional standards on susceptibility testing were unavailable. Intermediate susceptibilities were treated as resistant. When considering whether antibiotics were active against isolated pathogens, we assessed each potential pathogen-antibiotic combination using reported antibiotic susceptibilities when available. In many cases, however, susceptibilities to specific antibiotics administered were not explicitly listed in susceptibility reports. We therefore created a set of rules to impute these susceptibilities using microbiologic principles and knowledge of the spectrum of activity for each antibiotic-pathogen combination. A “key” to the abbreviations used in these imputations is shown below. In the following sections, the algorithms for each antibiotic-pathogen imputation are shown.

| Imputation Abbreviation | Explanation |
|-------------------------|-------------|
| R                       | This means that an organism will always be considered to be resistant to the antibiotic.  
  *Example: Ceftriaxone for Pseudomonas aeruginosa will always be treated as a non-active antibiotic* |
| S                       | This means that an organism will always be considered to be susceptible to the antibiotic.  
  *Example: Ceftriaxone for Methicillin-sensitive Staphylococcus aureus will always be treated as an active antibiotic* |
| if missing then E (alternate antibiotic) | This means that if the susceptibility to the antibiotic of interest is missing, then the algorithm looks at the antibiotic listed next to "E" and transposes that susceptibility.  
  *Example: For E.coli, "E imipenem" under meropenem means that if meropenem susceptibility is missing, but imipenem is reported as susceptible, then meropenem can be considered to be susceptible too.*  
  Some of these have a further logic built into it to handle cases where the other antibiotic susceptibility is missing too. These follow a hierarchical order; for example, for "E imipenem; if missing then E ertapenem" then the algorithm first looks to see if there is susceptibility reported for imipenem; if missing, then the algorithm looks for susceptibility for ertapenem. |
| if missing then .        | This means that if the susceptibility to the antibiotic is missing, then the algorithm will list that particular antibiotic-organism combination as missing (because an imputation could not be reliably performed). In several cases, this imputation to handle an antibiotic-organism combination as missing comes only if prior imputations were unable to produce a result. Patient encounters that have missing antibiotic-organism combinations were excluded from the analysis assessing adequacy of empiric antibiotics or unnecessarily broad antibiotics.* |
| if missing then R        | This means that the algorithm will report the organism to be resistant to the antibiotic if the susceptibility is missing. |
| if missing then S        | This means that the algorithm will report the organism to be susceptible to the antibiotic if the susceptibility is missing. |
# I. GRAM-NEGATIVE ORGANISMS

## A. *Acinetobacter* species

| Antibiotic             | Susceptibility Imputation |
|------------------------|---------------------------|
| Amikacin               | if missing then .         |
| Amoxicillin-Clavulanate| R                         |
| Ampicillin             | R                         |
| Ampicillin-Sulbactam   | if missing then R         |
| Azithromycin           | R                         |
| Aztreonam              | R                         |
| Cefadroxil             | R                         |
| Cefepime               | if missing then S if ceftriaxone-S or cefotaxime-S; else . |
| Ceftazidime            | if missing then S if ceftriaxone-S or cefotaxime-S; else . |
| Ceftriaxone            | if missing then E cefotaxime; if missing then R |
| Cefazolin              | R                         |
| Cefotaxime             | if missing then E ceftriaxone; if missing then R |
| Cefotetan              | if missing then R         |
| Cefoxitin              | if missing then R         |
| Cefpodoxime            | if missing then E ceftriaxone; if missing then E cefotaxime; if missing then R |
| Ceftaroline            | if missing then .         |
| Cefuroxime             | R                         |
| Cephalexin             | R                         |
| Ciprofloxacin          | if missing then .         |
| Clarithromycin         | R                         |
| Clindamycin            | R                         |
| Colistin               | if missing then .         |
| Daptomycin             | R                         |
| Dicloxacillin          | R                         |
| Doxycycline            | if missing then R         |
| Doripenem              | E meropenem               |
| Ertapenem              | if missing then .         |
| Gentamicin             | if missing then .         |
| Imipenem               | if missing then .         |
| Levofloxacin           | if missing then .         |
| Linezolid              | R                         |
| Meropenem              | if missing then S if imipenem-S; if missing then . |
| Metronidazole          | R                         |
| Minocycline            | if missing then R         |
| Moxifloxacin           | R                         |
| Nafcillin              | R                         |
| Oxacillin              | R                         |
| Penicillin             | R                         |
| Piperacillin-Tazobactam| if missing then S if piperacillin-S; if missing then . |
| Quinupristin-Dalfopristin | R                       |
| Tetracycline           | if missing then R         |
| Tigecycline            | if missing then .         |
| Tobramycin             | if missing then .         |
| TMP-SMX                | R                         |
| Vancomycin             | R                         |
## B. *Citrobacter species*

| Antibiotic                          | Susceptibility Imputation                                      |
|------------------------------------|----------------------------------------------------------------|
| Amikacin                           | if missing then .                                             |
| Amoxicillin-Clavulanate            | R                                                              |
| Ampicillin                         | R                                                              |
| Ampicillin-Sulbactam               | R                                                              |
| Azithromycin                       | R                                                              |
| Aztreonam                          | if missing then .                                             |
| Cefadroxil                         | R                                                              |
| Cefepine                           | if missing then S if ceftriaxone-S or cefotaxime-S; else .     |
| Cefazolin                          | R                                                              |
| Cefotaxime                         | if missing then E cefotaxime; if missing then .                |
| Cefotetan                          | R                                                              |
| Cefoxitin                          | R                                                              |
| Cefpodoxime                       | if missing then E cefotaxime; if missing then E cefotaxime; if missing then R |
| Ceftaroline                        | if missing then .                                             |
| Cefuroxime                         | R                                                              |
| Cephalexin                         | R                                                              |
| Ciprofloxacin                      | if missing then .                                             |
| Clarithromycin                     | R                                                              |
| Clindamycin                        | R                                                              |
| Colistin                           | if missing then R                                              |
| Daptomycin                         | R                                                              |
| Dicloxacillin                      | R                                                              |
| Doxycycline                        | if missing then S if tetracycline-S; else R                   |
| Doripenem                          | E meropenem                                                    |
| Ertapenem                          | if missing then S if ceftriaxone-S or cefotaxime-S; else .     |
| Gentamicin                         | if missing then .                                             |
| Imipenem                           | if missing then S if ceftriaxone-S or cefotaxime-S; else .     |
| Levofoxacin                        | if missing then .                                             |
| Linezolid                          | R                                                              |
| Meropenem                          | if missing then S if imipenem-S; if missing then S if ceftriaxone-S; or cefotaxime-S if missing then S if imipenem-S; if missing then S if ceftriaxone-S; or cefotaxime-S else . |
| Metronidazole                      | R                                                              |
| Minocycline                        | if missing then S if tetracycline-S; else R                   |
| Moxifloxacin                       | if missing then .                                             |
| Nafcillin                          | R                                                              |
| Oxacillin                          | R                                                              |
| Penicillin                         | R                                                              |
| Piperacillin-Tazobactam            | if missing then S if piperacillin-S; if missing then S if ceftriaxone-S or cefotaxime-S if missing then S if piperacillin-S; if missing then S if ceftriaxone-S or cefotaxime-S else . |
| Quinupristin-Dalfopristin          | R                                                              |
| Tetracycline                       | if missing then R                                              |
| Tigecycline                        | if missing then .                                             |
| Tobramycin                         | if missing then .                                             |
| TMP-SMX                            | if missing then S if trimethoprim-S; else .                   |
| Vancomycin                         | R                                                              |
## C. *Enterobacter* species

| Antibiotic                      | Susceptibility Imputation |
|---------------------------------|---------------------------|
| Amikacin                        | if missing then . |
| Amoxicillin-Clavulanate         | R |
| Ampicillin                      | R |
| Ampicillin-Sulbactam            | R |
| Azithromycin                    | if missing then . |
| Aztreonam                       | R |
| Cefadroxil                      | if missing then . |
| Cefepime                        | if missing then S if ceftriaxone-S or cefotaxime-S; else . |
| Ceftazidime                     | if missing then S if ceftriaxone-S or cefotaxime-S; else . |
| Ceftriaxone                     | if missing then E cefotaxime; if missing then . |
| Cefazolin                       | R |
| Cefotaxime                      | if missing then E ceftriaxone; if missing then . |
| Cefotetan                       | R |
| Cefoxitin                       | R |
| Cefpodoxime                     | if missing then E ceftriaxone; if missing then E cefotaxime; if missing then . |
| Ceftaroline                     | if missing then . |
| Cefuroxime                      | if missing then . |
| Cephalexin                      | R |
| Ciprofloxacin                   | if missing then . |
| Clarithromycin                  | R |
| Clindamycin                     | R |
| Colistin                        | if missing then . |
| Daptomycin                      | R |
| Dicloxacillin                   | R |
| Doxycycline                     | if missing then S if tetracycline-S; else R |
| Doripenem                       | E meropenem |
| Ertapenem                       | if missing then S if ceftriaxone-S or cefotaxime-S; else . |
| Gentamicin                      | if missing then . |
| Imipenem                        | if missing then S if ceftriaxone-S or cefotaxime-S; else . |
| Levofloxacin                    | if missing then . |
| Linezolid                       | R |
| Meropenem                       | if missing then S if imipenem-S; if missing then S if ceftriaxone-S or cefotaxime-S; else . |
| Metronidazole                   | R |
| Minocycline                     | if missing then S if tetracycline-S; else R |
| Moxifloxacin                    | if missing then . |
| Nafcillin                       | R |
| Oxacillin                       | R |
| Penicillin                      | R |
| Piperacillin-Tazobactam         | if missing then S if piperacillin-S; if missing then S if ceftriaxone-S or cefotaxime-S; else . |
| Quinupristin-Dalfopristin       | R |
| Tetracycline                    | if missing then R |
| Tigecycline                     | if missing then . |
| Tobramycin                      | if missing then . |
| TMP-SMX                         | if missing then S if trimethoprim-S; else . |
### D. *Escherichia coli*

| Antibiotic                        | Susceptibility Imputation                          |
|-----------------------------------|---------------------------------------------------|
| Vancomycin                        | R                                                 |

| Antibiotic                        | Susceptibility Imputation                          |
|-----------------------------------|---------------------------------------------------|
| Amikacin                          | if missing then .                                  |
| Amoxicillin-Clavulanate           | if missing then S if ampicillin-S; else .          |
| Ampicillin                        | if missing then .                                  |
| Ampicillin-Sulbactam              | if missing then E amoxicillin-clavulanate; if missing then S if ampicillin-S; else . |
| Azithromycin                      | if missing then E erythromycin; if missing then S if clarithromycin; if missing then R |
| Aztreonam                         | if missing then E ceftriaxone; if missing then S if cefotaxime; if missing then . |
| Cefadroxil                        | if missing then E cefazolin; if missing then .     |
| Cefepime                          | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Ceftazidime                       | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Ceftazacarbole                    | if missing then E cefotaxime; if missing then S if cefazolin-S; else . |
| Cefazolin                         | if missing then .                                  |
| Cefotetan                         | if missing then S if cefazolin-S; else .           |
| Cefoxitin                         | if missing then S if cefazolin-S; else .           |
| Cefpodoxime                       | if missing then E ceftriaxone; if missing then E cefotaxime; if missing then S if cefazolin-S; else . |
| Ceftaroline                       | if missing then .                                  |
| Cefuroxime                        | if missing then S if cefazolin-S; else .           |
| Cephalaxin                        | if missing then .                                  |
| Ciprofloxacin                     | if missing then .                                  |
| Clarithromycin                    | if missing then R                                  |
| Clindamycin                       | R                                                 |
| Colistin                          | if missing then .                                  |
| Daptomycin                        | R                                                 |
| Dicloxacillin                     | R                                                 |
| Doxycycline                       | if missing then S if tetracycline-S; else R        |
| Doripenem                         | E meropenem                                        |
| Ertapenem                         | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Gentamicin                        | if missing then .                                  |
| Imipenem                          | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Levofloxacin                      | if missing then .                                  |
| Linezolide                        | R                                                 |
| Meropenem                         | if missing then S if imipenem-S; if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Metronidazole                     | R                                                 |
| Minocycline                       | if missing then S if tetracycline-S; else R        |
| Moxifloxacin                      | if missing then .                                  |
| Nafcilin                          | R                                                 |
| Oxacillin                         | R                                                 |
| Penicillin                        | R                                                 |
| Piperacillin-Tazobactam           | if missing then S if piperacillin-S; if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |

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### Quinupristin-Dalfopristin
- **R**

### Tetracycline
- if missing then **R**

### Tigecycline
- if missing then

### Tobramycin
- if missing then

### TMP-SMX
- if missing then **S** if trimethoprim-**S**; else

### Vancomycin
- **R**

### E. *Klebsiella* species

| Antibiotic                        | Susceptibility Imputation                                      |
|-----------------------------------|----------------------------------------------------------------|
| Amikacin                          | if missing then                                               |
| Amoxicillin-Clavulanate           | if missing then                                               |
| Ampicillin                        | **R**                                                        |
| Ampicillin-Sulbactam               | if missing then *E* amoxicillin-clavulanate; if missing then   |
| Azithromycin                      | if missing then *E* erythromycin; if missing then *E* clarithromycin; if missing then **R** |
| Aztreonam                         | if missing then *E* ceftriaxone; if missing then *E* cefotaxime; if missing then **R** |
| Cefadroxil                        | if missing then *E* cefazolin; if missing then                 |
| Cefepime                          | if missing then *S* if ceftriaxone-**S** or cefotaxime-**S** or cefazolin-**S**; else |
| Cefazidime                        | if missing then *S* if ceftriaxone-**S** or cefotaxime-**S** or cefazolin-**S**; else |
| Ceftriaxone                       | if missing then *E* cefotaxime; if missing then *S* if cefazolin-**S**; else |
| Cefazolin                         | if missing then                                               |
| Cefotaxime                        | if missing then *E* ceftriaxone; if missing then *S* if cefazolin-**S**; else |
| Cefoxitin                         | if missing then *S* if cefazolin-**S**; else                  |
| Cefpodoxime                       | if missing then *E* ceftriaxone; if missing then *E* cefotaxime; if missing then *S* if cefazolin-**S**; if missing then **R** |
| Ceftaroline                       | if missing then                                               |
| Cefuroxime                        | if missing then *S* if cefazolin-**S**; else                  |
| Cephalexin                        | if missing then                                               |
| Ciprofloxacin                     | if missing then                                               |
| Clarithromycin                    | if missing then *E* erythromycin; if missing then *E* azithromycin; if missing then **R** |
| Clindamycin                       | **R**                                                        |
| Colistin                          | if missing then                                               |
| Daptomycin                        | **R**                                                        |
| Dicloxacillin                     | **R**                                                        |
| Doxycycline                       | if missing then *S* if tetracycline-**S**; else **R**          |
| Doripenem                         | *E* meropenem                                                 |
| Ertapenem                         | if missing then *S* if ceftriaxone-**S** or cefotaxime-**S** or cefazolin-**S**; else |
| Gentamicin                        | if missing then                                               |
| Imipenem                          | if missing then *S* if ceftriaxone-**S** or cefotaxime-**S** or cefazolin-**S**; else |
| Levofloxacin                      | if missing then                                               |
| Linezolid                         | **R**                                                        |
| Meropenem                         | if missing then *S* if imipenem-**S**; if missing then *S* if ceftriaxone-**S** or cefotaxime-**S** or cefazolin-**S**; else |
| Metronidazole                     | **R**                                                        |
| Minocycline                       | if missing then *S* if tetracycline-**S**; else **R**          |
| Moxifloxacin                      | if missing then                                               |
| Nafcillin                         | **R**                                                        |
| Oxacillin                         | **R**                                                        |
| Penicillin                        | **R**                                                        |

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### Piperacillin-Tazobactam

if missing then S if piperacillin-S; if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else .

### Quinupristin-Dalfopristin

R

### Tetracycline

if missing then R

### Tigecycline

if missing then .

### Tobramycin

if missing then .

### TMP-SMX

if missing then S if trimethoprim-S; else .

### Vancomycin

R

### F. *Proteus species*

| Antibiotic              | Susceptibility Imputation                                  |
|-------------------------|------------------------------------------------------------|
| Amikacin                | if missing then .                                          |
| Amoxicillin-Clavulanate | if missing then S if ampicillin-S; else .                  |
| Ampicillin              | if missing then .                                          |
| Ampicillin-Sublactam    | if missing then E amoxicillin-clavulanate; if missing then S if ampicillin-S; else . |
| Azithromycin            | if missing then E erythromycin; if missing then E clarithromycin; if missing then R |
| Aztreonam               | if missing then .                                          |
| Cefadroxil              | R                                                          |
| Cefepime                | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Cefepime                | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Cefotaxime              | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Cefotetan               | if missing then S if cefazolin-S; else .                   |
| Cefpodoxime             | if missing then E ceftriaxone; if missing then E cefotaxime; if missing then S if cefazolin-S; if missing then . |
| Cefixatoline            | if missing then .                                          |
| Cefuroxime              | if missing then .                                          |
| Cephalexin              | if missing then E cefazolin; if missing then .             |
| Ciprofloxacin           | if missing then .                                          |
| Clarithromycin          | if missing then R                                          |
| Clindamycin             | R                                                          |
| Colistin                | if missing then R                                          |
| Daptomycin              | R                                                          |
| Dicloxacillin           | R                                                          |
| Doxycycline             | R                                                          |
| Doripenem               | E meropenem                                               |
| Ertapenem               | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Gentamicin              | if missing then .                                          |
| Imipenem                | if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Levofloxacin            | if missing then .                                          |
| Linezolid               | R                                                          |
| Meropenem               | if missing then S if imipenem-S; if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Metronidazole           | R                                                          |
| Minocycline             | R                                                          |
| Moxifloxacin            | if missing then .                                          |
| Nafillin                | R                                                          |

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### Antibiotic Susceptibility Imputation

| Antibiotic                  | Susceptibility Imputation                      |
|-----------------------------|------------------------------------------------|
| Oxacillin                   | R                                              |
| Penicillin                  | R                                              |
| Piperacillin-Tazobactam     | if missing then S if piperacillin-S; if missing then S if ceftriaxone-S or cefotaxime-S or cefazolin-S; else . |
| Quinupristin-Dalfopristin  | R                                              |
| Tetracycline                | R                                              |
| Tigecycline                 | R                                              |
| Tobramycin                  | if missing then .                              |
| TMP-SMX                     | if missing then S if trimethoprim-S; else R    |
| Vancomycin                  | R                                              |

#### G. *Pseudomonas aeruginosa*

| Antibiotic                  | Susceptibility Imputation                      |
|-----------------------------|------------------------------------------------|
| Amikacin                    | if missing then .                              |
| Amoxicillin-Clavulanate     | R                                              |
| Ampicillin                  | R                                              |
| Ampicillin-Sulbactam        | R                                              |
| Azithromycin                | R                                              |
| Aztreonam                   | if missing then .                              |
| Cefadroxil                  | R                                              |
| Cefepime                    | if missing then .                              |
| Ceftazidime                 | if missing then .                              |
| Ceftriaxone                 | R                                              |
| Cefazolin                   | R                                              |
| Cefotaxime                  | R                                              |
| Cefotetan                   | R                                              |
| Cefoxitin                   | R                                              |
| Cefpodoxime                 | R                                              |
| Ceftaroline                 | R                                              |
| Cefuroxime                  | R                                              |
| Cephalexin                  | R                                              |
| Ciprofloxacin               | if missing then .                              |
| Clarithromycin              | R                                              |
| Clindamycin                 | R                                              |
| Colistin                    | if missing then .                              |
| Daptomycin                  | R                                              |
| Dicloxacillin               | R                                              |
| Doxycycline                 | R                                              |
| Doripenem                   | E meropenem                                     |
| Ertapenem                   | R                                              |
| Gentamicin                  | if missing then .                              |
| Imipenem                    | if missing then .                              |
| Levofloxacin                | if missing then .                              |
| Linezolid                   | R                                              |
| Meropenem                   | if missing then S if imipenem-S; if missing then . |
| Metronidazole               | R                                              |
| Minocycline                 | R                                              |
| Moxifloxacim                | R                                              |
| Nafcillin                   | R                                              |
| Oxacillin                   | R                                              |
| Penicillin                  | R                                              |

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| Antibiotic                        | Susceptibility Imputation                                                                 |
|----------------------------------|-------------------------------------------------------------------------------------------|
| Piperacillin-Tazobactam          | if missing then S if piperacillin-S; if missing then .                                     |
| Quinupristin-Dalfopristin        | R                                                                                         |
| Tetracycline                     | R                                                                                         |
| Tigecycline                      | R                                                                                         |
| Tobramycin                       | if missing then .                                                                          |
| TMP-SMX                          | R                                                                                         |
| Vancomycin                       | R                                                                                         |

### H. Serratia species

| Antibiotic                        | Susceptibility Imputation                                                                 |
|----------------------------------|-------------------------------------------------------------------------------------------|
| Amikacin                         | if missing then .                                                                          |
| Amoxicillin-Clavulanate          | R                                                                                         |
| Ampicillin                       | R                                                                                         |
| Ampicillin-Sulbactam             | R                                                                                         |
| Azithromycin                     | R                                                                                         |
| Aztreonam                        | if missing then .                                                                          |
| Cefadroxil                       | R                                                                                         |
| Cefepime                         | if missing then S if ceftriaxone-S or cefotaxime-S; else .                                |
| Ceftazidime                      | if missing then S if ceftriaxone-S or cefotaxime-S; else .                                |
| Ceftriaxone                      | if missing then E cefotaxime; if missing then .                                             |
| Cefazolin                        | R                                                                                         |
| Cefotaxime                       | if missing then E ceftriaxone; if missing then .                                             |
| Cefotetan                        | R                                                                                         |
| Cefoxitin                        | R                                                                                         |
| Cefpodoxime                      | if missing then E ceftriaxone; if missing then E cefotaxime; if missing then .             |
| Cefotaroline                     | if missing then .                                                                          |
| Cefuroxime                       | R                                                                                         |
| Cephalexin                       | R                                                                                         |
| Ciprofloxacin                    | if missing then .                                                                          |
| Clarithromycin                   | R                                                                                         |
| Clindamycin                      | R                                                                                         |
| Colistin                         | if missing then R                                                                           |
| Daptomycin                       | R                                                                                         |
| Dicloxacillin                    | R                                                                                         |
| Doxycycline                      | if missing then S if tetracycline-S; else R                                                |
| Doripenem                        | E meropenem                                                                                |
| Ertapenem                        | if missing then S if ceftriaxone-S or cefotaxime-S; else .                                |
| Gentamicin                       | if missing then .                                                                          |
| Imipenem                         | if missing then S if ceftriaxone-S or cefotaxime-S; else .                                |
| Levofloxacin                     | if missing then .                                                                          |
| Linezolid                        | R                                                                                         |
| Meropenem                        | if missing then S if imipenem-S; if missing then S if ceftriaxone-S or cefotaxime-S; else .|
| Metronidazole                    | R                                                                                         |
| Minocycline                      | if missing then S if tetracycline-S; else R                                                |
| Moxifloxacin                     | if missing then .                                                                          |

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| Antibiotic                  | Susceptibility |
|----------------------------|----------------|
| Nafcillin                  | R              |
| Oxacillin                  | R              |
| Penicillin                 | R              |
| Piperacillin-Tazobactam    | if missing then S if piperacillin-S; if missing then S if ceftriaxone-S or cefotaxime-S; if missing then . |
| Quinupristin-Dalfopristin | R              |
| Tetracycline               | if missing then R |
| Tigecycline                | if missing then . |
| Tobramycin                 | if missing then . |
| TMP-SMX                    | if missing then S if trimethoprim-S; else R |
| Vancomycin                 | R              |
II. **GRAM-POSITIVE ORGANISMS**

A. **Penicillin-sensitive *Staphylococcus aureus***

| Antibiotic                         | Susceptibility Imputation                                                                 |
|------------------------------------|------------------------------------------------------------------------------------------|
| Amikacin                           | R                                                                                        |
| Amoxicillin-Clavulanate            | S                                                                                        |
| Ampicillin                         | S                                                                                        |
| Ampicillin-Subactam                | S                                                                                        |
| Azithromycin                       | if missing then E erythromycin; if missing then .                                         |
| Aztreonam                          | R                                                                                        |
| Cefadroxil                         | S                                                                                        |
| Cefepime                           | S                                                                                        |
| Cefazidime                         | R                                                                                        |
| Ceftriaxone                        | S                                                                                        |
| Cefazolin                          | S                                                                                        |
| Cefotaxime                         | S                                                                                        |
| Cefotetan                          | S                                                                                        |
| Cefoxitin                          | S                                                                                        |
| Cefpodoxime                        | S                                                                                        |
| Ceftaroline                        | S                                                                                        |
| Cefuroxime                         | S                                                                                        |
| Cephalexin                         | S                                                                                        |
| Ciprofloxacin                      | R                                                                                        |
| Clarithromycin                     | if missing then E erythromycin; if missing then E azithromycin; if missing then .        |
| Clindamycin                        | if missing then .                                                                         |
| Colistin                           | R                                                                                        |
| Daptomycin                         | if missing then S                                                                         |
| Dicloxacillin                      | S                                                                                        |
| Doxycycline                        | if missing then S if tetracycline-S; else .                                              |
| Doripenem                          | S                                                                                        |
| Ertapenem                          | S                                                                                        |
| Gentamicin                         | R                                                                                        |
| Imipenem                           | S                                                                                        |
| Levofoxacin                        | if missing then E moxifloxacin; if missing then .                                         |
| Linezolid                          | if missing then S                                                                         |
| Meropenem                          | S                                                                                        |
| Metronidazole                      | R                                                                                        |
| Minocycline                        | if missing then S if tetracycline-S; else .                                              |
| Moxifloxacin                       | if missing then E levofloxacin; if missing then .                                         |
| Nafcillin                          | S                                                                                        |
| Oxacillin                          | S                                                                                        |
| Penicillin                         | S                                                                                        |
| Piperacillin-Tazobactam            | S                                                                                        |
| Quinupristin-Dalfopristin          | if missing then S                                                                         |
| Tetracycline                       | if missing then .                                                                         |
| Tigecycline                        | if missing then S                                                                         |
| Tobramycin                         | R                                                                                        |
| TMP-SMX                            | if missing then S if trimethoprim-S; if missing then .                                    |
| Vancomycin                         | if missing then S                                                                         |

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B. Methicillin-sensitive *Staphylococcus aureus*

| Antibiotic                          | Susceptibility Imputation                      |
|------------------------------------|-----------------------------------------------|
| Amikacin                           | R                                             |
| Amoxicillin-Clavulanate            | S                                             |
| Ampicillin                         | R                                             |
| Ampicillin-Sulbactam               | S                                             |
| Azithromycin                       | if missing then E erythromycin; if missing then . |
| Aztreonam                          | R                                             |
| Cefadroxil                         | S                                             |
| Celepine                           | S                                             |
| Ceftazidime                        | R                                             |
| Ceftriaxone                        | S                                             |
| Cefazolin                          | S                                             |
| Cefotaxime                         | S                                             |
| Cefpodoxime                        | S                                             |
| Cefpodoxime                        | S                                             |
| Cefotetan                          | S                                             |
| Cefoxitin                          | S                                             |
| Ceftazidime                        | S                                             |
| Ceftazidime                        | S                                             |
| Ceftazidime                        | S                                             |
| Ceftazidime                        | S                                             |
| Ciprofloxacin                      | R                                             |
| Clarithromycin                     | if missing then E erythromycin; if missing then E azithromycin; if missing then . |
| Clindamycin                        | if missing then .                             |
| Colistin                           | R                                             |
| Daptomycin                         | if missing then S                             |
| Dicloxacillin                      | S                                             |
| Dicloxacillin                      | S                                             |
| Doxycycline                        | if missing then S if tetracycline-S; else .    |
| Doripenem                          | S                                             |
| Ertapenem                          | S                                             |
| Gentamicin                         | R                                             |
| Imipenem                           | S                                             |
| Levofloxacin                       | if missing then E moxifloxacin; if missing then . |
| Linezolid                           | if missing then S                             |
| Meropenem                          | S                                             |
| Metronidazole                      | R                                             |
| Minocycline                        | if missing then S if tetracycline-S; else .    |
| Moxifloxacin                       | if missing then E levofloxacin; if missing then . |
| Nafcillin                          | S                                             |
| Oxacillin                          | S                                             |
| Penicillin                         | R                                             |
| Piperacillin-Tazobactam            | S                                             |
| Quinupristin-Dalfopristin          | if missing then S                             |
| Tetracycline                       | if missing then .                             |
| Tigecycline                        | if missing then S                             |
| Tobramycin                         | R                                             |
| TMP-SMX                            | if missing then S if trimethoprim-S; if missing then . |
| Vancomycin                         | if missing then S                             |
### C. Methicillin-Resistant *Staphylococcus aureus*

| Antibiotic                        | Susceptibility Imputation                                                                 |
|-----------------------------------|------------------------------------------------------------------------------------------|
| Amikacin                          | R                                                                                        |
| Amoxicillin-Clavulanate           | R                                                                                        |
| Ampicillin                        | R                                                                                        |
| Ampicillin-Sulbactam              | R                                                                                        |
| Azithromycin                      | if missing then E erythromycin; if missing then .                                         |
| Aztreonam                         | R                                                                                        |
| Cefadroxil                        | R                                                                                        |
| Cefepime                          | R                                                                                        |
| Ceftazidime                       | R                                                                                        |
| Ceftriaxone                       | R                                                                                        |
| Cefazolin                         | R                                                                                        |
| Cefotaxime                        | R                                                                                        |
| Cefotetan                         | R                                                                                        |
| Cefoxitin                         | R                                                                                        |
| Cefpodoxime                       | R                                                                                        |
| Ceftaroline                       | S                                                                                        |
| Cefuroxime                        | R                                                                                        |
| Cephalexin                        | R                                                                                        |
| Ciprofloxacin                     | R                                                                                        |
| Clarithromycin                    | if missing then E erythromycin; if missing then E azithromycin; if missing then .       |
| Clindamycin                       | if missing then .                                                                          |
| Colistin                          | R                                                                                        |
| Daptomycin                        | if missing then S                                                                           |
| Dicloxacillin                     | R                                                                                        |
| Doxycycline                       | if missing then S if tetracycline-S; else .                                                 |
| Doripenem                         | R                                                                                        |
| Ertapenem                         | R                                                                                        |
| Gentamicin                        | R                                                                                        |
| Imipenem                          | R                                                                                        |
| Levofloxacin                      | if missing then E moxifloxacin; if missing then .                                          |
| Linezolid                          | if missing then S                                                                          |
| Meropenem                         | R                                                                                        |
| Metronidazole                     | R                                                                                        |
| Minocycline                       | if missing then S if tetracycline-S; else .                                                 |
| Moxifloxacin                      | if missing then E levofloxacin; if missing then .                                          |
| Nafcillin                         | R                                                                                        |
| Oxacillin                         | R                                                                                        |
| Penicillin                        | R                                                                                        |
| Piperacillin-Tazobactam           | R                                                                                        |
| Quinupristin-Dalfopristin         | if missing then S                                                                           |
| Tetracycline                      | if missing then .                                                                          |
| Tigecycline                       | if missing then S                                                                           |
| Tobramycin                        | R                                                                                        |
| TMP-SMX                           | if missing then S if trimethoprim-S; if missing then .                                     |
### Antibiotic Susceptibility Imputation

| Antibiotic                          | Susceptibility Imputation |
|-------------------------------------|---------------------------|
| **Vancomycin**                      | if missing then S         |
| **Streptococcus pneumoniae**        |                           |
| Amikacin                            | R                         |
| Amoxicillin-Clavulanate             | if missing then S if penicillin-S; if missing then . |
| Ampicillin                          | if missing then E penicillin; if missing then . |
| Ampicillin-Sulbactam                | if missing then S if penicillin-S; if missing then . |
| Azithromycin                        | if missing then E erythromycin; if missing then . |
| Aztreonam                           | R                         |
| Cefadroxil                          | if missing then E cefazolin; if missing then S if penicillin-S; if missing then . |
| Cefepime                            | if missing then E cefotaxime; if missing then S if penicillin-S; if missing then . |
| Ceftazidime                         | R                         |
| Ceftriaxone                         | if missing then E cefotaxime; if missing then S if penicillin-S; if missing then . |
| Cefazolin                           | if missing then S if penicillin-S; if missing then . |
| Cefotaxime                          | if missing then S if penicillin-S; if missing then . |
| Cefotetan                           | if missing then R         |
| Cefoxitin                           | if missing then R         |
| Cefpodoxime                         | if missing then E cefotaxime; if missing then S if penicillin-S; if missing then . |
| Ceftaroline                         | if missing then S         |
| Cefuroxime                          | if missing then S if penicillin-S; if missing then . |
| Cephalexin                          | if missing then S if penicillin-S; if missing then . |
| Ciprofloxacin                       | R                         |
| Clarithromycin                      | if missing then E erythromycin; if missing then E azithromycin; if missing then . |
| Clindamycin                         | if missing then .         |
| Colistin                            | R                         |
| Daptomycin                          | if missing then S         |
| Dicloxacillin                       | if missing then S if penicillin-S; if missing then . |
| Doxycycline                         | if missing then S if tetracycline-S; else . |
| Doripenem                           | E meropenem               |
| Ertapenem                           | if missing then S if ceftriaxone-S; if missing then S if cefotaxime-S; if missing then S if penicillin-S; if missing then . |
| Gentamicin                          | R                         |
| Imipenem                            | if missing then S if ceftriaxone-S; if missing then S if cefotaxime-S; if missing then S if penicillin-S; if missing then . |
| Levofloxacin                        | if missing then .         |
| Linezolid                           | if missing then S         |
| Meropenem                           | if missing then S if ceftriaxone-S; if missing then S if cefotaxime-S; if missing then S if penicillin-S; if missing then . |
| Metronidazole                       | R                         |
| Minocycline                         | if missing then S if tetracycline-S; else . |
| Moxifloxacin                        | if missing then E levofloxacin; if missing then . |
| Nafcillin                           | if missing then S if penicillin-S; if missing then . |
| Oxacillin                           | if missing then S if penicillin-S; if missing then . |
| Penicillin                          | if missing then .         |
| Piperacillin-Tazobactam             | if missing then S if ceftriaxone-S; if missing then S if cefotaxime-S; if missing then . |
| Antibiotic                          | Susceptibility Imputation                                |
|------------------------------------|---------------------------------------------------------|
| Quinupristin-Dalfopristin          | S                                                       |
| Tetracycline                       | if missing then S                                       |
| Tigecycline                        | S                                                       |
| Tobramycin                         | R                                                       |
| TMP-SMX                            | if missing then S if trimethoprim-S; if missing then    |
| Vancomycin                         | S                                                       |

**E. Beta-Hemolytic *Streptococcus* species**

| Antibiotic                          | Susceptibility Imputation                                |
|------------------------------------|---------------------------------------------------------|
| Amikacin                           | R                                                       |
| Amoxicillin-Clavulanate            | if missing then S if penicillin-S; if missing then      |
| Ampicillin                         | if missing then E penicillin; if missing then           |
| Ampicillin-Sulbactam               | if missing then S if penicillin-S; if missing then      |
| Azithromycin                       | if missing then E erythromycin; if missing then         |
| Aztreonam                          | R                                                       |
| Cefadroxil                         | if missing then E cefazolin; if missing then S if penicillin-S; if missing then |
| Cefepime                           | S                                                       |
| Cefazidime                         | R                                                       |
| Ceftriaxone                        | S                                                       |
| Cefazolin                          | if missing then S if penicillin-S; if missing then      |
| Cefotaxime                         | S                                                       |
| Cefotetan                          | R                                                       |
| Cefoxitin                          | R                                                       |
| Cefpodoxime                        | S                                                       |
| Ceftriacline                       | S                                                       |
| Cefuroxime                         | S                                                       |
| Cephalaxin                         | if missing then S if penicillin-S; if missing then      |
| Ciprofloxacin                      | R                                                       |
| Clarithromycin                     | if missing then E erythromycin; if missing then E azithromycin; if missing then |
| Clindamycin                        | if missing then                                        |
| Colistin                           | R                                                       |
| Daptomycin                         | if missing then S                                       |
| Dicloxacillin                      | if missing then S if penicillin-S; if missing then      |
| Doxycycline                        | if missing then S if tetracycline-S; else               |
| Doripenem                          | S                                                       |
| Ertapenem                          | S                                                       |
| Gentamicin                         | R                                                       |
| Imipenem                           | S                                                       |
| Levofoxacin                        | if missing then S                                       |
| Linezolid                          | S                                                       |
| Meropenem                          | S                                                       |
| Metronidazole                      | R                                                       |
| Minocycline                        | if missing then S if tetracycline-S; else               |
| Moxifloxacin                       | if missing then E levofoxacin; if missing then S        |
| Nafcillin                          | if missing then S if penicillin-S; if missing then      |
| Oxacillin                          | if missing then S if penicillin-S; if missing then      |
| Penicillin                         | if missing then S                                       |
| Piperacillin-Tazobactam            | if missing then S                                       |
| Quinupristin-Dalfopristin          | S                                                       |
| Tetracycline                       | if missing then                                        |
| Antibiotic                      | Susceptibility Imputation                                                                 |
|--------------------------------|------------------------------------------------------------------------------------------|
| Tigecycline                    | S                                                                                        |
| Tobramycin                     | R                                                                                        |
| TMP-SMX                        | if missing then S if trimethoprim-S; if missing then .                                   |
| Vancomycin                     | S                                                                                        |

### F. Alpha-hemolytic / Viridans Streptococcus species

| Antibiotic                      | Susceptibility Imputation                                                                 |
|--------------------------------|------------------------------------------------------------------------------------------|
| Amikacin                        | R                                                                                        |
| Amoxicillin-Clavulanate         | if missing then S if penicillin-S; if missing then .                                      |
| Ampicillin                      | if missing then E penicillin; if missing then .                                           |
| Ampicillin-Sulbactam            | if missing then S if penicillin-S; if missing then .                                      |
| Azithromycin                    | if missing then E erythromycin; if missing then .                                         |
| Aztreonam                       | R                                                                                        |
| Cefadroxil                      | if missing then E cefazolin; if missing then S if penicillin-S; if missing then .          |
| Cefepime                        | if missing then E ceftriazone; if missing then S if penicillin-S; if missing then .         |
| Ceftazidime                     | R                                                                                        |
| Ceftriazone                     | if missing then E cefotaxime; if missing then S if penicillin-S; if missing then .          |
| Cefazolin                       | if missing then S if penicillin-S; if missing then .                                      |
| Cefotaxime                      | if missing then E ceftriazone; if missing then S if penicillin-S; if missing then .         |
| Cefotetan                       | R                                                                                        |
| Cefoxitin                       | if missing then R                                                                         |
| Cefpodoxime                     | if missing then E ceftriazone; if missing then E cefotaxime; if missing then S if penicillin-S; if missing then . |
| Ceftaroline                     | if missing then S                                                                         |
| Cefuroxime                      | if missing then S if penicillin-S; if missing then .                                      |
| Cephalexin                      | if missing then S if penicillin-S; if missing then .                                      |
| Ciprofloxacin                   | R                                                                                        |
| Clarithromycin                  | if missing then .                                                                         |
| Clindamycin                     | if missing then .                                                                         |
| Colistin                        | R                                                                                        |
| Daptomycin                      | if missing then S                                                                         |
| Dicloxacillin                   | if missing then S if penicillin-S; if missing then .                                      |
| Doxycycline                     | if missing then S if tetracycline-S; else R                                               |
| Doripenem                       | E meropenem                                                                              |
| Ertapenem                       | if missing then S if ceftriazone-S; if missing then S if cefotaxime-S; if missing then S if penicillin-S; if missing then . |
| Gentamicin                      | R                                                                                        |
| Imipenem                        | if missing then S if ceftriazone-S; if missing then S if cefotaxime-S; if missing then S if penicillin-S; if missing then . |
| Levofloxacin                    | if missing then .                                                                         |
| Linezolid                       | S                                                                                        |
| Meropenem                       | if missing then S if ceftriazone-S; if missing then S if cefotaxime-S; if missing then S if penicillin-S; if missing then . |
| Metronidazole                   | R                                                                                        |
| Minocycline                     | if missing then S if tetracycline-S; else .                                               |
| Moxifloxacin                    | if missing then E levofloxacin; if missing then .                                          |
| Nafcillin                       | if missing then S if penicillin-S; if missing then .                                      |
### G. Enterococcus species

| Antibiotic                  | Susceptibility Imputation                                                                 |
|-----------------------------|-------------------------------------------------------------------------------------------|
| Amikacin                    | R                                                                                          |
| Amoxicillin-Clavulanate     | if missing then E amoxicillin; if missing then E penicillin; if missing then                |
| Ampicillin                  | if missing then E penicillin; if missing then                                              |
| Ampicillin-Sulbactam        | if missing then E amoxicillin; if missing then E penicillin; if missing then                |
| Azithromycin                | R                                                                                          |
| Aztreonam                   | R                                                                                          |
| Cefadroxil                  | R                                                                                          |
| Cefepime                    | R                                                                                          |
| Ceftazidime                 | R                                                                                          |
| Ceftriaxone                 | R                                                                                          |
| Cefazolin                   | R                                                                                          |
| Cefotaxime                  | R                                                                                          |
| Cefotetan                   | R                                                                                          |
| Cefoxitin                   | R                                                                                          |
| Cefpodoxime                 | R                                                                                          |
| Ceftarolox                   | if missing then S                                                                          |
| Cefuroxime                  | R                                                                                          |
| Cefuroxime                  | R                                                                                          |
| Ciprofloxacin               | R                                                                                          |
| Clarithromycin              | R                                                                                          |
| Clindamycin                 | R                                                                                          |
| Colistin                    | R                                                                                          |
| Daptomycin                  | if missing then S                                                                          |
| Dicloxacillin               | R                                                                                          |
| Doxycycline                 | R                                                                                          |
| Doripenem                   | E meropenem                                                                                |
| Ertapenem                   | R                                                                                          |
| Gentamicin                  | R                                                                                          |
| Imipenem                    | if missing then E amoxicillin; if missing then E penicillin; if missing then                |
| Levofloxacin                | R                                                                                          |
| Linezolid                   | if missing then S                                                                          |
| Meropenem                   | if missing then E amoxicillin; if missing then E penicillin; if missing then                |
| Metronidazole               | R                                                                                          |
| Minocycline                 | R                                                                                          |
| Moxifloxacin                | R                                                                                          |
| Nafcillin                   | R                                                                                          |
| Oxacillin                   | R                                                                                          |
| Penicillin                  | if missing then                                                                             |
| Vancomycin                  | if missing then S                                                                          |
| Medicine               | Sensitivity     |
|-----------------------|-----------------|
| Piperacillin-Tazobactam| if missing then E ampicillin; if missing then E penicillin; if missing then . |
| Quinupristin-Dalfopristin| if missing then S |
| Tetracycline          | R               |
| Tigecycline           | if missing then S |
| Tobramycin            | R               |
| TMP-SMX               | R               |
| Vancomycin            | if missing then . |
eAppendix 3. Multiple Imputation Methods for Missing Data in Severity-of-Illness Covariates

For missing severity-of-illness covariates (all of which were continuous variables) included in the logistic regression models, we used the predictive mean matching method for imputation to avoid biologically impossible predictions (e.g., outside of plausible range), implemented using the MI procedure in SAS. For each missing value, the method imputes a value randomly selected from a set of observed values whose predicted values are close to the predicted value for the missing value from the simulated regression model (Heitjan and Little 1991; Schenker and Taylor 1996). Five imputed datasets were generated. Results were pooled using Proc MIANALYZE where the final estimates were the average of estimates from 5 model fits and the covariance was calculated based on Rubin's rule (Rubin 1987, p.137).

Heitjan, F. and Little, R. J. A. (1991), "Multiple Imputation for the Fatal Accident Reporting System," Applied Statistics, 40, 13–29.
Schenker, N. and Taylor, J. M. G. (1996), "Partially Parametric Techniques for Multiple Imputation," Computational Statistics and Data Analysis, 22, 425–446.
Rubin, D. B. (1987). Multiple Imputation for Nonresponse in Surveys. New York: John Wiley & Sons.
Abbreviations: MRSA = methicillin-resistant *Staphylococcus aureus*, CTX-RO = ceftriaxone-resistant gram-negative organism, VRE = vancomycin-resistant Enterococcus, ESBL = extended-spectrum beta-lactamase producing gram-negative organism, CRE = carbapenem-resistant Enterobacteriaceae.

Note: the denominators varied for each culture site: blood, n=6,968; respiratory, n=2,912; urine, n=9,077. Only cultures taken within the first two days of hospitalization were included in the analysis. Pathogens from other culture sites (deep tissue, central nervous system, body fluid, and superficial tissue) are not shown as they accounted for a very low proportion of all positive cultures.
eFigure 2. Prevalence of Resistant Organisms in Septic Shock vs Sepsis Without Shock

Abbreviations: MRSA = Methicillin-resistant Staphylococcus aureus, VRE = Vancomycin-resistant Enterococcus, CTX-RO = ceftriaxone-resistant gram-negative organisms (including Pseudomonas aeruginosa), ESBL = extended-spectrum beta-lactamase producing gram-negative, CRE = carbapenem-resistant Enterobacteriaceae. Septic shock was defined by the need for vasopressors among patients with presumed serious infection on admission.
Methicillin-resistant *Staphylococcus aureus* (MRSA) antibiotics = vancomycin, linezolid, and daptomycin.

Vancomycin-resistant Enterococcus (VRE) antibiotics = linezolid or daptomycin.

Anti-Pseudomonal (PsA) beta-lactams = ceftazidime, cefepime, piperacillin-tazobactam, aztreonam, imipenem, meropenem, or doripenem.
eFigure 4. Quantity of Missing Data for Severity-of-Illness Covariates

Note: missingness refers to whether or not covariates were measured within the 1st two days of hospital admission. Vital sign missingness was higher than expected as certain hospitals did not report vital signs in the database; however, vital sign availability increased in later years of the study. To address missingness, different sensitivity analyses were performed in addition to using multiple imputation (also see eTable 5).
eTable 1. Characteristics of Sepsis Patients Who Received Adequate vs Inadequate Empiric Therapy

| Characteristics                        | Inadequate Therapy (n=2,785) | Adequate Therapy (n=12,398) | p-value |
|----------------------------------------|------------------------------|-----------------------------|---------|
| Median Age (IQR)                       | 71 (60-83)                   | 68 (56-80)                  | <0.001  |
| Sex                                    |                              |                             | 0.73    |
| Male                                   | 1,247 (44.7%)                | 5,501 (44.4%)               |         |
| Female                                 | 1,539 (55.3%)                | 6,896 (55.6%)               |         |
| Race                                    |                              |                             | <0.001  |
| White                                  | 1,936 (69.5%)                | 9,239 (74.5%)               |         |
| Black                                  | 668 (24.0%)                  | 2,174 (17.5%)               |         |
| Other                                  | 181 (6.5%)                   | 985 (7.9%)                  |         |
| Select Comorbidities                   |                              |                             |         |
| Cancer (Solid, Mets, Lymph)            | 244 (8.8%)                   | 1,042 (8.4%)                | 0.54    |
| Chronic Lung Disease                   | 717 (25.8%)                  | 2,361 (19.0%)               | <0.001  |
| Congestive Heart Failure               | 676 (24.3%)                  | 2,334 (18.8%)               | <0.001  |
| Diabetes                               | 921 (33.1%)                  | 3,801 (30.7%)               | 0.01    |
| Liver Disease                          | 134 (4.8%)                   | 783 (5.9%)                  | 0.03    |
| Neurologic Disease                     | 635 (22.8%)                  | 2,127 (17.2%)               | <0.001  |
| Peripheral Vascular Disease            | 248 (8.9%)                   | 855 (6.9%)                  | <0.001  |
| Renal Disease                          | 632 (22.7%)                  | 2,345 (18.9%)               | <0.001  |
| AHRQ Elixhauser Score                  | 13 (5-21)                    | 11 (2-19)                   | <0.001  |
| Infectious Syndrome                    |                              |                             |         |
| Pulmonary                              | 3,063 (32.4%)                | 1,868 (32.6%)               | 0.85    |
| Urinary                                | 4,057 (42.9%)                | 3,232 (56.4%)               | <0.001  |
| Intra-abdominal                        | 1,347 (14.3%)                | 696 (12.1%)                 | <0.001  |
| Skin/Soft Tissue                       | 1,154 (12.2%)                | 427 (7.5%)                  | <0.001  |
| Bone/Joint                             | 397 (4.2%)                   | 141 (2.5%)                  | <0.001  |
| Central Nervous System                 | 125 (1.3%)                   | 43 (0.8%)                   | 0.01    |
| Obstetric/Gynecologic                  | 63 (0.7%)                    | 25 (0.4%)                   | 0.07    |
| Other                                  | 2,728 (28.9%)                | 1,689 (29.5%)               | 0.45    |
| Sepsis Organ Dysfunction               |                              |                             |         |
| Vasopressors                           | 762 (27.4%)                  | 4,168 (33.6%)               | <0.001  |
| Mechanical ventilation                 | 632 (22.7%)                  | 2,588 (20.9%)               | 0.03    |
| Renal                                  | 1,480 (53.1%)                | 6,465 (52.2%)               | 0.34    |
| Lactate                                | 1,158 (41.6%)                | 5,485 (44.2%)               | 0.01    |
| Hepatic                                | 222 (8.0%)                   | 1,455 (11.7%)               | <0.001  |
| Platelets                              | 272 (9.8%)                   | 1,583 (12.8%)               | <0.001  |
| Median SOFA Score on Admission         | 4 (2-7)                      | 4 (2-7)                     | 0.001   |
| Hospital LOS                           | 9 (6-14)                     | 8 (5-13)                    | <0.001  |
| Admitted to ICU                        | 1,248 (44.8%)                | 5,710 (46.1%)               | 0.23    |
| ICU LOS                                | 4 (3-7)                      | 4 (3-7)                     | 0.47    |
| In-Hospital Death                      | 488 (17.5%)                  | 2,011 (16.2%)               | 0.09    |
### eTable 2. Characteristics of Sepsis Patients Who Received Unnecessarily Broad vs Not Unnecessarily Broad Empiric Therapy

| Characteristics                        | Unnecessarily Broad (n=8,405) | Not Unnecessarily Broad (n=3,993) | p-value |
|----------------------------------------|-------------------------------|-----------------------------------|---------|
| Median Age (IQR)                       | 67 (55-79)                    | 71 (58-82)                        | <0.001  |
| Sex                                    |                               |                                   |         |
| Male                                   | 3989 (47.5%)                  | 1,513 (37.9%)                     | <0.001  |
| Female                                 | 4,416 (52.5%)                 | 2,480 (62.1%)                     |         |
| Race                                   |                               |                                   | <0.001  |
| White                                  | 6,186 (73.6%)                 | 3,053 (76.5%)                     |         |
| Black                                  | 1,552 (18.5%)                 | 622 (15.6%)                       |         |
| Other                                  | 667 (7.9%)                    | 318 (8.0%)                        |         |
| Select Comorbidities                  |                               |                                   |         |
| Cancer (Solid, Mets, Lymph)            | 771 (9.2%)                    | 271 (6.8%)                        | <0.001  |
| Chronic Lung Disease                   | 1,484 (17.7%)                 | 877 (22.0%)                       | <0.001  |
| Congestive Heart Failure               | 1,572 (18.7%)                 | 762 (19.1%)                       | 0.61    |
| Diabetes                               | 2,558 (30.4%)                 | 1,243 (31.1%)                     | 0.43    |
| Liver Disease                          | 508 (6.0%)                    | 224 (5.6%)                        | 0.34    |
| Neurologic Disease                     | 1,381 (16.4%)                 | 746 (18.7%)                       | 0.002   |
| Peripheral Vascular Disease            | 575 (6.8%)                    | 280 (7.0%)                        | 0.73    |
| Renal Disease                          | 1,573 (18.7%)                 | 772 (19.3%)                       | 0.41    |
| AHRQ Elixhauser Score                  | 11 (2-19)                     | 11 (3-18)                         | 0.110   |
| Infectious Syndrome                   |                               |                                   |         |
| Pulmonary                              | 2,678 (31.9%)                 | 1,228 (30.8%)                     | 0.21    |
| Urinary                                | 3,528 (42.0%)                 | 2,295 (57.5%)                     | <0.001  |
| Intra-abdominal                        | 1,166 (13.9%)                 | 417 (10.4%)                       | <0.001  |
| Skin/Soft Tissue                       | 1,019 (12.1%)                 | 279 (7.0%)                        | <0.001  |
| Bone/Joint                             | 338 (4.0%)                    | 82 (2.1%)                         | <0.001  |
| Central Nervous System                 | 122 (1.5%)                    | 27 (0.7%)                         | <0.001  |
| Obstetric/Gynecologic                  | 59 (0.7%)                     | 16 (0.4%)                         | 0.04    |
| Other                                  | 2,397 (28.5%)                 | 1,124 (28.2%)                     | 0.67    |
| Sepsis Organ Dysfunction               |                               |                                   |         |
| Vasopressors                           | 3,310 (39.4%)                 | 858 (21.5%)                       | <0.001  |
| Mechanical ventilation                 | 1,987 (23.6%)                 | 601 (15.1%)                       | <0.001  |
| Renal                                  | 4,247 (50.5%)                 | 2,218 (55.6%)                     | <0.001  |
| Lactate                                | 4,068 (48.4%)                 | 1,417 (35.5%)                     | <0.001  |
| Hepatic                                | 1,033 (12.3%)                 | 422 (10.6%)                       | 0.005   |
| Platelets                              | 1,182 (14.1%)                 | 401 (10.0%)                       | <0.001  |
| Median SOFA Score on Admission         | 5 (3-7)                       | 4 (2-6)                           | <0.001  |
| Hospital LOS                           | 9 (6-14)                      | 7 (5-11)                          | <0.001  |
| Admitted to ICU                        | 4,276 (50.9%)                 | 1,434 (35.9%)                     | <0.001  |
| ICU LOS                                | 4 (3-7)                       | 4 (3-6)                           | <0.001  |
| In-Hospital Death                      | 1,575 (18.7%)                 | 436 (10.9%)                       | <0.001  |
### eTable 3. Univariate and Multivariable Models Assessing Associations Between Inadequate or Unnecessarily Broad Empiric Antibiotic Therapy and In-Hospital Death

| Covariate                  | Univariate Model \(^a\) | Model Assessing Inadequate Therapy \(^b\) | Model Assessing Unnecessarily Broad Therapy \(^c\) |
|----------------------------|-------------------------|---------------------------------|---------------------------------|
|                            | Univariate OR [95% CI]   | p-value | Multivariable OR [95% CI]   | p-value | Multivariable OR [95% CI]   | p-value |
| **Age**                    | 1.01 [1.01-1.01]         | <0.001  | 1.02 [1.02-1.02]         | <0.001  | 1.03 [1.02-1.03]         | <0.001  |
| **Female Sex**             | 1.08 [0.99-1.18]         | 0.08    | 1.12 [1.00-1.25]         | 0.04    | 1.13 [1.00-1.28]         | 0.05    |
| **Race**                   |                         |         |                          |         |                          |         |
| White                      | Referent                | <0.001  | Referent                |         | -                          |         |
| Black                      | 1.29 [1.16-1.43]         | 0.010   | 1.08 [1.04-1.12]         | <0.001  | 1.16 [0.99-1.37]         | 0.07    |
| **Other**                  | 0.91 [0.76-1.07]         |         | 0.81 [0.77-0.85]         | <0.001  | 0.82 [0.65-1.04]         | 0.10    |
| **AHRQ Elixhauser Index**  |                         |         |                          |         |                          |         |
| Positive Culture Site      |                         |         |                          |         |                          |         |
| Blood Culture              | 1.24 [1.13-1.35]         | <0.001  | 1.02 [0.89-1.16]         | 0.83    | 0.93 [0.79-1.08]         | 0.35    |
| Body Fluid                 | 0.94 [0.78-1.13]         | 0.50    | -                        | -       | -                          |         |
| CNS                        | 1.75 [0.91-3.37]         | 0.010   | 1.69 [0.75-3.81]         | 0.20    | 1.91 [0.83-4.38]         | 0.13    |
| Deep Culture               | 0.66 [0.40-1.08]         | 0.010   | 0.73 [0.40-1.30]         | 0.28    | 0.44 [0.21-0.93]         | 0.03    |
| Other Culture              | 1.08 [0.70-1.65]         | 0.74    | -                        | -       | -                          |         |
| Respiratory Culture        | 2.01 [1.18-2.22]         | <0.001  | 0.68 [0.57-0.81]         | <0.001  | 0.67 [0.55-0.82]         | <0.001  |
| Superficial                | 0.62 [0.53-0.74]         | <0.001  | 0.68 [0.54-0.86]         | 0.001   | 0.59 [0.45-0.78]         | <0.001  |
| Urine                      | 0.69 [0.63-0.75]         | <0.001  | 1.21 [1.04-1.41]         | 0.02    | 1.26 [1.05-1.51]         | 0.01    |
| **Pathogen**               |                         |         |                          |         |                          |         |
| *Acinetobacter*            | 1.14 [0.76-1.71]         | 0.52    | -                        | -       | -                          |         |
| *Citrobacter*              | 1.29 [0.92-1.81]         | 0.14    | -                        | -       | -                          |         |
| *E.coli*                   | 0.65 [0.59-0.72]         | <0.001  | 0.77 [0.66-0.89]         | <0.001  | 0.78 [0.66-0.93]         | 0.004   |
| *Enterobacter*             | 1.09 [0.85-1.39]         | 0.51    | -                        | -       | -                          |         |
| *Klebsiella*               | 1.17 [1.03-1.33]         | 0.01    | 1.11 [0.93-1.32]         | 0.23    | 1.18 [0.97-1.44]         | 0.10    |
| *Serratia*                 | 1.05 [0.72-1.53]         | 0.81    | -                        | -       | -                          |         |
| *Proteus*                  | 0.86 [0.71-1.04]         | 0.12    | -                        | -       | -                          |         |
| *P.aeruginosa*             | 1.23 [1.06-1.43]         | 0.008   | 1.13 [0.90-1.44]         | 0.30    | 1.22 [0.90-1.67]         | 0.20    |
| *S.aureus*                 | 1.49 [1.35-1.64]         | <0.001  | 1.53 [1.29-1.80]         | <0.001  | 1.63 [1.34-1.98]         | <0.001  |
| *Streptococcus*            | 1.10 [0.98-1.25]         | 0.09    | 0.94 [0.79-1.13]         | 0.52    | 1.01 [0.83-1.23]         | 0.91    |
| *Enterococcus*             | 1.08 [0.94-1.23]         | 0.28    | -                        | -       | -                          |         |
| **Antibiotic-Resistant Pathogen** | 1.33 [1.21-1.47]        | <0.001  | 1.06 [0.90-1.24]         | 0.51    | 1.11 [0.91-1.35]         | 0.30    |
| **Infectious Syndrome**    |                         |         |                          |         |                          |         |
| Bone/Joint                 | 0.41 [0.30-0.56]         | <0.001  | 0.72 [0.50-1.04]         | 0.08    | 0.85 [0.57-1.27]         | 0.44    |
| CNS                        | 0.97 [0.64-1.47]         | 0.89    | -                        | -       | -                          |         |
| Genitourinary              | 0.46 [0.42-0.51]         | <0.001  | 0.55 [0.48-0.64]         | <0.001  | 0.52 [0.45-0.61]         | <0.001  |
| Intra-abdominal            | 0.87 [0.76-0.99]         | 0.03    | 0.67 [0.57-0.79]         | <0.001  | 0.66 [0.55-0.80]         | <0.001  |
| OB/GYN                     | 0.72 [0.38-1.36]         | 0.32    | -                        | -       | -                          |         |
| Other                      | 0.41 [0.37-0.46]         | <0.001  | 0.56 [0.49-0.64]         | <0.001  | 0.57 [0.49-0.67]         | <0.001  |
| Pulmonary                  | 1.54 [1.41-1.69]         | <0.001  | 1.12 [0.99-1.27]         | 0.06    | 1.08 [0.94-1.25]         | 0.26    |
| Skin/Soft Tissue           | 0.5 [0.50-0.70]          | <0.001  | 0.82 [0.67-1.01]         | 0.06    | 0.90 [0.71-1.13]         | 0.35    |
| **ICU on Admission**       | 2.47 [2.26-2.69]         | <0.001  | 0.93 [0.82-1.05]         | 0.26    | 0.90 [0.79-1.04]         | 0.15    |

*(Table continues on next page)*

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| Covariate                        | Univariate Model<sup>a</sup> | Model Assessing Inadequate Therapy<sup>b</sup> | Model Assessing Unnecessarily Broad Therapy<sup>c</sup> |
|---------------------------------|------------------------------|-----------------------------------------------|-----------------------------------------------------|
|                                 | Univariate OR [95% CI]      | p-value                                      | Multivariable OR [95% CI]  p-value                 | Multivariable OR [95% CI] p-value               |
| Severity of Illness             |                              |                                               |                                                     |                                                     |
| Albumin (min)                   | 0.37 [0.35-0.40]             | <0.001                                       | 0.55 [0.50-0.61] <0.001                              | 0.56 [0.50-0.62] <0.001                        |
| AST (max)                       | 1.00 [1.00-1.00]             | <0.001                                       | 1.00 [1.00-1.00] 0.14                                 | 1.00 [1.00-1.00] 0.19                         |
| Anion Gap (max)                 | 1.10 [1.09-1.11]             | <0.001                                       | 1.02 [1.01-1.04] <0.001                              | 1.02 [1.01-1.03] 0.008                        |
| Creatinine (max)                | 1.10 [1.08-1.12]             | <0.001                                       | 1.02 [0.99-1.05] 0.18                                 | 1.03 [0.99-1.06] 0.13                         |
| GCS (min)                       | 0.81 [0.80-0.82]             | <0.001                                       | 0.94 [0.92-0.95] <0.001                              | 0.93 [0.91-0.96] <0.001                        |
| Hematocrit (min)                | 0.97 [0.97-0.98]             | <0.001                                       | 1.01 [1.00-1.02] 0.003                                | 1.01 [1.00-1.02] 0.01                         |
| Lactate (max)                   | 1.36 [1.32-1.37]             | <0.001                                       | 1.13 [1.11-1.16] <0.001                              | 1.14 [1.11-1.17] <0.001                        |
| Mech Ventilation                | 4.86 [4.43-5.32]             | <0.001                                       | 2.14 [1.85-2.49] <0.001                              | 2.18 [1.84-2.59] <0.001                        |
| Platelet count (min)            | 1.00 [1.00-1.00]             | <0.001                                       | 1.00 [1.00-1.00] 0.007                                | 1.00 [1.00-1.00] 0.02                         |
| Resp Rate (max)                 | 1.02 [1.02-1.03]             | <0.001                                       | 1.00 [1.00-1.01] 0.03                                 | 1.00 [1.00-1.01] 0.08                         |
| Total Bilirubin (max)           | 1.10 [1.08-1.12]             | <0.001                                       | 1.06 [1.04-1.09] <0.001                              | 1.07 [1.05-1.10] <0.001                        |
| Sys Bld Press (min)             | 0.96 [0.96-0.96]             | <0.001                                       | 0.99 [0.99-1.00] <0.001                              | 0.99 [0.99-1.00] 0.01                         |
| Temperature (max)               | 0.89 [0.86-0.91]             | <0.001                                       | 0.93 [0.89-0.96] <0.001                              | 0.93 [0.89-0.96] <0.001                        |
| Vasopressor                     | 4.59 [4.19-5.02]             | <0.001                                       | 2.02 [1.77-2.30] <0.001                              | 2.10 [1.81-2.43] <0.001                        |
| WBC (max)                       | 1.01 [1.01-1.01]             | <0.001                                       | 1.00 [1.00-1.01] 0.25                                 | 1.00 [1.00-1.01] 0.17                         |
| Inadequate Empiric Therapy      | 1.10 [0.98-1.22]             | 0.09                                         | 1.19 [1.03-1.37] 0.02                                 | - -                                              |
| Unnecessarily Broad Therapy     | 1.88 [1.68-2.11]             | <0.001                                       | - -                                              | 1.22 [1.06-1.40] 0.007                        |

Abbreviations: CNS = central nervous system, ICU = intensive care unit, AST = aspartate aminotransferase, GCS = Glasgow Coma Scale, Mech Ventilation = mechanical ventilation, Resp Rate = Respiratory Rate, Sys Bld Press = systolic blood pressure, WBC = white blood cell count.

<sup>a</sup> Univariate models show the association between each covariate and in-hospital death among all culture-positive community-onset sepsis patients in the cohort (n=17,430). Admission year and hospital characteristics (bed size, region, teaching status) were significant at p<0.001 in the univariate screens but are not shown in the table.

<sup>b</sup> Multivariable model 1 shows the full model assessing the association between inadequate empiric antibiotic therapy (at least one organism recovered from a clinical culture site that was non-susceptible to all administered empiric antibiotics) and in-hospital death. This analysis was performed among culture-positive sepsis patients in whom each antibiotic-pathogen combination could be either directly measured or imputed (n=15,183).

<sup>c</sup> Multivariable model 2 shows the full model assessing the association between unnecessarily broad empiric antibiotic therapy and in-hospital death. This model was done among culture-positive sepsis patients who received adequate empiric antibiotic therapy and in whom each antibiotic-pathogen combination could be either directly measured or imputed (n=12,398). Unnecessarily broad empiric therapy indicates patients who received anti-MRSA (vancomycin, linezolid, daptomycin), anti-VRE (linezolid or daptomycin), anti-Pseudomonal beta-lactams (ceftazidime, cefepime, piperacillin-tazobactam, aztreonam, imipenem, meropenem, doripenem), or anti-ESBL therapy (any carbapenem) when none of those resistant organisms were isolated.
**eTable 4. Distribution of Values for Severity-of-Illness Covariates in Culture-Positive Sepsis Patients**

| Covariate                          | Mean (SD) | Median (IQR) | Units   |
|------------------------------------|-----------|--------------|---------|
| **Laboratory**                     |           |              |         |
| Anion Gap (max)                    | 14.0 (5.5)| 13.0 (10.0-16.3)| mEq/L  |
| Albumin (min)                      | 2.7 (0.7)| 2.7 (2.2-3.7)| g/dL    |
| Aspartate Aminotransferase (max)   | 155.2 (732.4)| 37 (23-75)  | units/L |
| Bilirubin (max)                    | 1.5 (2.2)| 0.8 (0.5-1.5)| mg/dL  |
| Creatinine (max)                   | 2.3 (2.0)| 1.7 (1.1-2.7)| mg/dL  |
| Hematocrit (min)                   | 31.3 (6.5)| 31.3 (27.0-35.6) | %       |
| Lactate (max)                      | 3.6 (3.3)| 2.6 (1.8-4.1)| mmol/L |
| Platelet Count (min)               | 193.8 (113.7)| 176 (117-249) | 10⁹ cells/L |
| White Blood Cell Count (max)       | 17.0 (12.4)| 15.0 (10.4-21.0) | 10⁹ cells/L |
| **Vital Signs or Mental Status**   |           |              |         |
| Glasgow Coma Scale (min)           | 11.6 (4.2)| 14 (8-15) | -       |
| Respiratory Rate (max)             | 32.0 (14.6)| 28 (22-36) | breaths/min |
| Systolic Blood Pressure (min)      | 85.1 (21.5)| 85 (70-99) | mmHg    |
| Temperature (max)                  | 100.4 (2.0)| 100.1 (98.8-101.8) | °Farenheit |

Note: the most abnormal (minimum or maximum) values of covariates within the first 2 days of hospitalization were used.
eTable 5. Sensitivity Analyses for Multivariable Models for In-Hospital Death Using Different Strategies to Account for Missing Severity-of-Illness Covariates

| Empiric Antibiotic Therapy Pattern | Strategy 1: Median Value Imputation | Strategy 2: Multiple Imputation, No missing vital signs | Strategy 3: No Missing Covariates |
|-----------------------------------|-------------------------------------|--------------------------------------------------------|----------------------------------|
| Inadequate Empiric Therapy        | OR [95% CI] (p-value)               | OR [95% CI] (p-value)                                   | OR [95% CI] (p-value)            |
|                                   | 1.17 [1.03-1.34] (p=0.02)          | 1.22 [1.02-1.48] (p=0.04)                               | 1.19 [1.00-1.42] (p=0.06)        |
| Unnecessarily Broad Therapy       | 1.21 [1.06-1.39] (p=0.006)         | 1.26 [1.04-1.53] (p=0.02)                               | 1.20 [0.93-1.55] (p=0.15)        |

Inadequate empiric therapy indicates patients who had at least organism recovered from a clinical culture site that was non-susceptible to all administered empiric antibiotics. Unnecessarily broad empiric therapy indicates patients who received anti-MRSA, anti-VRE, anti-Pseudomonal, or anti-ESBL therapy when none of those resistant organisms were isolated. Anti-MRSA agents included vancomycin, linezolid, and daptomycin; anti-VRE agents included linezolid and daptomycin; anti-Pseudomonal beta-lactams included ceftazidime, cefepime, piperacillin-tazobactam, imipenem, meropenem, and doripenem; anti-ESBL agents included imipenem, meropenem, doripenem, and ertapenem.

All models were adjusted for age, sex, race, AHRQ Elixhauser comorbidity score, site of positive clinical cultures, pathogen, presence of a resistant organism (MRSA, VRE, Ceftriaxone-resistant gram-negative organism, ESBL, or CRE), severity of illness on admission (ICU care, vasopressors, mechanical ventilation, serum lactate, creatinine, total bilirubin, white blood cell count, albumin, platelet count, hematocrit, anion gap, aspartate aminotransferase, temperature, systolic blood pressure, respiratory rate, and Glasgow Coma Scale), admission year, and hospital characteristics (region, bed size, and teaching status).

Strategy 1 for handling missing data imputed median values. Strategy 2 was limited to patients with no missing vital signs on admission, and used multiple imputation to account for laboratory covariates and Glasgow Coma Scale. Strategy 3 was limited to patients with no missing covariates. Each strategy yielded a different sample size, as below:

**Inadequate empiric therapy analysis:**
- Strategy 1: n=15,183 (2,499 deaths)
- Strategy 2: n=7,937 (1,369 deaths)
- Strategy 3: n=4,516 (931 deaths)

**Unnecessarily broad empiric therapy analysis:**
- Strategy 1: n=12,398 (2,011 deaths)
- Strategy 2: n=6,222 (1,052 deaths)
- Strategy 3: n=3,545 (727 deaths)