
Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

Appendix A. SCD-Related Complications

Acute Complications	Chronic Complications/End-organ Damage
<ul style="list-style-type: none"> • Priapism • Splenic sequestration • Hepatic sequestration • Acute Chest Syndrome • Stroke • Gall stones • Cerebrovascular accidents 	<ul style="list-style-type: none"> • Leg ulcer • Avascular necrosis • Renal failure • Hearing loss • Erectile dysfunction • Thromboembolic Diagnosis/ Venous thromboembolism • Thrombophilia • Pulmonary hypertension • Sickled hepatopathy • Retinopathy • Microalbuminuria • Gall bladder disease • Sickle chronic lung disease • Cerebrovascular disease

SCD, Sickle Cell Disease

Appendix B. SCD and VOC ICD codes

Disease	ICD-9-CM	ICD-10-CM	Description
Sickle cell disease	282.60	D57	Sickle cell anemia or disease
Sickle cell disease	---	D57.0	Hb-SS disease with VOC ^a
Sickle cell disease	282.61	D57.00	Sickle cell with Hb-S
Sickle cell disease	282.62	D57.00	Sickle cell with VOC ^a
Sickle cell disease	---	D57.1	Sickle cell without VOC
Sickle cell disease	282.63	D57.20	Sickle cell with Hb-C without VOC
Sickle cell disease	282.64	D57.21	Sickle cell with Hb-C with VOC ^a
Sickle cell disease	282.68	D57.80	Sickle cell with other abnormal hemoglobin without VOC
Sickle cell disease	---	D57.81	Other sickle cell disorders with VOC ^a
Sickle cell disease	282.69	D57.819	Sickle cell with other abnormal hemoglobin with VOC ^a
Sickle cell disease	282.41	D57.40	Sickle cell with thalassemia without VOC
Sickle cell disease	282.42	D57.41	Sickle cell with thalassemia with VOC ^a

^aCode to identify VOC.

CM, Clinical Modification; ICD, The International Classification of Diseases; SCD, Sickle Cell Disease; VOC, vaso-occlusive.

Appendix C. List of SCD Medications

Drug Class	Drug Name	HCPCS Codes (if any)*
Antibiotics	<i>Please see Appendix D for details of Antibiotics</i>	
Opioids	Morphine	J2270, J2271, J2275; S0093
	Hydromorphone	J1170; S0092
	Oxycodone	
	Methadone	J1230; S0109; H0020
	Levorphanol	J1960
	Meperidine	J2175, J2180
	Fentanyl	J3010
	Codeine	J0745
	Hydrocodone	
	Oxymorphone	J2410
	Nalbuphine	J2300
	Butorphanol	J0595
	Pentazocine	J3070
	Buprenorphine	J0571-J0575, J0592
	Tramadol	
	Propoxyphene	
	Duloxetine	
	Gabapentin	
	Oxycodone and aspirin	
	Oxycodone and acetaminophen	
NSAIDs	Celecoxib	
	Diclofenac	
	Diflunisal	
	Etodolac	
	Fenoprofen	
	Flurbiprofen	
	Ibuprofen	J1741; C9279
	Indomethacin	
	Ketoprofen	
	Ketorolac	J1885
	Mefenamic Acid	
	Meloxicam	
	Nabumetone	
	Naproxen	
	Oxaprozin	
	Piroxicam	
	Sulindac	
Tolmetin		

Appendix C. List of SCD Medications - Continued

Drug Class	Drug Name	HCPCS Codes (if any)*
Antimetabolite	Hydroxyurea	
Iron Chelating therapy	Deferoxamine (Desferal)	J0895
	Deferasirox (Exjade)	
	Deferiprone (Ferriprox)	
Tricyclic antidepressants	Amitriptyline	J1320, G6030
	Nortriptyline	G6037
	Antiemetics	J8597
Others	Folic acid	
	Pseudoephedrine	
	Aspirin	G8598. G8598
	Acetaminophen	G6039

HCPCS, The Healthcare Common Procedure Coding System; SCD, Sickle Cell Disease.

Appendix D. List of Antibiotics

Drug Class	Drug Name
Aminoglycosides	Amikacin
	Paromomycin
	Gentamicin
	Kanamycin
	Neomycin
	Netilmicin
	Tobramycin
	Streptomycin
	Spectinomycin(Bs)
Ansamycins	Geldanamycin
	Herbimycin
	Rifaximin
Carbacephem	Loracarbef
	Ertapenem
	Doripenem
	Imipenem/Cystatin
	Meropenem
Cephalosporins (First generation)	Cefadroxil
	Cefazolin
	Cefalotin or Cefalothin
	Cefalexin
Cephalosporins (Second generation)	Cefaclor
	Cefamandole
	Cefoxitin

Appendix D. List of Antibiotics - Continued

Drug Class	Drug Name
	Cefprozil
	Cefuroxime
Cephalosporins (Third generation)	Cefixime
	Cefdinir
	Cefditoren
	Cefoperazone
	Cefotaxime
	Cefpodoxime
	Ceftazidime
	Ceftibuten
	Ceftizoxime
	Ceftriaxone
Cephalosporins (Fourth generation)	Cefepime
	Ceftaroline fosamil
	Ceftobiprole
Glycopeptides	Teicoplanin
	Vancomycin
	Telavancin
	Dalbavancin
	Oritavancin
Lincosamides(Bs)	Clindamycin
	Lincomycin
Lipopeptide	Daptomycin
Macrolides(Bs)	Azithromycin
	Clarithromycin
	Dirithromycin
	Erythromycin
	Roxithromycin
	Troleandomycin
	Telithromycin
	Spiramycin
Monobactams	Aztreonam
Nitrofurans	Furazolidone
	Nitrofurantoin(Bs)
Oxazolidinones(Bs)	Linezolid
	Posizolid
	Radezolid
	Torezolid
Penicillins	Amoxicillin
	Ampicillin

Appendix D. List of Antibiotics - Continued

Drug Class	Drug Name
	Azlocillin
	Carbenicillin
	Cloxacillin
	Dicloxacillin
	Flucloxacillin
	Mezlocillin
	Methicillin
	Nafcillin
	Oxacillin
	Penicillin G
	Penicillin V
	Piperacillin
	Penicillin G
	Temocillin
	Ticarcillin
Penicillin combinations	Amoxicillin/clavulanate
	Ampicillin/sulbactam
	Piperacillin/tazobactam
	Ticarcillin/clavulanate
Polypeptides	Bacitracin
	Colistin
	Polymyxin B
Quinolones/Fluoroquinolone	Ciprofloxacin
	Enoxacin
	Gatifloxacin
	Gemifloxacin
	Levofloxacin
	Lomefloxacin
	Moxifloxacin
	Nalidixic acid
	Norfloxacin
	Ofloxacin
	Trovafloxacin
	Grepafloxacin
	Sparfloxacin
	Temafloxacin
Sulfonamides(Bs)	Mafenide
	Sulfacetamide

Appendix D. List of Antibiotics - Continued

Drug Class	Drug Name
	Sulfadiazine
	Silver sulfadiazine
	Sulfadimethoxine
	Sulfamethizole
	Sulfamethoxazole
	Sulfanilimide (archaic)
	Sulfasalazine
	Sulfisoxazole
	Trimethoprim-Sulfamethoxazole (Co-trimoxazole) (TMP-SMX)
	Sulfonamidochrysoidine (archaic)
Tetracyclines(Bs)	Demeclocycline
	Doxycycline
	Minocycline
	Oxytetracycline
	Tetracycline
Drugs against mycobacteria	Clofazimine
	Dapsone
	Capreomycin
	Cycloserine
	Ethambutol(Bs)
	Ethionamide
	Isoniazid
	Pyrazinamide
	Rifampicin (Rifampin in US)
	Rifabutin
	Rifapentine
	Streptomycin
Others	Arsphenamine
	Chloramphenicol(Bs)
	Fosfomicin
	Fusidic acid
	Metronidazole
	Mupirocin
	Platensimycin
	Quinupristin/Dalfopristin
	Thiamphenicol
	Tigecycline(Bs)
	Tinidazole
	Trimethoprim(Bs)
	Arsphenamine

Appendix E. List of SCD Management Procedures

SCD Management Procedures	ICD-9-CM Procedure/CPT and HCPCS codes
	ICD-9 Procedure: 99.01, 99.03–99.04
Blood transfusions	CPT: 36430, 36450, 36455, 36512, 86890, 86999, 86927, 86930-86932
	HCPCS: P9010, P9016, P9017, P9021, P9022, P9038, P9039, P9040
Pneumococcal vaccine	CPT: 90670, 90669, 90732
	HCPCS: G0009, S0195
Meningococcal vaccine	CPT: 90644, 90734, 90620, 90621, 90733
	HCPCS: G9414
Bone marrow transplants	ICD-9: 41.00-41.03
	CPT Codes: 38205-38215, 38230, 38232, 38240-38243
Transcranial doppler ultrasonography	CPT: 76506, 76536, 93886, 93888, 93880, 9388

CM, Clinical Modification; CPT, Current Procedural Terminology; ICD, The International Classification of Diseases; HCPCS, The Healthcare Common Procedure Coding System; SCD, Sickle Cell Disease.

Appendix F. Charlson Comorbidity Index Conditions

Conditions for CCI	ICD-9-CM codes	Weight
Myocardial infarction	410.x, 412.x	1
Congestive heart failure	398.91, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 425.4–425.9, 428.x	
Peripheral vascular disease	093, 437.3, 440.x, 441.x, 443.1–443.9, 447.1, 557.1, 557.9, V43.4	1
Cerebrovascular disease	362.34, 430.x–438.x	1
Dementia	290.x, 294.1, 331.2	1
Chronic pulmonary disease	416.8, 416.9, 490.x–505.x, 506.4, 508.1, 508.8	1
Rheumatic disease	446.5, 710.0–710.4, 714.0–714.2, 714.8, 725.x	1
Peptic ulcer disease	531.x–534.x	1
Mild liver disease	70.22, 70.23, 70.32, 70.33, 70.44, 70.54, 70.6, 70.9, 570.x, 571.x, 573.3, 573.4, 573.8, 573.9, V42.7	1
Diabetes without chronic complication	250.0–250.3, 250.8, 250.9	1
Diabetes with chronic complication	250.4–250.7	2
Hemiplegia or paraplegia	334.1, 342.x, 343.x, 344.0–344.6, 344.9	2
Renal disease	403.01, 403.11, 403.91, 404.02, 404.03, 404.12, 404.13, 404.92, 404.93, 582.x, 583.0–583.7, 585.x, 586.x, 588, V42.0, V45.1, V56.x	2
Any malignancy, including lymphoma and leukemia, except malignant neoplasm of skin	140.x–172.x, 174.x–195.8, 200.x–208.x, 238.6	2
Moderate or severe liver disease	456.0–456.2, 572.2–572.8	3
Metastatic solid tumor	196.x–199.x	6
AIDS/HIV	042.x–044.x	6

AIDS, Acquired Immunodeficiency Syndrome; CCI, Charlson Comorbidity Index; CM, Clinical Modification; HIV, Human Immunodeficiency Virus; ICD, The International Classification of Diseases.