

Supplemental Information

SUPPLEMENTAL TABLE 5 ICD-9 Codes Used for Low-risk Cohort Definition

Code	Definition
Inclusion codes	
76528	Other preterm infant, 35–36 weeks' gestation completed
76529	Other preterm infant, ≥ 37 weeks' gestation completed
7660	Exceptionally large infant (BW >4500 g)
7661	Other heavy-for-dates infants
7662	Late infant, not heavy-for-dates
76621	Postterm infant (40–42 wk)
76622	Prolonged gestation of infant (>42 wk, NOS)
V300	Single liveborn in hospital without mention of cesarean delivery
V3001	Single liveborn in hospital delivered by cesarean delivery
Medical exclusion codes	
Age or BW	
76500	Extreme immaturity, unspecified
76501	Extreme immaturity, <500 g
76502	Extreme immaturity, 500–749 g
76503	Extremely low BW newborn, 750–999 g
76504	Extreme immaturity, 1000–1249 g
76505	Extreme immaturity, 1250–1499 g
76511	Other preterm infants, <500 g
76512	Other preterm infants, 500–749 g
76513	Other preterm infants, 750–999 g
76514	Other preterm infants, 1000–1249 g
76515	Other preterm infants, 1250–1499 g
76521	<24 completed weeks' gestation
76522	24 completed weeks' gestation
76523	25–26 completed weeks' gestation
76524	27–28 completed weeks' gestation
76525	29–30 completed weeks' gestation
76526	31–32 completed weeks' gestation
76527	33–34 completed weeks' gestation
Diagnoses	
5180	Pulmonary collapse
7400	Anencephalus
7420	Encephalocele
7450	Common truncus
7451	Transposition of great vessels
7452	Tetralogy of Fallot
7453	Common ventricle
7457	Cor biloculare
7461	Tricuspid atresia and stenosis, congenital
74670	Hypoplastic left heart syndrome

SUPPLEMENTAL TABLE 5 Continued

Code	Definition
74686	Congenital heart block
74710	Coarctation
74711	Interruption of aortic arch
7473	Congenital anomalies of pulmonary artery
74731	Pulmonary artery coarctation and atresia
74739	Other anomalies of pulmonary artery and pulmonary circulation
74741	Total anomalous pulmonary venous return
7503	Tracheoesophageal fistula, esophageal atresia, and stenosis
7511	Atresia and stenosis of small intestine
7512	Atresia and stenosis of large intestine, rectum, and anal canal
75314	Polycystic kidney, autosomal recessive
7535	Exstrophy of urinary bladder
7566	Anomalies of diaphragm
75672	Omphalocele
75673	Gastroschisis
75679	Other congenital anomalies of abdominal wall
7581	Trisomy 13
7582	Trisomy 18
7594	Conjoined twins
7597	Multiple congenital anomalies
7670	Subdural and cerebral hemorrhage
7685	Severe birth asphyxia
7687	Hypoxic ischemic encephalopathy
769	Respiratory distress syndrome in newborn
7702	Interstitial emphysema and related conditions
7703	Pulmonary hemorrhage
77081	Primary apnea of newborn
77084	Respiratory failure of newborn
77087	Respiratory arrest of newborn
77088	Hypoxemia of newborn
7733	Hydrops fetalis of newborn
7734	Kernicterus due to isoimmunization
7747	Kernicterus not due to isoimmunization
7762	Disseminated intravascular coagulation in newborn
77750	Necrotizing enterocolitis in newborn, unspecified
77751	Stage 1 necrotizing enterocolitis in newborn
77752	Stage 2 necrotizing enterocolitis in newborn
77753	Stage 3 necrotizing enterocolitis in newborn
7776	Perinatal intestinal perforation
7780	Hydrops fetalis not due to isoimmunization
79902	Hypoxemia
7792	Cerebral depression, coma, and other abnormal cerebral signs
77985	Cardiac arrest of newborn
Surgical exclusion codes	
0066	Percutaneous transluminal coronary angioplasty
0102	Ventriculopuncture through previously implanted catheter
0109	Other cranial puncture

SUPPLEMENTAL TABLE 5 Continued

Code	Definition
0118	Other diagnostic procedures on brain and cerebral meninges
0124	Other craniotomy
0131	Incision of cerebral meninges
0139	Other incision of brain
0153	Lobectomy of brain
0201	Opening of cranial suture
0203	Formation of cranial bone flap
0204	Bone graft to skull
0205	Insertion of skull plate
0206	Other cranial osteoplasty
0212	Other repair of cerebral meninges
0214	Choroid plexectomy
022	Ventriculostomy
0234	Ventricular shunt to abdominal cavity
0239	Other operations to establish drain
0351	Repair of spinal meningocele
0352	Repair of spinal myelomeningocele
3129	Other permanent tracheostomy
313	Other incision of larynx or trachea
3173	Closure of other fistula of trachea
3179	Other repair and plastic operations
3198	Other operations on larynx
3199	Other operations on trachea
3229	Other local excision or destruction
3239	Other and unspecified segmental resection of lung
3241	Thoracoscopic lobectomy of lung
3249	Other lobectomy of lung
3328	Open biopsy of lung
340	Incision of chest wall and pleura
3401	Incision of chest wall
3409	Other incision of pleura
3421	Transpleural thoracoscopy
343	Excision or destruction of lesion or tissue of mediastinum
3452	Thoracoscopic decortication of lung
3499	Other operations on thorax
3501	Closed heart valvotomy, aortic valve
3503	Closed heart valvotomy, pulmonary valve
3510	Open heart valvuloplasty without replacement, unspecified valve
3511	Open heart valvuloplasty of aortic valve without replacement
3512	Open heart valvuloplasty of mitral valve without replacement
3513	Open heart valvuloplasty of pulmonary valve without replacement
3514	Open heart valvuloplasty of tricuspid valve without replacement
3522	Other replacement of aortic valve
3524	Other replacement of mitral valve
3525	Replacement of pulmonary valve with tissue graft
3526	Other replacement of pulmonary valve
3534	Infundibulectomy

SUPPLEMENTAL TABLE 5 Continued

Code	Definition
3541	Enlargement of existing atrial septal defect
3542	Creation of septal defect in heart
3551	Repair of atrial septal defect with prosthesis, open technique
3552	Repair of atrial septal defect with prosthesis, closed technique
3553	Repair of ventricular septal defect with prosthesis, open technique
3554	Repair of endocardial cushion defect with prosthesis
3555	Repair of ventricular septal defect with prosthesis, closed technique
3561	Repair of atrial septal defect with tissue graft
3562	Repair of ventricular septal defect with tissue graft
3563	Repair of endocardial cushion defect with tissue graft
3571	Other and unspecified repair of atrial septal defect
3572	Other and unspecified repair of ventricular septal defect
3573	Other and unspecified repair of endocardial cushion defect
3581	Total repair of tetralogy of Fallot
3582	Total repair of total anomalous pulmonary venous return
3583	Total repair of truncus arteriosus
3584	Total correction of transposition of the great vessels
3591	Interatrial transposition of venous return
3592	Creation of conduit between right ventricle and pulmonary artery
3594	Creation of conduit between atrium and pulmonary artery
3596	Percutaneous balloon valvuloplasty
3699	Other operations on vessels of heart
3721	Right heart cardiac catheterization
3722	Left heart cardiac catheterization
3723	Combined right and left heart cardiac catheterization
3725	Biopsy of heart
3733	Excision or destruction of other lesion or tissue of heart, open approach
3749	Other repair of heart and pericardium
3751	Heart transplant
3766	Insertion of implantable heart assist system
3771	Initial insertion of transvenous lead (electrode) into ventricle
3774	Insertion or replacement of epicardial lead (electrode) into epicardium
3783	Initial insertion of dual-chamber device
3794	Implantation or replacement of automatic cardioverter or defibrillator, total system
3799	Other operations on heart and pericardium
3835	Resection of vessel with anastomosis, other thoracic vessels
3845	Resection of vessel with replacement, thoracic vessels
3864	Other excision of vessels, aorta, abdominal
3884	Other surgical occlusion of vessels, aorta, abdominal
3885	Other surgical occlusion of vessels, thoracic vessels
3895	Venous catheterization for renal dialysis
390	Systemic to pulmonary artery shunt
3921	Caval-pulmonary artery anastomosis
3950	Angioplasty of other noncoronary vessels
3961	Extracorporeal circulation auxiliary to open heart surgery
3965	Extracorporeal membrane oxygenation
3972	Endovascular embolization or occlusion of head and neck vessels

SUPPLEMENTAL TABLE 5 Continued

Code	Definition
3995	Hemodialysis
4104	Autologous hematopoietic stem cell transplant without purging
4106	Cord blood stem cell transplant
415	Total splenectomy
4198	Other operations on bone marrow
4199	Other operations on spleen
4233	Endoscopic excision or destruction of lesion or tissue of esophagus
4239	Other destruction of lesion or tissue of esophagus
4251	Intrathoracic esophagoesophagostomy
4284	Repair of esophageal fistula, not elsewhere classified
4389	Other partial gastrectomy
4561	Multiple segmental resection of small intestine
4562	Other partial resection of small intestine
4571	Open and other multiple segmental resection of large intestine
4572	Open and other cecectomy
4573	Open and other right hemicolectomy
4574	Open and other resection of transverse colon
4576	Open and other sigmoidectomy
4579	Other and unspecified partial excision of large intestine
4591	Small-to-small intestinal anastomosis
4593	Other small-to-large intestinal anastomosis
4594	Large-to-large intestinal anastomosis
4595	Anastomosis to anus
4601	Exteriorization of small intestine
4603	Exteriorization of large intestine
4610	Colostomy, not otherwise specified
4611	Temporary colostomy
4620	Ileostomy, not otherwise specified
4621	Temporary ileostomy
4623	Other permanent ileostomy
4639	Other enterostomy
4676	Closure of fistula of large intestine
4679	Other repair of intestine
4680	Intraabdominal manipulation of intestine
4681	Intraabdominal manipulation of small intestine
4682	Intraabdominal manipulation of large intestine
5012	Open biopsy of liver
5059	Other transplant of liver
5123	Laparoscopic cholecystectomy
5131	Anastomosis of gallbladder to hepatic ducts
5136	Choledochoenterostomy
5137	Anastomosis of hepatic duct to gastrointestinal tract
5222	Other excision or destruction of lesion or tissue of pancreas or pancreatic duct
5370	Acquired hypertrophic pyloric stenosis
5372	Other and open repair of diaphragmatic hernia
5375	Repair of diaphragmatic hernia, abdominal approach, not otherwise specified
5380	Repair of diaphragmatic hernia with thoracic approach, not otherwise specified

SUPPLEMENTAL TABLE 5 Continued

Code	Definition
540	Incision of abdominal wall
5411	Exploratory laparotomy
5461	Reclosure of postoperative disruption of abdominal wall
547	Other repair of abdominal wall and peritoneum
5471	Repair of gastroschisis
5491	Percutaneous abdominal drainage
5493	Creation of cutaneoperitoneal fistula
5502	Nephrostomy
5503	Percutaneous nephrostomy without fragmentation
5524	Open biopsy of kidney
5539	Other local destruction or excision of renal lesion or tissue
554	Partial nephrectomy
5551	Nephroureterectomy
5569	Other kidney transplant
5586	Anastomosis of kidney
5587	Correction of ureteropelvic junction
560	Transurethral removal of obstruction from ureter and renal pelvis
562	Ureterotomy
5641	Partial ureterectomy
5661	Formation of other cutaneous ureter
5674	Ureteroneocystostomy
5689	Other repair of ureter
5699	Other operations on ureter
5717	Percutaneous cystostomy
5718	Other suprapubic cystostomy
5721	Vesicostomy
5722	Revision or closure of vesicostomy
5783	Repair of fistula involving bladder
5786	Repair of bladder exstrophy
5799	Other operations on bladder
580	Urethrotomy

NOS, not otherwise specified.

SUPPLEMENTAL TABLE 6 ICD-9 Codes Used for Diagnostic Subcohort Definition

Diagnosis and ICD-9 Code	Description
Jaundice and hyperbilirubinemia	
774.2	Neonatal jaundice associated with preterm delivery
774.6	Unspecified fetal and neonatal jaundice
774.3	Neonatal jaundice due to delayed conjugation cause unspecified
Transient tachypnea of the newborn, 770.6	Transient tachypnea of the newborn
Observation for suspected sepsis or sepsis	
771.81	Septicemia (sepsis) of newborn
V29.0	Observation for suspected infectious condition
Hypoglycemia, 775.6	Neonatal hypoglycemia
Hypothermia	
991.6	Hypothermia
780.65	Hypothermia not associated with low environmental temperature
778.3	Other hypothermia of newborn
778.4	Other disturbances of temperature regulation of newborn
NAS, 779.5	Drug withdrawal syndrome in a newborn

SUPPLEMENTAL TABLE 7 Association of NICR Average Number of SCDs and LOS With 30-Day Readmission Rate

	Overall	Jaundice	Tachypnea	Hypoglycemia	Sepsis	Hypothermia
F statistic	<0.01	0.08	0.21	0.03	0.05	<0.001
Coefficient of determination (R^2)	0.48	0.24	0.17	0.31	0.29	0.58
SCDs						
Coefficient	-0.0013	-0.068	-0.1830	-0.6523	0.1862	2.4432
P	.97	.89	.72	.25	.63	.05
LOS						
Coefficient	-0.4726	-0.2538	0.0397	1.8049	0.6766	-1.8098
P	.30	.69	.97	.04	.26	.35
State (TX referent category)						
Coefficient	-0.4429	-0.6793	1.1422	1.102	0.9886	7.6452
P	.06	.06	.42	.12	.06	.01

The model independent variables were state (MA and TX), SCDs per newborn of infants with a SCD, and LOS per newborn. The model dependent variable was 30-d readmissions. The analytic weights were the number of newborns within cohort or subcohort ($n = 28$).

SUPPLEMENTAL TABLE 8 NICR-Level Correlations of SCD and LOS Per Newborn Across Diagnostic Subcohorts

	Jaundice		Tachypnea		Hypoglycemia		Sepsis	
	SCD	LOS	SCD	LOS	SCD	LOS	SCD	LOS
Tachypnea								
SCD	0.71**	–	–	–	–	–	–	–
LOS	–	0.53**	–	–	–	–	–	–
Hypoglycemia								
SCD	0.56**	–	0.49**	–	–	–	–	–
LOS	–	0.42*	–	0.11	–	–	–	–
Sepsis								
SCD	0.62**	–	0.64**	–	0.66**	–	–	–
LOS	–	0.10	–	0.15	–	0.35	–	–
Hypothermia								
SCD	0.39*	–	0.22	–	0.29	–	0.49**	–
LOS	–	0.33	–	0.57**	–	–0.02	–	–0.04

Weighted Pearson's correlations are presented. SCDs are SCDs for those infants with SCDs. Results were similar for unweighted Pearson's correlations and Spearman's correlations. NAS was not included in the correlations because of the high number of NICRs in Texas without any reported cases. –, not applicable.

* $P < .05$; ** $P < .01$.