Through the Looking Glass:
Examining APR-DRGs in the Pediatric Population
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Survey
Do you use the APR-DRG grouper when reviewing medical records?
Yes
No
Other
Learning Objectives

• At the completion of this educational activity, the learner will be able to:
  – Compare the difference between the APR-DRG and the MS-DRG systems
  – Discuss the impact of documentation on severity of illness and risk of mortality
  – Discuss the clinical application of the APR-DRG for common pediatric conditions
  – Identify common secondary conditions that impact severity of illness and risk of mortality

Medical University of South Carolina
Children’s Hospital

Medical University of South Carolina
• Major academic and tertiary patient referral center for all of South Carolina
• Three hospitals
  – University
  – Institute of Psychiatry
  – Children’s
• 709 beds
• Level one trauma center

Children’s Hospital
• 186 licensed beds
• Service lines
  – Peds ICU
  – Peds cardiology
  – Peds hospitalists
  – Peds hem-onc
  – Neonatal services
    – Level three nursery
    – Peds pulmonary
    – Peds neurology
    – Peds emergency dept.

Medical University of South Carolina
CDI Program

• Began in 2005 for adult services
  – Expanded in 2007
    • Additional staff and reviews
    • Currently 14 CDI nurses
• Pediatric CDI began January 2012
  – Two CDI nurses dedicated to pediatrics (2 FTE)
  – Concurrent reviews
  – Discharged with open queries
  – Coder-CDI discrepancies
  – Death reviews
Brief History of Development

Diagnosis Related Groups (DRG)

- 1960s: Designed and developed in late ’60s by Yale University to monitor quality of care and utilization of resources in the hospital setting
- 1970s: New Jersey first state to use DRGs in late ’70s
- 1982: Tax Equity and Fiscal Responsibility Act modified the Section 223 Medicare hospital reimbursement limits to include a case-mix adjustment based on DRGs
- 1983: Congress amended the Social Security Act to include a national DRG-based hospital prospective payment system for all Medicare patients
Evolution of the DRG

- 1983: Diagnosis Related Groups (DRG) implemented by CMS for the Inpatient Prospective Payment System (IPPS)
- 1987: All Patient DRG (AP-DRG) developed by 3M for non-Medicare discharges
- 1989: Refined DRG (R-DRG) developed to look at severity of illness in the Medicare population
- 1993: Severity DRG (S-DRG) CMS reevaluated the use of complications and comorbidities (CCs) within Medicare DRGs
- 2007: Medicare Severity DRG (MS-DRG) introduced a three-tier severity of illness structure (MCC-CC-No CC/MCC)
- 1990: All Patient Refined DRG (APR-DRG) developed by 3M Health Information Systems and the National Association of Children's Hospitals and Related Institutes (NACHRI)

Development of the All Patient Refined DRG

- Need to expand from consumption of resources:
  - Compares hospital resources and outcome measures
  - Evaluates mortality rates
  - Implementation and support of critical pathways
  - Identifies continuous quality improvement
  - Internal management and planning systems
  - Manages capitated payment arrangements
  - Accounts for all patient populations, including
    - Pediatrics
    - Obstetrics

APR-DRG Terminology

- APR-DRG: All Patient Refined Diagnosis Related Group. Accounts for all patients, all ages, including pediatrics.
- Severity of illness (SOI): Extent of physiologic decompensation or organ system loss of function.
- Risk of mortality (ROM): The likelihood of dying.
- Resource intensity: The relative volume and types of diagnostic, therapeutic, and bed services used in the management of a particular disease.
MS-DRG vs. APR-DRG

**MS-DRG**
- 345 base MS-DRGs
- Developed for the adult Medicare population
- Three levels of severity
  - w/o CC/MCC
  - w/CC
  - w/MCC
- Not all conditions have three levels of severity
- Possibility of 746 MS-DRG assignments
- Developed for reimbursement

**APR-DRG**
- 315 base APR-DRGs
- Age
  - Pediatrics
    - 0 to 17 years
  - Neonates
    - 0 to 28 days
- Every APR-DRG is divided into four SOI subclasses and four ROM subclasses
- Possibility of 1,262 APR-DRG assignments
- Developed for quality metrics along with reimbursement

APR-DRG Assignment

- Like MS-DRG assignment, principal diagnosis and surgical procedure will determine the base APR-DRG grouping
- One CC or MCC will “move” the MS-DRG assignment, whereas in the APR-DRG system, severity of illness (SOI) and risk of mortality (ROM) are determined by:
  - A complex 18-step algorithm
  - An accumulation effect
  - The impact of the secondary diagnoses on the principal diagnosis
  - The interaction of the secondary diagnoses
- Severity of illness (SOI) and risk of mortality (ROM)
  - Calculated separately
  - May be different

APR-DRG Resource Intensity

**APR-DRG three distinct descriptors:**

**Base APR-DRG**
- Principal diagnosis and procedure
- Secondary diagnoses

Secondary diagnoses will affect severity of illness and risk of mortality

<table>
<thead>
<tr>
<th>Severity of Illness (SOI) Subclass</th>
<th>Risk of Mortality (ROM) Subclass</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = Minor</td>
<td>1 = Minor</td>
</tr>
<tr>
<td>2 = Moderate</td>
<td>2 = Moderate</td>
</tr>
<tr>
<td>3 = Major</td>
<td>3 = Major</td>
</tr>
<tr>
<td>4 = Extreme</td>
<td>4 = Extreme</td>
</tr>
</tbody>
</table>
Risk of Mortality

- Process of determination of the risk of mortality level is similar to the severity of illness level assignment
- Risk of mortality levels are usually lower than the severity of illness levels for the same diagnosis
- In the pediatric population, the risk of mortality level of secondary diagnoses is often decreased
- Congenital anomalies may increase the risk of mortality in the neonatal period and through the first year of life

Factors Influencing the SOI and ROM

The combination of all secondary diagnoses and their interaction with the principal diagnosis, age, and procedures will drive the APR-DRG severity of illness and risk of mortality subclasses.

Reimbursement

- MS-DRG payer
  - Payment is fixed flat rate per case
  - Based on the MS-DRG relative weight x base rate
    - Medicare – except Maryland
    - Private insurance companies
- APR-DRG payer
  - Payment is dependent on the severity of illness (SOI) subclass
  - Based on APR-DRG SOI subclass weight x base rate
    - State Medicaid
    - Private insurance companies
APR-DRG Reimbursement

APR-DRG reimbursement is determined by the base APR-DRG and the severity of illness subclass multiplied by the hospital base rate.

<table>
<thead>
<tr>
<th>APR-DRG</th>
<th>Title</th>
<th>Severity of illness</th>
<th>Relative weight</th>
<th>Reimbursement</th>
<th>ALOS</th>
<th>GLOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>141 Asthma 1</td>
<td>0.3450</td>
<td>$2,000.86</td>
<td>2.10</td>
<td>1.82</td>
<td></td>
<td></td>
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<tr>
<td>141 Asthma 2</td>
<td>0.5100</td>
<td>$2,957.79</td>
<td>2.93</td>
<td>2.46</td>
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<td></td>
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<tr>
<td>141 Asthma 3</td>
<td>0.7777</td>
<td>$4,510.34</td>
<td>4.11</td>
<td>3.37</td>
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<td></td>
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<tr>
<td>141 Asthma 4</td>
<td>1.4124</td>
<td>$8,191.34</td>
<td>5.21</td>
<td>4.24</td>
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<td></td>
</tr>
</tbody>
</table>

APR-DRG SOI Levels

Every secondary diagnosis is assigned a severity of illness level.

<table>
<thead>
<tr>
<th>Secondary diagnoses</th>
<th>SOI level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCCs</td>
<td>3 or 4</td>
</tr>
<tr>
<td>CCs</td>
<td>2 or 3</td>
</tr>
<tr>
<td>Most non-CCs</td>
<td>1</td>
</tr>
<tr>
<td>Few non-CCs</td>
<td>2</td>
</tr>
</tbody>
</table>

Combination of secondary diagnosis SOI

<table>
<thead>
<tr>
<th>APR-DRG SOI level*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two SOI 4, or one SOI 4 and two SOI 3</td>
</tr>
<tr>
<td>Two SOI 3, or one SOI 3 and two SOI 2</td>
</tr>
<tr>
<td>One or more SOI 2</td>
</tr>
</tbody>
</table>

*APR-DRG rerouting logic, exclusions, and patient age may result in a different SOI level.

Impact SOI Using CC/MCCs

No APR-DRG grouper? No problem!
Utilize your knowledge of the CC/MCC diagnoses
Capturing two or more CC/MCCs will reflect a respectable SOI subclass

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two MCCs</td>
<td>If only one MCC is identified and clinical indicators of another MCC are present, query the physician for this second MCC</td>
</tr>
<tr>
<td>One MCC &amp; two CCs</td>
<td>If only one MCC is identified and there are no clinical indicators for a second MCC, search and query for up to two additional CCs</td>
</tr>
<tr>
<td>Two CCs</td>
<td>If there are no clinical indicators for any MCC, search and query for up to two additional CCs</td>
</tr>
</tbody>
</table>


Secondary Diagnoses That Potentially Impact Pediatric Severity of Illness

- ADHD
- Anxiety
- Anorexia
- Anorexia brain injury*
- Apnea
- Asperger’s
- Autism
- Autoimmune disease
- Awakening transplant status
- BMI (percentile)
- Bundle branch block
- Cyanide-Isokrines
- CKD unspecified
- Severe or 3
- Congenital disorders*
- Congenital syndromes*
- Dehydration
- Dependence on oxygen
- Dependence on ventilator
- Developmental delay*
- Dysphagia
- Failure to thrive
- Hypertension*
- Hypokalemia/hyperkalemia
- Hypotension
- Hypovolemia
- Intellectual disability
- Tachycardia
- Thrombocytopenia
- Thrush*
- Tracheotomy status
- Vitamin D deficiency
- Secondary diagnoses involving different body system = unrelated to principal
- Procedures
  - BIPAP/CPAP
  - Tube feedings
  - TPN
  - Mechanical ventilation
  - Excessive debilitation

*SOI impact may vary based on age or principal diagnosis.

APR-DRG Rerouting Logic

- Unique rerouting logic in the APR-DRG:
  - Utilizes the secondary diagnoses, procedures, and sometimes age along with the principal diagnosis to determine the reason for the hospitalization
  - Allocates clinically comparable patients together into similar APR-DRG groupings
  - Assigns the patients to the most appropriate APR-DRG
- Examples in the pediatric population:
  - Bronchopulmonary dysplasia (BPD)
  - Cystic fibrosis
  - Dehydration vs. gastroenteritis
  - RSV pneumonia
  - Neonates
**APR-DRG Rerouting Logic Examples**

**APR-DRG 118 Bronchitis & RSV Pneumonia**
- G01 2 GLO5 3.51
- G02 1 Wgt 1.3828
- 110.1 Pneumonia due to RSV

**APR-DRG 290 Non-Bacterial Gastroenteritis**
- G02 3 GLO5 3.21
- G04 2 Wgt 0.7.246
- 278.51 Dehydration
- 598.8 Viral gastroenteritis
- 598.7 General area of pediatric gastroenterology
- 776.89 Unclassified syndrome
- 776.2 Unclassifiable

**APR-DRG 121 WKS & Other Chronic Resp Diseases**
- G04 4 GLO5 5.13
- G06 3 Wgt 1.7696
- 782.1 Pneumonia due to tuberculosis
- 782.5 Chronic obstructive pulmonary disease
- 782.9 Other chronic lung disease
- 783.3 Primary pulmonary hypertension
- 784.5 Tobacco smoking

**APR-DRG 132 BPD & Other Chronic Resp Diseases**
- G04 6 GLO5 10.63
- G06 6 Wgt 2.6414
- 782.1 Pneumonia due to tuberculosis
- 773.0 Epicarditis as an electrocardiographic manifestation
- 773.25 Atrial fibrillation
- 781.4 Cerebrovascular disease
- 781.5 Severe protein-calorie malnutrition
- 781.74 Ventilator less than 96 hours

**APR-DRG Pediatric Considerations**

- **Sickle cell anemia**
  - APR-DRG 662 Sickle cell anemia with crisis
  - APR-DRG 663 Sickle cell anemia without crisis
- **Spinal fusion**
  - APR-DRG 303 Dorsal-lumbar fusion for curvature of the back
- **Osteomyelitis**
  - More serious condition with more implications for the pediatric population
  - Higher weighted in pediatrics population
- **Congenital heart disease**
  - Greater impact in first year of life
- **Developmental delay**
  - Impacts the severity of illness in the pediatric population
- **Burns**
  - Differentiates 3rd degree burns with increased severity of illness level
  - APR-DRG 841 Extensive 3rd degree burns with skin graft
  - APR-DRG 843 Extensive 3rd degree or full thickness burns without skin graft

**Intractable Epilepsy**

Intractable epilepsy can be recurring seizures which do not respond to usual treatment—i.e., a patient who has been under neurological care for approximately a year or more and is still experiencing seizures, despite correct adherence to prescribed antiseizptic medications, is considered to have intractable epilepsy. Intractable epilepsy must be clearly documented by the physician.

AHA Coding Clinic, Fourth Quarter 2005, p. 82
AHA Coding Clinic, Second Quarter 1992, pg. 8
Seizures With EEG Monitoring

H&P: Patient is a 6-year-old who presents for video EEG. She has had several recent breakthrough seizures on adequate doses of medication. She has had 3 seizures in the past week, all with right arm movement and progressing to eye blinking and unresponsiveness. She has had 2 grand mal seizures totaling with the last one in April.

Status Epilepticus

Physician must clearly state Reactive airway disease NOT Asthma

Children between 0 to 5 years are often diagnosed with reactive airway disease as asthma is difficult to diagnose

Acute bronchospasm or bronchospasm, not otherwise specified, are additional query opportunities
Sickle Cell Anemia

Sickle cell anemia with fever

Source of fever

Secondary diagnoses with severity of illness impact

Vitamin D deficiency

Supplements

Iron overload due to chronic transfusions

Avascular necrosis of hip (AVN)

Encounter for Chemotherapy

Impact of age on the ROM

<table>
<thead>
<tr>
<th>Age</th>
<th>SOI</th>
<th>ROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–1 years</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2–3 years</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Greater than 4 years</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

APR-DRG 693 Chemotherapy

<table>
<thead>
<tr>
<th>SOI</th>
<th>GLOS</th>
<th>ROM 2</th>
<th>Wgt</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.22</td>
<td>1.6893</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V58.11 Admit for chemotherapy
204.00 ALL without remission

Neutropenic fever

Bone Marrow Transplant Comparison

Autologous

APR-DRG 003 Bone Marrow Transplant

<table>
<thead>
<tr>
<th>SOI</th>
<th>GLOS</th>
<th>ROM 4</th>
<th>Wgt</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.98</td>
<td>10.5431</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

V58.11 Admit for chemotherapy
204.00 ALL without remission

Pancreatic transplant

Allogeneic

APR-DRG 003 Bone Marrow Transplant

<table>
<thead>
<tr>
<th>SOI</th>
<th>GLOS</th>
<th>ROM 4</th>
<th>Wgt</th>
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<tbody>
<tr>
<td>44.70</td>
<td>20.0119</td>
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</table>

V58.11 Admit for chemotherapy
204.00 ALL without remission

Pancreatic transplant
Child Abuse and Neglect

- Abuse and neglect codes are assigned only when the physician has confirmed and documented the abuse.
- Abuse and neglect codes are sequenced first followed by any associated injury or condition.
- Code the appropriate E-code as to the cause/perpetrator.
- If child neglect is determined to be accidental, code:
  - E904.0 Accident due to abandonment or neglect of infants and helpless person.

<table>
<thead>
<tr>
<th>ICD-9 code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>955.51</td>
<td>Child emotional abuse</td>
</tr>
<tr>
<td>955.52</td>
<td>Child neglect</td>
</tr>
<tr>
<td>955.53</td>
<td>Child sexual abuse</td>
</tr>
<tr>
<td>955.54</td>
<td>Child physical abuse</td>
</tr>
<tr>
<td>955.55</td>
<td>Shaken infant syndrome</td>
</tr>
</tbody>
</table>

Appendicitis

- Acute appendicitis
- Appendectomy
- Appendiceal abscess
- Ileus
- Acidosis
- Hyperkalemia
- Drainage of appendiceal abscess
- Hyperperistaltic ileus

Other Diagnoses Unique to Pediatrics

- Acute life-threatening event (ALTE)
- Foster care
- Hospitalism
- Prematurity status
  - Birth weight
- Constipation
  - Impaction
Newborn APR-DRGs

- Age is used to determine Major Diagnostic Category
  - Chapter 15 – Newborns and Other Neonates With Conditions Originating in the Perinatal Period
- Birth weight ranges used as framework
- Surgical APR-DRGs developed within each birth weight range
- Medical hierarchies created within each birth weight range
- Most newborns have V30.0x as principal diagnosis

Neonatal MS-DRG vs. APR-DRG

<table>
<thead>
<tr>
<th>MS-DRG</th>
<th>APR-DRG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seven MS-DRGs</td>
<td>28 APR-DRGs</td>
</tr>
<tr>
<td>Single DRGs</td>
<td>Four severity of illness (SOI) subclasses</td>
</tr>
<tr>
<td>No CCs or MCCs</td>
<td>Four risk of mortality (ROM) subclasses</td>
</tr>
<tr>
<td>Does not address birth weight</td>
<td>Seven birth weight ranges</td>
</tr>
<tr>
<td>No surgical DRGs</td>
<td>Gestational age</td>
</tr>
<tr>
<td></td>
<td>Surgical DRGs</td>
</tr>
</tbody>
</table>

Neonatal Case Study

<table>
<thead>
<tr>
<th>MS-DRG</th>
<th>APR-DRG</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS-DRG 793 Full Term Neonate With Major Problems</td>
<td>APR-DRG 630 Neonate With Birth Weight Greater Than 2499 gms With Major Cardiovascular Procedure</td>
</tr>
<tr>
<td>GLOS 4.7 Wgt 3.5299</td>
<td>GLOS 26.32 Wgt 12.2738</td>
</tr>
<tr>
<td>V30.00 Single live born in hospital</td>
<td>V30.00 Single live born in hospital</td>
</tr>
<tr>
<td>765.29 37 or more weeks gestation</td>
<td>765.29 37 or more weeks gestation</td>
</tr>
<tr>
<td>Tetralogy of Fallot</td>
<td>Tetralogy of Fallot</td>
</tr>
<tr>
<td>770.84 Respiratory failure newborn</td>
<td>770.84 Respiratory failure newborn</td>
</tr>
<tr>
<td>91.21 TOF repair</td>
<td>93.21 TOF repair</td>
</tr>
<tr>
<td>96.72 Vent greater than 96 hours</td>
<td>96.72 Vent greater than 96 hours</td>
</tr>
</tbody>
</table>
Chapter 15: Newborn (Perinatal) Guidelines

- Neonate/newborn 0–28 days at time of admission
  - 0–7 days
  - 8–14 days
  - 15 days and greater
- Neonatal codes may be used throughout the lifespan if the condition is still present
  - Bronchopulmonary dysplasia
  - Hypoxic-ischemic encephalopathy
  - Congenital anomalies
- Clinically significant diagnoses
  - Clinically evaluated; or
  - Therapeutically treated; or
  - Diagnostic procedure; or
  - Extended length of stay; or
  - Increased nursing care and/or monitoring; or
  - Implications for future healthcare needs

Chapter 15: Newborn (Perinatal) Guidelines (cont.)

- Principal diagnosis
  - In hospital birth
    - V30–V39 codes
  - Transferred after birth
    - The reason after study that occasioned the transfer
  - Neonatal codes should be sequenced as principal diagnosis (unless appropriate V30–V39 codes)
  - If there is not an appropriate neonatal code for the principal diagnosis, then sequence 779.89 Other specified condition originating in the perinatal period first, followed by the applicable condition code

Neonatal Coding Guidelines – Community-Acquired Conditions & Observation

- If the neonate has a condition that may be due to the birth process or community acquired and the physician does not determine etiology, then a neonatal code should be used
  - If the condition is documented as community acquired, a neonatal code is not used
- Observation codes (V29 codes) should be used when a healthy neonate has a suspected condition but after study the condition was ruled out
  - Only used for healthy neonates when no condition is found after study
  - Observation codes are not used if there are any signs or symptoms for the suspected condition
    - If signs or symptoms are present and the underlying etiology is not determined, then the signs or symptoms are coded
    - Observation codes may be sequenced as the principal diagnosis
APR-DRG 589
Neonate 500 gm or Gestational Age Less Than 24 Weeks

<table>
<thead>
<tr>
<th>APR-DRG</th>
<th>SOI</th>
<th>Relative weight</th>
<th>GLDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>589</td>
<td>1</td>
<td>14.1953</td>
<td>58.43</td>
</tr>
<tr>
<td>589</td>
<td>2</td>
<td>9.9573</td>
<td>50.41</td>
</tr>
<tr>
<td>589</td>
<td>3</td>
<td>7.1228</td>
<td>30.35</td>
</tr>
<tr>
<td>589</td>
<td>4</td>
<td>0.2421</td>
<td>2.65</td>
</tr>
</tbody>
</table>

APR-DRG 589
Neonate BWT < 500G or GA < 24 weeks

- There are no codes for non-viability
- By reversing the SOI and ROM scale, hospitals are able to more accurately demonstrate their risk of mortality as many of these neonates are considered non-viable and will likely die within a few days of being born
- Newborns greater than 750 gms will virtually always receive some therapeutic treatments if the goal is to preserve life (e.g., resp therapy, tube feedings); the absence of these treatments can imply that the neonate is receiving comfort care measures and their ROM is increased to extreme
- Since many of these neonates are comfort measures only, then a more accurate distribution of Medicaid reimbursement for hospital resources utilized
- Without this logic, most of these neonates would be a ROM of minor or moderate due to lack of codes for identifying non-viability

APR-DRG 583 Neonate With ECMO

- All ECMO patients are critically ill
- Neonatal ECMO patients are divided into those **with or without** the following major OR procedures:
  - Congenital diaphragmatic hernia repair
  - Cardiac surgery
- Neonates on ECMO without one of the major OR procedures above will have their severity of illness (SOI) subclass decreased by one
  - Potential maximum severity of illness (SOI):
    - Neonatal ECMO patients without surgery — SOI 3
    - Neonatal ECMO patients with surgery — SOI 4
Neonatal Secondary Diagnoses

- ABO incompatibility
- Acidosis of newborn
- Apnea of newborn
- Aspiration of newborn
- Bilious vomiting in newborn
- Congenital anomalies
- Congenital heart conditions
- CPAP
- Failure to thrive
- Feeding difficulties
- Gestational age
- Hypoglycemia
- Infant of diabetic mother
- Hypoxic ischemic encephalopathy (HIE)
- Mild moderate severe
- Infants of diabetic mother
- Intraventricular hemorrhage (IVH)
- Grade I-II-IV
- Maternal conditions affecting neonate
- Meconium aspiration with respiratory symptoms (MAS)
- Necrotizing enterocolitis (NEC)
- Stage I-2-3
- Observation to rule out sepsis (V codes)
- Other specified conditions in perinatal
- Persistent pulmonary hypertension (PPHN)
- Prematurity
- Respiratory distress syndrome (RDS)
- Sepsis
- Respiratory failure of newborn
- Sepsis of newborn
- Transient neonatal thrombocytopenia
- Transient tachypnea of newborn (TTN)
- Transitory ileus of newborn

Congenital Cardiac Anomalies

- Anomalies form during the embryonic stage of development, leading to distinct abnormalities
- It is appropriate to code a congenital anomaly that has been palliatively treated or not completely repaired and is still present
  - 745.3 Common ventricle
  - 746.1 Congenital tricuspid atresia and stenosis
  - 746.89 Double inlet left ventricle (ICD-10 Q20.4)
  - 745.11 Double outlet right ventricle
  - 746.7 Hypoplastic left heart syndrome
- Corrected cardiac anomalies
  - V13.65 Personal history of corrected congenital heart and circulatory
  - 745.12 Corrected transposition of great vessels

Neonatal Specificity

- Hypoxic ischemic encephalopathy
  - Mild — hyper-alertness, excessive reaction to stimuli, < 24 hrs
  - Moderate — lethargy, seizures, hypotonia, 2–14 days
  - Severe — stupor to coma, flaccidity, seizures, brain stem dysfunction
- Intraventricular hemorrhage
  - Grade I — bleeding in germinal matrix
  - Grade III — bleeding in ventricles without ventricular enlargement
  - Grade III — bleeding with ventricular enlargement
  - Grade IV — bleeding extends into brain around ventricles
- Necrotizing enterocolitis
  - Stage I — abdominal distention, bloody stools
  - Stage II — pneumatois
  - Stage III — pneumatois with perforation
Translate Diagnoses Into Appropriate Pediatric Diagnoses

- Chronic lung disease
  - Bronchopulmonary dysplasia
  - Interstitial pulmonary fibrosis of prematurity
- Diabetes
  - Secondary
  - Cystic fibrosis
  - Pituitary tumors
  - Steroids
- Hypertension
  - Secondary to
    - Renal disease
    - Coarctation of aorta
- Septic/hypovolemic shock
  - Early signs of decreased organ perfusion
    - Delayed capillary refill
    - Tachycardia
    - Cool extremities
    - Lethargy
    - Decreased urinary output
    - Hypoxia
  - May not be hypotensive

General Tips

Capture:
- All secondary diagnoses
- Highest level of specificity
- Present on admission

There are 14,567 ICD-9 codes

Query

- Patient is a 5-year-old admitted with status epilepticus with intractable seizures. Past medical history notes chronic lung disease, prematurity w/26 weeks gestation, and trach dependent. Can the “chronic lung disease” be further specified, e.g.?
  - Bronchopulmonary dysplasia (BPD)
  - Chronic lung disease originating in the perinatal period
  - Interstitial pulmonary fibrosis of prematurity
  - Other
  - Clinically undetermined
Alice in Wonderland Syndrome

- Alice in Wonderland syndrome
  - Also known as Todd's syndrome
- Childhood to late 20s
- Perceptual distortion of size and shape
- Associated with migraines, mono, and sleep onset
- ICD-9 293.89

Thank you. Questions?
Go ask Alice!
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In order to receive your continuing education certificate(s) for this program, you must complete the online evaluation. The link can be found in the continuing education section at the front of the program guide.