How CPT, ICD and DRG Coding Drive the Revenue Stream of Academic Pediatric Departments

Learning Objectives

- Apply our knowledge of clinical payment drivers to inform resource discussions and advocacy for academic pediatric departments

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2010 - 2016:
AAP, National Committee on Coding and Nomenclature

2010 - present:
Editorial Board, AAP Coding Publications

2011 – 2015:
AAP, CPT Alt Advisor to AMA

2022 - 2025:
President, Florida Association of Children's Hospitals (FACH)

2022 - 2024: Board Member, Fl Chapter AAP

2025 - present: TPS Payment Transformation

2025 - present :
Co-Chair, AMSPDC Pediatrics Reimbursement Workgroup

CPT: Current Procedural Terminology (AMA)

- Tells the payer what was done during the visit (Type of visit or procedure codes)
- Often what is used for productivity and compensation plans

ICD-10 CM: International Classification of Diseases, 10th edit (WHO)

- Why was it done? "Diagnosis codes" for billing the work
- Care quality and justification of services

DRG: Diagnosis-Related Group

- A case-mix complexity system to categorize inpatients with similar clinical diagnoses
- Hospital bills for the technical revenue separate from professional revenue

Academic Pediatric Financial Reality

- The wide variety of **administrative** and **organizational** structures in US Academic Medical Centers (AMCs) are frequently siloed, which has been characterized as the "corporatization" of academic medicine
- **Professional** and **financial** partnerships between the medical school in an AMC and its clinical enterprise (free standing vs embedded children's hospital and ambulatory services/Group practice) are highly varied

Academic Pediatric Financial Reality

- How reimbursement works in academic pediatrics
  - **DRGs** → Facility revenue
  - **CPT** → **RVUs** → Professional revenue
  - Accurate documentation drives both
  - Identify revenue optimization levers
  - Small improvements in coding accuracy create significant changes in **Contribution Margin (CM)** without increasing patient volume or services

Academic Pediatric Financial Reality

- High Medicaid payer mix (50–80%) and lower commercial payment rates
- Complex patient population
- High fixed teaching costs and research overhead
- Professional revenue alone rarely covers full faculty cost
- **Financial excellence** as a springboard for **education** and **discovery**

Total Department Revenue

Hospital Revenue & Funds Flow

- Payment = (Base Rate x DRG Weight) + Adjustments/ Supplement payments

+ Professional Fees & Revenue Cycle

- Payment = CPT → RVUs × Conversion Factor

+ Value based contracts

+ Grants & Discretionary Sources - external contracts

+ GME

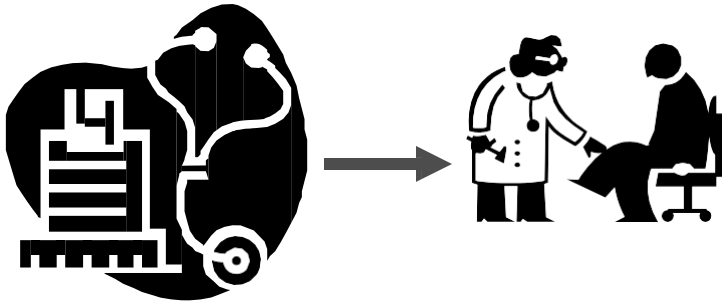
+ Philanthropy & Endowments

Why “Integrated CM” Matters in Pediatrics

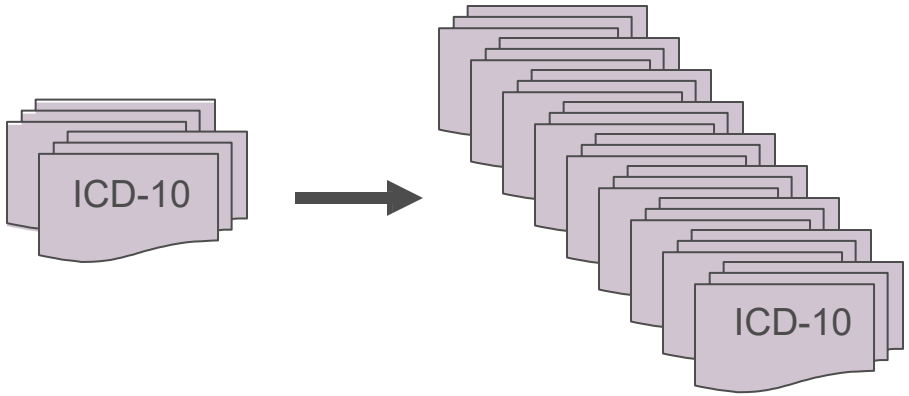
- Children’s services often have variable payment rates based on **Medicaid**
- But they generate:
  - NICU/ PICU/ Floor admissions and Surgical cases
  - Downstream Imaging, labs, Infusions/ pharmacy revenue
- Without integrating downstream revenue, leadership may **undervalue pediatrics**
- Integrated contribution margin is critical for:
  - Strategic planning and Service line investment decisions
  - Physician alignment
- This is a goal all departments should have

DRG FINANCIAL ANALYTICS

Why DRG?



A new classification system was needed, refined to shift the focus from **facility characteristics** to **patient characteristics**



Increased granularity on patient characteristics provided a better predictive model for **resource use** and **outcomes** than bed days

Medicare Severity Diagnosis Related Groups

MS-DRGs: Case-mix complexity system categorizes patients with similar clinical diagnoses

SOI (Severity of illness) adjusted for Comorbidities/ Complications (CC)

1) High with major CC - **2)** Moderate with CC - **3)** Low without CC

DRG-RW (Relative Weight): Numerical value reflecting an MS-DRG group compared to the average of all groups (**resource intensity, complexity** and **cost**)

AMLOS (Arithmetic Mean Length of Stay): Total # of hospital days for all patients in a DRG/ # of patients with that DRG (calculating **payment** and **utilization;** impacts **reputation**)

MS-DRG Payment Formula

- **DRG Payment** = **Base rate** × **DRG-RW**

  + Supplemental payments (IME + Outliers Payments + DSH + UPL)

  - **IME** = Indirect Medical Education adjustment (⬆ resident/bed ratio)
  - **Outlier Payments** = Cases incur exceptionally high costs, far exceeding standard MS-DRG
  - **DSH** = Disproportionate Share Hospital payment (Federal funds to states to compensate hospitals for the high costs of treating uninsured, low-income and Medicaid patients)
  - To qualify for **340B drug pricing**, a mix of low-income and Medicaid patients > **11.75%**
  - **Supplemental Payments**: Federal rule allows states to offset the fee-for-service rates

All Patients Refined DRGs

APR-DRGs

- Used by **Medicaid** programs and commercial payers
- To evaluate **resource utilization**, **patient outcomes** and **payment**

Unlike **3 levels** of MS-DRGs, **4 levels** of APR-DRGs provide greater granularity, offering a more detailed classification of patient **severity**

Payment Formula = Base Rate x APR-DRG RW
Example: Texas (base rate) $10,161 x 1.8 = **$18,290**

APR-DRG Assignment

Clinical Risk Stratification | *Mortality Prediction* | *Resource Planning*

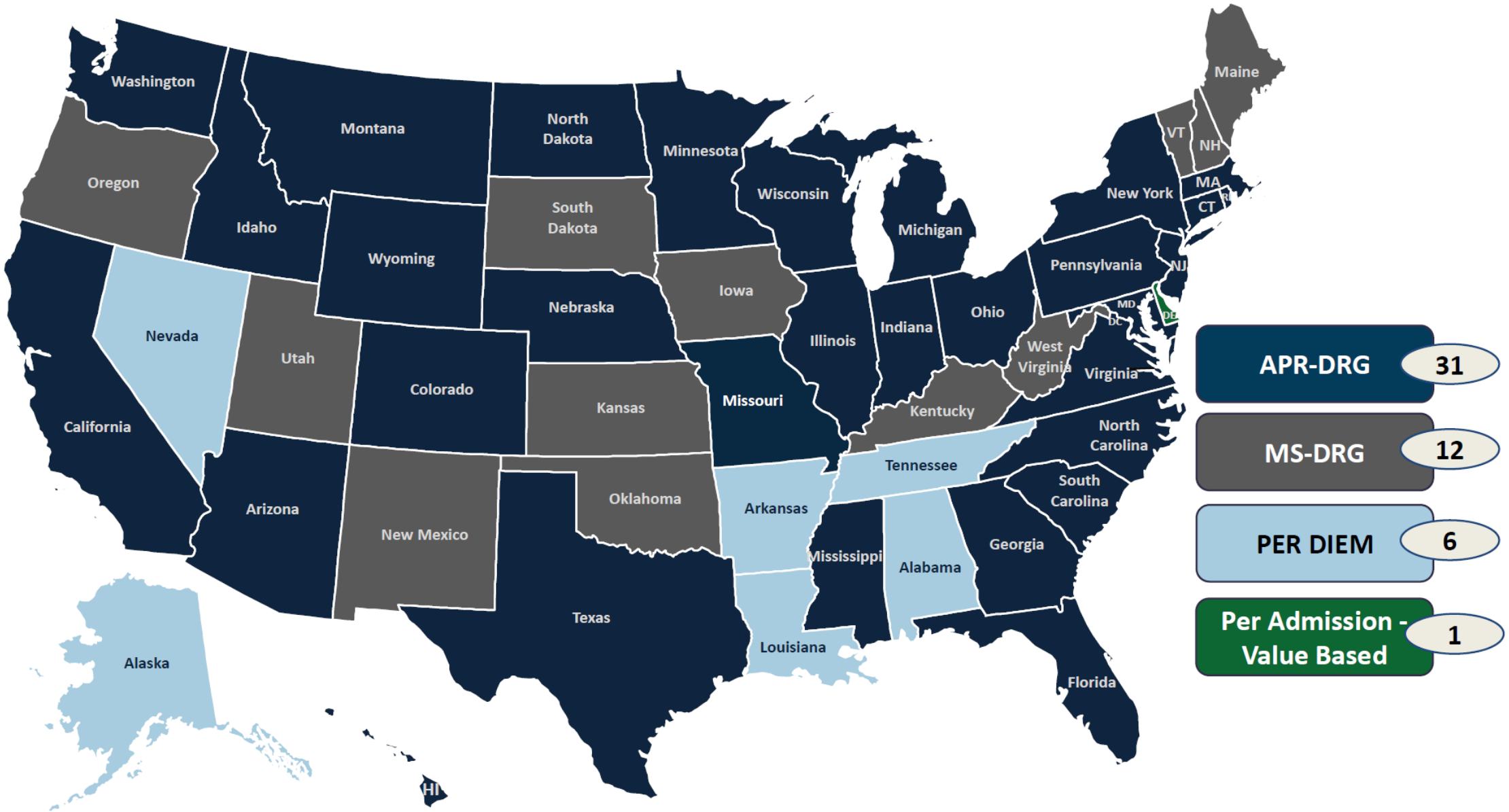
- Patient is first assigned to a base APR-DRG (**APR 139**, **Other Pneumonia**) which is divided into four **SOI levels** (3M classification) based on:
- **Comorbidities** (secondary diagnoses), **treatment/procedures**, and the interaction of **Complications,** which reflect the complexity and the intensity of care needed
- Each subclass has four possible severity assignment levels:
  1) Minor - low risk/cost **2) Moderate** **3) Major** - high **4) Extreme** - highest risk/cost
- **SOI** levels are often used alongside a separate four-level Risk of Mortality (**ROM)** score

MS-DRGs: Issues

Major Diagnostic Category: Newborn (MDC 15)

	MS-DRGs	APR-DRGs
Number of DRGs	7	28
Severity Levels	None	4 levels within each DRG
Recognition of Birth weight	No	Seven birth weight ranges
Separate Surgical DRGs	No	Yes

State Medicaid Payment Models



Pediatric APR-DRG Documentation Checklist

- **Definitive diagnosis** (not just symptoms)
- **Etiology + manifestation linkage** ("due to," "secondary to")
- **Severity** (mild/moderate/severe - acute/chronic)
- **Secondary diagnoses** (All comorbidities/ complex conditions)
- **Any organ dysfunction** (respiratory, renal, neuro, etc.)
- **Treatment intensity** (ventilation, ICU, pressors, procedures, etc.)

Case Mix Index (CMI)

- CMI = Total DRG RW / Total Discharges
  - Discharges = 2,000
  - Total DRG RW = 3,800
  - CMI = 1.9
  - Base rate (Texas) = $10,161 → Revenue = **38.61 M**
- Measures inpatient complexity
- Strategic financial metric
- Even a 0.1 increase in CMI can mean **millions** annually
- ⬆ CMI = 2.0 → Revenue = **40.64 M**

DOCUMENTATION IMPACT

- Documentation → Severity → DRG RW → **Revenue**
- CMI is strategic: Missing secondary diagnosis → **lower SOI**
- Respiratory Failure adds 0.1-0.135 RW
- Malnutrition adds 0.1-1.5 RW

The 4 High-Impact Documentation Habits

- **Diagnose, don't describe** → "Acute respiratory failure" not distress
- **Link cause + effect** → "Sepsis due to pneumonia"
- **Document severity** → Mild / Moderate / Severe + complications
- **Capture organ dysfunction** → Respiratory, renal, neuro, shock

What Drives APR-DRG payment?

- Improving documentation of **SOI** & **ROM**
  - Reflects true patient complexity
  - Impacts quality metrics (internal and external) & rankings
  - Accurate coding of comorbidities (like CHF or malnutrition) significantly impacts the assigned severity subclass and resulting reimbursement
    - 139-4 (**$21,145**) paying significantly more than 139-1 (**$5014**)
  - ***Accurate clinical storytelling***, not changing care, just documenting it correctly

APR-DRG Documentation Checklist

- **#1 Denial Driver** : Documentation doesn't clearly support ***clinical severity*** (SOI)(ROM), or **diagnoses/procedures**
- **Red flag for payers:**

  → Patient looks very sick (ICU, multiple interventions) but documentation is mild
- Biggest documentation gaps *or* ambiguity:
  - Accuracy of **problem lists, severity, comorbidity capture** (e.g., malnutrition, technology dependence, behavioral health complexity)
  - Even one missed condition can significantly lower severity

Pediatric-Specific Opportunities

- 2-year-old with vomiting, diarrhea, lethargy. Receiving IV fluids
- What's missing?
  - **Severe dehydration** with **metabolic acidosis** and **acute kidney injury, due to** viral gastroenteritis, **requiring** IV fluids
- Impact: ⬆ Higher **SOI** ⬆ More accurate **DRG RW**
- **Ask yourself:**
  - Did I capture **how sick** they are?
  - Did I document **why** the patient is this sick?
  - Did I document **everything**, I did?
  - Would a coder understand the full clinical picture **without asking me?**

DOCUMENTATION IMPACT

- NICU: Birthweight DRGs:
  - > 2499 g (640-1 vs 640-4) = DRG RW 0.1 vs 4.84
  - > 2499 g with major procedure (631-4) = DRG RW 25.24
  - Neonate with ECMO (583-1 vs 583-4) = DRG RW 28.22 vs 75.95
  - 1250 - 1499 g (608-1 vs 608-4) = DRG RW 3.04 vs 16
  - Difference (608-1 vs 608-4): 13 × $10,161 = $132,093 / case

- PICU: Septicemia (720) without vs with organ failure
  - 720-1 vs 720-4 = DRG RW 0.64 vs 3.75 ((LOS 3.4 vs 9.8)
  - Difference = 3.11
  - 3.11 × $10,161 = $31,600 per case

CPT & PROFESSIONAL REVENUE ANALYTICS

CPT Revenue Formula

- (Work Relative Value Unit + Practice Expense RVU + Malpractice RVU) x Geographic Practice Cost Index
- x **Payor Specific** Conversion Factor established through contracts and negotiations
- Applies to inpatient and outpatient services
- Non-Facility or Facility Practice expense RVU
- 2026 **Medicare** Conversion Factor = $ 33.57 Alternate Payment Model / $33.40 (↑3.26%)

CPT Revenue Formula

- 99221 (Total RVU 2.23) vs 99222 (T RVU 3.5) vs 99223 (T RVU 4.68)
- 99222 instead of 99223 = 1.18 RVUs less
- 1.18 RVUs × Medicare CF $33.40= $39.41 per encounter less
- If 2,000 admissions/year: $ 39.41 × 2,000 = **$78,820 lost**

Critical Care Billing

- 99291 = 4.5 W RVU/ 5.96 (Facility T RVU) / 9.25 (NF T RVU)
- 99292 = 2.25 W RVU/ 3.0 (Facility T RVU) / 4.01 (NF T RVU)
- 5.96 × $33.40 = $199 per encounter (plus 99292 plus add on codes)
- Underbilling 500 cases: $199 × 500 = **$99,500 lost**
- Time-based documentation – Can be billed by any specialty

W = work; T = total; NF = non-facility

FULL DEPARTMENT FINANCIAL MODEL

Revenue Cycle Optimization

- ICD-10 Diagnosis Coding ⇨ Drives DRG assignment (Specificity matters)
- Provider documentation ⇨ Coding review ⇨ Claim submission ⇨ **Payment**
- Clinical Documentation Improvement (CDI)
- Concurrent review ⇨ Physician queries
- Revenue protection

Sample Pediatric Department Contribution to Clinical Revenue

50 faculty - 2,000 admissions - 50,000 clinic visits

- Inpatient Professional Revenue
  - Average Total RVU/admission = 5
  - 5 × $33.40 × 2,000 = **$334,400**
- Inpatient Hospital Revenue
  - Case Mix Index (CMI) = 2.0
  - Texas Base rate = **$10,161**
  - Revenue: 2.0 × $10,161 × 2,000 = **$40.64 M**
- Outpatient Professional Revenue
  - 2.5 T RVU/visit (99214) x 40,000 visits = **$3.34 M**
  - 5.3 T RVU/visit (99204) x 10,000 visits = **$1.77 M**
- Total Clinical Revenue
  - Facility: **$40.64 M**
  - Professional (inpatient & outpatient): **$5.44 M**
  - Total ≈ **$46.08 M**

Revenue Levers Ranked by Impact

- **CMI Optimization**
- E/M Leveling
- Avoidable Denial Reduction
- Risk Adjustment Capture

- **Audit Current Performance**
- Educate Faculty
- Align Incentives
- Monitor **Key Metrics** monthly
  - CMI trend
  - wRVU/ billable cFTE
  - Avoidable Denial %
  - Net revenue per discharge (IP)
  - Net revenue per billed visit (OP)

OPTIMIZATION SCENARIOS

- Increase CMI by 0.1 ⇨ 0.1 × $10,161 × 2,000 = **$2.032 M**
- Improve E/M accuracy by 0.5 RVU/visit ⇨ 0.5 × $33.40 × 50,000 = **$835,000**
- Reduce Denials by 3% ⇨ 3% of $46.08 M = **$1.382 M**
- Combined Impact: $2.032 M + $0.835 M + $1.382 M = **$4.249 M**

Coding Accuracy

Protects Revenue

- Ensures all services performed and complexity are fully captured and billed correctly
- Reduces coding errors or under coding and missed reimbursement
- **Result:** Higher **revenue capture** without increasing patient volume

Reduces Financial Waste

- Fewer claim denials and staff time spent correcting and resubmitting claims
- Faster reimbursement and improved cash flow

Result: Lower **operational costs** and improved efficiency

Strengthens Data Accuracy and Compliance

- Accurate reporting of case complexity and service volume
- Reduced audit and regulatory risk

Result: Improved **budgeting, staffing, and strategic planning**

Governance Model

- **Finance** + **CDI** + **Physician Leadership** alignment
- Monitor coding acuity of faculty (especially newly trained or joined)
- Small documentation shifts → multi-million impact
- Academic pediatrics especially **sensitive to CMI**
- Professional revenue often under-optimized
- Attention to local base rates and **Medicaid** structures/ variation by state
- Embed **prior authorization** checkpoints and evidence citations to support medical necessity

CDI = clinical documentation improvement; CMI = case mix index

Compliance Considerations

- Technology & AI in Coding
  - Computer-assisted coding
  - Predictive analytics
- Compliance Considerations
  - Upcoding risk
  - Audit exposure
  - Governance controls

Thank you! Questions?

Appendix

The following slides were not presented during the webinar and are provided as additional resources.

Documentation habits to avoid APR DRG denials

1. Vague or Non-Specific Diagnoses
   - Avoid: “Sepsis” without source or organ dysfunction
   - Why: APR-DRG relies heavily on specificity to assign severity levels.
   - Clearly define **condition, cause, and acuity**
     - e.g., “Sepsis due to pneumonia with acute hypoxic respiratory failure”

2. Inconsistent Documentation Across the Chart
   - Avoid: ED says “sepsis,” H&P says “infection,” discharge summary says “SIRS”
   - Why: Coders must reconcile inconsistencies → often downcoded or denied.
   - **Final diagnosis matches clinical picture** and is consistent in discharge summary

Documentation habits to avoid APR DRG denials

3. Missing Linkage (Cause-and-Effect Relationships)

- Avoid: Listing conditions separately without linking them
  - "Diabetes" and "foot ulcer" (but not "diabetic foot ulcer")
- Why: APR-DRG logic needs **causal relationships** to capture CC/MCC
- **Use linking language**: "due to," "secondary to," "associated with"

4. Not Documenting Severity or Acuity

- Avoid: "Heart failure" (no type or acuity) or "Anemia" (no cause or severity)
- Why: **Severity** drives APR-DRG subclass (SOI/ROM).
- **Specify**: Acute vs chronic, Type (systolic, diastolic, hypoxic, etc.), Grade

Documentation habits to avoid APR DRG denials

5 . Failure to Capture All Relevant Comorbidities

- Avoid: Omitting chronic conditions affecting care (malnutrition, obesity, CKD)
- Why: Missing comorbidities lowers SOI/ROM → lower reimbursement/ denial.
- Document all **evaluated, monitored, or treated** conditions

6. Copy-Paste Without Clinical Validation

- Avoid: Carrying forward diagnoses that are no longer relevant or not supported
- Why: Triggers audits and denials for “unsupported diagnoses”
- Update problem list **daily** and remove or clarify outdated diagnoses

Documentation habits to avoid APR-DRG denials

7. Not Documenting Clinical Indicators
   - Avoid: Diagnoses without supporting evidence
   - Why: Payers check if diagnosis is clinically justified.
   - **Include Labs** (e.g., lactate for sepsis), Imaging, Vitals, Treatment (e.g., oxygen, antibiotics)

8. Poor Discharge Summary Documentation
   - Avoid: Missing final diagnoses
   - Not reflecting complications treated during stay
   - Why: Discharge summary is the primary coding document
   - Ensure it **includes** Final diagnoses, Complications, Procedures and Clinical course

Documentation habits to avoid APR DRG denials

9. Overuse of “Rule Out,” “Possible,” or “Likely”

- Avoid: Leaving uncertainty unresolved at discharge
- Why: In inpatient coding, uncertain diagnoses can be coded but must be clearly supported and consistently documented.
- **Clarify final status**: Confirmed, ruled out, or still suspected

10 Ignoring Queries from CDI/Coding Teams

- Avoid: Delayed or incomplete responses to queries
- Why: Missed clarification = lost specificity = denial risk
- **Respond promptly and clearly**, as opportunity to strengthen documentation

Supplemental Payments

- States can make Supplemental Payments **(SP)** to providers based on the difference between base FFS payments to a class of providers (in the aggregate) and an SP specified in regulation.
- For most **institutional providers**, such as hospitals and nursing facilities, the SP is defined as a reasonable estimate of the amount that would have been paid for the same service under **Medicare payment** principles
- For **physician services**, the SP is a reasonable estimate of the **average commercial rate** that the provider receives, which is typically higher than Medicare rates

Supplemental Payments

- **Florida** Medicaid's (UPL) program for physicians primarily provides supplemental payments to **Academic faculty physicians** (specifically medical school faculty practice plans) and certain **government-employed** physicians
- **Texas** Incentives for Physicians and Professional Services (TIPPS) program is a Medicaid State directed payment (SDP) supporting **Academic and Non-academic** physicians
- **California**, Supplemental Payments, specifically structured as the Physician Non-Physician Practitioner (PNPP) Program, to bridge the gap between Medi-Cal (FFS) base payments and Medicare, available for **both Academic and Non-academic physicians**, with **government** affiliation
- **Virginia's** Medicaid Supplemental Upper Payment Limit (UPL) program provides enhanced payments to qualifying physician practices, often affiliated with **public or private Academic health systems**