Using Artificial Intelligence to Enhance Clinical Documentation Improvement

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Cerner Intelligence
How do we define Intelligence?
Transform Data into Health Care Intelligence

- Descriptive
- Diagnostic
- Predictive
- Prescriptive
Reduce Cognitive Load on Health Care Teams

Data Capture
- Voice
- Image
- Video
- Sensors

AI Transformations
- Speech-to-Text
- NLP/NLU
- Text-to-Speech
- Image Recognition
- Skeletal Tracking

Semantic Interoperability
- Ontologies
- Mappings
- Terminologies

Cerner Applications
- Charge Assist
- Chart Assist
- Virtual Scribe
- Voice Assist
# Hospital Revenue Cycle in 2 Minutes or Less

<table>
<thead>
<tr>
<th>Register and Financially Qualify the Patient</th>
<th>Deliver and Document Appropriate Care</th>
<th>Bill and Manage Receivables</th>
<th>Governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Register Patient</td>
<td>• Document Encounter Thoroughly</td>
<td>• Submit Claims</td>
<td>• Utilization Review Committee (for denials review)</td>
</tr>
<tr>
<td>• Financial Clearance (check for medical necessity of admission)</td>
<td>• Code Documentation / Fill Out Charge Capture Thoroughly</td>
<td>• Bill Patients As Needed</td>
<td>• Medical Executive Committee (for quarterly review)</td>
</tr>
<tr>
<td>• Patient Access/Eligibility (check insurance coverage or self-pay status)</td>
<td>• Ensure Appropriate Utilization of Services (medical necessity)</td>
<td>• Follow-up with DNFB (discharged not final billed)</td>
<td>• Office of the CFO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Appeal Denied Claims</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Follow-up with Self-Pay Patients (accounts receivables (AR))</td>
<td></td>
</tr>
</tbody>
</table>
## Documentation and Coding

### Deliver and Document Appropriate Care

- **Document Encounter Thoroughly**
- **Code Documentation / Fill Out Charge Capture Thoroughly**
- **Ensure Appropriate Utilization of Services** *(medical necessity)*

<table>
<thead>
<tr>
<th>Clinicians</th>
<th>• Document diagnoses and procedures in the chart as thoroughly as possible</th>
</tr>
</thead>
</table>
| Clinical Documentation Specialists (CDS) | • Sample 30-100% of charts  
• Prompt clinicians to fill in missing details |
| Coders | • Assign the right diagnosis codes (ICD-10-CM)  
• Select a principal diagnosis  
• Identify and assign the right procedure codes (ICD-10-PCS)  
• Identify the right Diagnosis Related Group (DRG):  
  • Medicare Severity Diagnosis Related Group (MS-DRG)  
  • All Patient Diagnosis Related Group (AP-DRG)  
  • All Patient Refined Diagnosis Related Group (APR-DRG) |
## Documentation and Coding

### Top Five Clinical Documentation Issues

<table>
<thead>
<tr>
<th>Condition</th>
<th>Common Documentation Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive Heart Failure</td>
<td>- Clarification needed (e.g., acute vs. chronic, systolic vs. diastolic, specifying right vs. left ventricular dysfunction)</td>
</tr>
<tr>
<td>Sepsis</td>
<td>- Often unclear whether sepsis, severe sepsis, SIRS&lt;sup&gt;1&lt;/sup&gt;, bacteremia, UTI, etc</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>- Clarification needed (e.g., acute vs. chronic)</td>
</tr>
<tr>
<td></td>
<td>- Lack of specificity (renal insufficiency&quot; vs. “failure,” specify stage of kidney disease)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>- Failure to document cause (e.g., causative organism, aspiration)</td>
</tr>
<tr>
<td></td>
<td>- Need to specify simple vs. complex</td>
</tr>
<tr>
<td>Respiratory Failure</td>
<td>- Clarification needed (e.g., acute vs. chronic)</td>
</tr>
<tr>
<td></td>
<td>- Lack of specificity (respiratory “distress” vs. “insufficiency” vs. “failure”)</td>
</tr>
</tbody>
</table>

### Financial Impact

- **DRG 684:**
  - (Renal Failure without Major Complications and Comorbidities)
  - $3,609.01
- **DRG 682:**
  - (Renal Failure with Major Complications and Comorbidities)
  - $9,240.73

**Net Revenue Impact:** $5,631.72

### Deliver and Document Appropriate Care

- Document Encounter Thoroughly
- Code Documentation / Fill Out Charge Capture Thoroughly
- Ensure Appropriate Utilization of Services (medical necessity)
The Progression of Documentation and Coding

**Documentation and Coding - Past**

<table>
<thead>
<tr>
<th>Days</th>
<th>Test Results/Reports</th>
<th>Dictation/Note Entry</th>
<th>Coding and DRG (if required) Finalized for Billing</th>
<th>Retrospective Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admit</td>
<td>Services Provided/Care Documented</td>
<td></td>
<td></td>
<td>Abstracing and Coding</td>
</tr>
<tr>
<td>Discharge</td>
<td></td>
<td>Manual Data Abstraction for Quality, Core Measures, Registries, Research, etc.</td>
<td></td>
<td>80%</td>
</tr>
<tr>
<td>Days</td>
<td></td>
<td></td>
<td></td>
<td>Issues:</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Volumes of documents requiring manual review</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Documentation may not have sufficient detail -&gt; query</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Edits run after discharge or coding may require re-review</td>
</tr>
</tbody>
</table>

**Value Gained from then to now:**

- Leverage AI to *reduce manual review* of documentation and coding
- Reduce risk of denied claims and "discharged, not final billed" (DNFB)
- CDS staff shifts from "reviewing all" to *exception-based review* of complex claims

**Documentation and Coding - Future**

<table>
<thead>
<tr>
<th>Days</th>
<th>Test Results/Reports</th>
<th>Dictation/Note Entry</th>
<th>Coding and DRG (if required) Finalized for Billing</th>
<th>Retrospective Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admit</td>
<td>Services Provided/Care Documented</td>
<td></td>
<td></td>
<td>Automated Query (as needed) Coding Finalized for Billing</td>
</tr>
<tr>
<td>Discharge</td>
<td></td>
<td>Automated Data Abstraction Automated Clarification Preliminary Coding Working DRG Assigned</td>
<td></td>
<td>20%</td>
</tr>
</tbody>
</table>

CAPD shifts coding-critical documentation into clinical workflows prior to discharge.

Staff focus shifts to exception-based coding on complex claims.
The Future of Documentation and Coding

Gartner Hype Cycle 2017

- Peak of Inflated Expectations
- Trough of Disillusionment
- Plateau of Productivity
- Innovation Trigger
- CAPD
- CDI
- CAC
- Slope of Enlightenment

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# The Future of Documentation and Coding

<table>
<thead>
<tr>
<th>Computer Assisted Coding (CAC)</th>
<th>Clinical Documentation Improvement (CDI)</th>
<th>Computer Assisted Physician Documentation (CAPD)</th>
</tr>
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</table>
| • Workflow management for the coder  
• Encoder tool to manually lookup correct codes in a “tree” structure  
• Intelligence to suggest possible codes  
• Audit trail to track selected codes and supporting details  
• Grouper tool to map diagnosis and procedure codes to the right DRG | • Workflow management for the clinical documentation specialist (CDS)  
• Tool to look for improved documentation opportunities in each chart  
• Ability for CDS team to query clinicians for more specificity  
• Concurrent (during the patient visit) and retrospective (post-discharge) queries  
• Reports to track clinician responses and calculate financial impact | • AI-generated opportunities for more specificity  
• Generally concurrent (during the patient visit) queries  
• Real-time or near real-time queries to the clinician |
## History of Cerner applying AI to CDI

### Why
- Reduce the burden on all caregivers in a way that feels natural to the physician

### KPIs
- Increase patient charts reviewed
- Accurate coding

### Foundation
- Cerner NLP (Natural Language Processing) to identify concepts and terms in documentation
- Cerner Millennium provides structured clinical data and results
- Ontology standardizes and gives these concepts meaning
- Top conditions
Principle 1: No Black Box

Not a black box – need to trust the system

- Open with our content and algorithms
- Detail Panel
  - Clinical Indicators
  - Signs, Symptoms, Risk Factors
  - Treatment
Principle 2: Leave the medical decisions to the clinician

- Allow clinicians to accept or dismiss any recommendations
- Provide all our reasons for making a recommendation
- Use language that isn’t commanding but suggestive (potential diagnosis vs. place this diagnosis)
- Present objective data, where it was found so clinician’s can verify and decide
- “Consider Adding”
Principle 3: Clinical Validation

- Proof that the patient truly had it or that it was treated

### Unable to find Clinical Support for Documented Diagnosis

**Validate Documented Diagnosis**

**Diagnosis**
- Acute Renal Failure

**Indicators Not Found**

**Signs, Symptoms, and Risk Factors**
- Same as Indicators found.

**Treatment**
- Diuretics was ordered. Normal saline infusion was ordered. Serum creatinine levels are being monitored.
  - Sodium Chloride 0.9% 0
  - Creatinine LVI 1.2 mg/dL
  - Furosemide 20 mg
  - Creatinine LVI 2.3 mg/dL
Principle 4: Inherent in the workflow

- Inherent in the workflow to minimize cognitive load on the clinician
- As they are doing their note, they can see these opportunities, click on the detail panel to view the evidence, hyperlink, then decide
Principle 5: Customization allowances

- Allow some level of customization while still trying to reduce variations in care
- Ex. Serum sodium level can be customized
Principle 6: Silent / Evaluation Mode

- Run silently/evaluation mode
- Test drive
- Does it meet expectations or show value?
Summary

1. Defined healthcare intelligence

2. Reviewed hospital revenue cycle

3. Discussed the value of clinical documentation improvement

4. Explored the future of documentation and coding

5. Learned 6 principles of responsibly applying AI to documentation and coding
Q&A