

WHITE PAPER

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Summary: This paper defines a recommended process for medical record review. This includes the important first step of defining the “why” behind the review, and marrying the review outcome to organizational goals.

Medical record review is perhaps the core responsibility of the CDI professional. Although the numbers vary by facility, CDI specialists review an average of 16–24 patient charts daily, a task that comprises the bulk of their workday (ACDIS, 2016).¹ During the review, CDI professionals comb the chart for incomplete, imprecise, illegible, conflicting, or absent documentation of diagnoses, procedures, and treatments, as well as supporting clinical indicators. Their goal is to cultivate a medical record that stands alone as an accurate story of a patient encounter, providing a full picture of the patient’s illness and record of treatment. A complete record allows for continuity of care, reliable collection of mortality and morbidity data, quality statistics, and accurate reimbursement.

In their review of the medical record, CDI professionals aim to reconstruct the patient story from admission to discharge by examining, understanding, and synthesizing many puzzle pieces from disparate systems and people. This process requires considerable clinical acumen, critical thinking akin to detective work, and knowledge of coding guidelines and quality measure requirements. In a world with finite resources, it also requires an efficient, effective workflow.

This paper defines a recommended process for medical record review. This includes the important first step of defining the “why” behind the review, and marrying the review outcome to organizational goals. The paper also describes a recommended step-by-step review process, starting with emergency department documentation and continuing to the history and physical, progress notes, and query and follow-up. This paper defines and differentiates initial and subsequent reviews and offers suggestions for capturing not just physicians’ critical thinking, but that of the CDI specialists too. It also discusses reconciliation of coded data, advanced chart review techniques, and the present state of assistive technology.

1. The majority (53%) of respondents to ACDIS’ 2016 CDI Productivity Survey indicated that they conduct 6–10 new reviews each day, with 32% reporting that they conduct 11–15 new reviews each day. Survey results indicated an interesting split of daily re-reviews, with approximately one-third of respondents conducting 6–10 re-reviews per day and one-third conducting 11–15 re-reviews per day.

Aligning record reviews to organizational goals

One of the greatest challenges to identifying an optimal, universal CDI record review process is contending with differing organizational CDI scopes of work. While this paper offers a standard review process, differing organizational end goals may require different review emphases.

Today, CDI has evolved. It's no longer focused solely on MS-DRGs, but takes a holistic view of all aspects of patient comorbidities, including the impact on reporting of quality measures and patient conditions.

Many CDI programs began with a goal of DRG optimization. Under this model, CDI specialists typically reviewed the record concurrent with the patient's stay. Reviews terminated when the DRG was "optimized" with documentation of the appropriate principal diagnosis. Unfortunately, this approach could lead to busy clinicians missing or omitting comorbidities in the documentation, resulting in an inaccurate patient classification in the DRG system.

Today, CDI has evolved. It's no longer focused solely on MS-DRGs, but takes a holistic view of all aspects of patient comorbidities, including the impact on reporting of quality measures and patient conditions. In today's model, CDI reviewers examine cases throughout an encounter and query for documentation of all comorbid conditions, regardless of whether the DRG has already been optimized. This model encourages providers to document all conditions being monitored and treated, thereby ensuring accurate reimbursement for MS-DRG payers and helping prevent denials that stem from the removal of a sole CC/MCC. The model also allows for some risk adjustment that may impact APR-DRG payers and specific quality reporting agency measures. CDI specialists operating in APR-DRG environments typically review records and query for diagnoses that impact APR-DRG assignment and severity of illness (SOI) and risk of mortality (ROM) metrics, which drive payment and related quality measures. Programs that review Value-Based Purchasing quality measures focus on principal diagnosis assignment, and on diagnoses (primarily chronic conditions) that drive risk adjustment for these measures.

Ultimately, CDI specialists should review all records, regardless of payer, to ensure documentation integrity across all patient populations.

CDI review processes may also focus on some combination of the following objectives:

- Patient Safety Indicators (PSI)
- Hospital-acquired conditions (HAC)
- Mortality risk: Observed vs. expected metrics
- Specific populations (by payer, service line, primary diagnosis, mortalities)

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- Hierarchical Condition Categories (HCC)
- Readmissions and social determinants of health
- Length of stay (LOS): Observed vs. expected metrics, which can also be risk-adjusted

Setting a clear goal for CDI record review requires knowledge of reimbursement, quality measures, and other key targets. But it also requires understanding your organization's overall mission and goals. Without this concordance, a CDI program may find itself undervalued by hospital leadership or fail to meet organizational needs. For example, initiating SOI/ROM-focused reviews when hospital leadership is focused on Value-Based Purchasing metrics may result in outcomes misaligned with institutional goals.

Merging organizational goals with CDI workflows can be difficult, as it requires access to leadership and negotiation with the competing interests of other departments. As a result, programs often omit this essential step. However, successful alignment can ensure that the organization's priorities are reflected in the CDI program's outcomes, granting the program and its work substantial added value. Communication is key.

A baseline CDI record review is a concurrent review of an inpatient medical record in which the CDI specialist attempts to abstract key information for the purposes of quality measurement, compliant coding, and appropriate reimbursement.

Principles of record review

A baseline CDI record review is a concurrent review of an inpatient medical record in which the CDI specialist attempts to abstract key information for the purposes of quality measurement, compliant coding, and appropriate reimbursement. This process ensures that all conditions being monitored and treated during the encounter are appropriately identified in provider documentation.

- **Quality measurement** aspects of the review include capturing documentation that may need further clarification, require clinical validation, or impact organizational quality measures, patient care and outcomes, and public reporting.
- **Compliant coding** reviews identify diagnoses, conditions, and key findings that need further clarification for acuity (acute, subacute, chronic), specificity (type, degree, level), or clinical validation and/or support in order to be properly reported in coded data. This includes present on admission (POA) status. During the review, CDI specialists must adhere to organizational bylaws, Uniform Hospital Discharge Data Set (UHDDS) guidelines, ICD-10-CM Official Guidelines for Coding and Reporting, and internal documentation and coding policies.

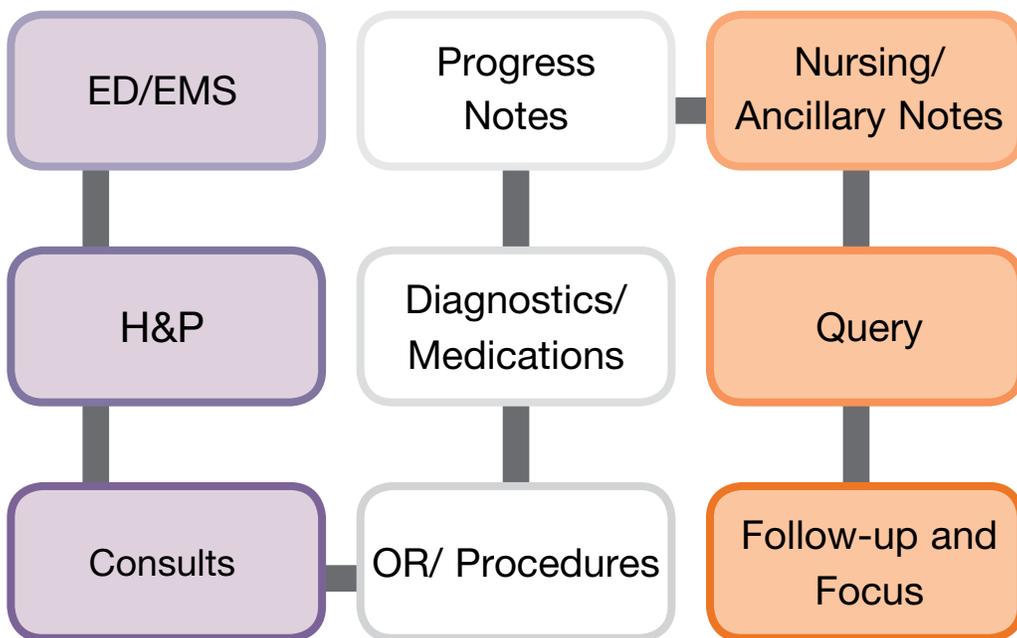
- **Appropriate reimbursement** comes from the review’s capture of severity, clinical validation, coding accuracy, medical necessity, and quality outcomes.

The record review should also track communication among CDI and coding professionals, if applicable, for efficiency, clarity, and understanding of the review and key findings (this topic is covered later in the paper).

Concurrent CDI review captures the essence of the patient’s admission and articulates the comorbid conditions being monitored and treated throughout the inpatient stay. During this process, the CDI specialist must clinically validate the stated conditions, querying for those conditions that are unstated but clinically supported, or stated but clinically unsupported.

When should a record review begin? Typically, reviews begin 24–48 hours after admission and/or initial assessments are completed. A good rule of thumb is to review a record when there is enough information on which to base a query (e.g., after the history and physical is completed, and initial diagnostic testing is performed).

Following is an example of a chart review workflow:



ED/EMS notes

The process of record review begins with the emergency department (ED) notes, or notes from emergency medical services (EMS). Here, CDI specialists encounter a great deal of clinical evidence for POA conditions, even if not initially documented in the medical record. ED diagnoses may be final-coded, but like all diagnoses, they must be clearly documented, be clinically supported, and meet the UHDDS definition of a secondary diagnosis.

Some of the elements that CDI specialists should consider in their review include the following:

- **Vitals—initial:** Review the initial vital signs as these provide a baseline of medical necessity, clinical support and POA status for conditions, and evidence of disease processes (e.g., SIRS, sepsis, infections, respiratory failure). Compare initial and subsequent vital sign assessments for variation. Note any therapeutic interventions that may impact the vital signs.
- **Chief complaint:** The chief complaint usually relates to the principal diagnosis. Review for information from the patient or family that may indicate a potential disease or condition (e.g., encephalopathy, malnutrition, stroke). This information may shed light on confusion or behavioral disturbances. Review nutrition status documentation for intake, fluid consumption, and any noted weight loss or gain over time. In addition, there may be documentation of a fall. If so, review to see how the fall occurred, what the patient was doing prior, and where the fall occurred in order to capture coding specificity. Look for the underlying condition causing the fall, if appropriate. Seek to identify causative factors and relationships among medical conditions that support identification of the principal diagnosis.
- **Relevant physical findings:** Obtain diagnosis validation via assessment of the clinical findings that support the conditions being monitored and treated. Common findings are for pressure injuries, respiratory failure, and malnutrition. Be vigilant for contradictory findings (e.g., diagnosis of sepsis with a general description of “non-toxic”).
- **Relevant past medical history:** Capture appropriate chronic conditions that are relevant to this admission. Review the medications on admission and verify the corresponding diagnosis. If the patient presented on antibiotics or another ongoing treatment, is there documentation of a corresponding condition (e.g., urinary tract infection, pneumonia)? Review for recent surgeries, procedures, or complications that may have

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contributed to the admission. Identify if the patient has a DNR or palliative care status.

- **POA status of devices or ostomies:** Review for documentation of the presence and condition of all devices and ostomy sites. Are there possible complications, a recent surgery, or conditions still being treated (cancer, infections, etc.)? Is there potential for a patient safety issue (PSI)?
- **Confusion/altered mental status/skin ulcers:** Are these conditions present, and is there a corresponding diagnosis?
- **Assessment/medical decision-making:** Read the chart and understand the story. This may reveal differential diagnoses that require clarification in the documentation.
- **Diagnosis/impression:** Review for medical necessity and accuracy of documented diagnoses for appropriate capture in final coding. Do the conditions relate to the admission diagnosis?

History and physical (H&P)

The H&P provides concise information regarding a patient's history and exam findings at the time of admission. In addition, it outlines the plan for addressing the issues that prompted the admission. The provider should capture his or her medical decision-making for the inpatient admission in this document. Following are some of the elements for which a CDI specialist should review:

- **Chief complaint:** How does it compare or contrast to the ED diagnosis? Does it relate to the principal diagnosis?
- **Changes from ED record:** What is new or different? What additional clinical support is documented? What conditions are not mentioned or are no longer supported clinically? Are there queries required? What information should be reviewed during follow-up in initial progress notes?
- **Relevant past medical history:** Capture chronic conditions not included in the ED documentation. Look for a correlating diagnosis for medications being continued in the acute care stay. Clarify current symptoms against past medical conditions, such as Alzheimer's disease, Parkinson's disease, or encephalopathy. What did nursing document about the patient's behavior?

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- **Relevant physical findings:** Review the complete physical exam for normal and abnormal findings. Examples to capture include:
 - Ostomy site presence and appearance
 - Wheelchair/bedbound/functional quadriplegia, disability, lack of mobility, DNR status (these are important mortality risk factors)
- **Documentation discrepancies:** Any inconsistencies in the documentation should be clarified through a query. Examples include:
 - Skin or mucosa documented as moist, but patient is dehydrated.
 - Pressure injury documented, but no mention of such injury on skin assessment.
 - Sepsis diagnosed, but patient appears in no acute distress and with no findings of chills, rigors, or clamminess. The general assessment of a patient with sepsis should include the concepts “acutely ill,” “septic,” or “toxic.”
 - Respiratory failure documented, but no shortness of breath, increased work of breathing, elevated or decreased respiratory rate, accessory muscle use, or respiratory distress.
 - Malnutrition documented, but patient is described as “well-developed” or “well-nourished.”
- **Significant findings:** What diagnoses should be captured? What findings are normal and abnormal based on the conditions documented? What are the diagnostic testing results to rule in or rule out a diagnosis? Is there clinical support for your diagnoses?
- **Diagnosis/impression:** Identify documented diagnoses. Note the changes from the ED diagnoses and whether they are clinically supported. Which queries should be issued at this point? Which queries are possible but should be postponed until further information is available? What conditions, diagnostics, and treatment plans need to be followed up on?

Operative note or bedside procedures

- **Operative report:** Coding specificity is required to get the right DRG. Don’t review surgery cases until after the operation. Compare the brief op note with the dictated report for discrepancies.
- **Postop diagnosis:** Is it different than the preop diagnosis? Should it be?
- **Significant findings:** Review for complications, blood loss, and extra procedures.
- **Anesthesia notes:** Review for estimated blood loss, fluid volumes, and complications.

- **Complications:** Is a condition documented as a “complication”? Does it need to be referred to a patient safety committee or reviewed as a PSI? Does the documentation refer to a condition as a “complication” even though the condition seems clinically expected?

Review your diagnostics together and trend results to save time. These provide a timeline comparison. Both normal and abnormal results may be relevant.

Diagnostics and medications

- **Pertinent diagnostics:** Review your diagnostics together and trend results to save time. These provide a timeline comparison. Both normal and abnormal results may be relevant. Examples include laboratory studies, microbiology reports, radiology reports, EKGs, and echocardiograms. Do these results support, suggest, or rule out a diagnosis? Be sure to query regarding abnormal findings for conditions that are clinically significant (e.g., a clinician may not feel a sodium level of 134 supports a diagnosis of hyponatremia).
- **Relevant abnormal trends.** These might include:
 - WBC (infection or immunosuppression, cancer)
 - Na, K, Mg (hyper/hypo conditions)
 - Renal enzymes (creatinine, GFR trending/normalization for potential CKD or AKI/ATN)
 - INR, PT, PTT (bleeding, coagulopathy—a mortality risk factor)
 - H/H (anemia, cancers, acute blood loss)
 - Amylase/lipase (pancreatitis)
 - Protein/albumin/prealbumin (note these are NOT presently recommended as a sole indicator in the diagnosis of malnutrition, despite their use by some auditors)
 - LFTs (liver disease)
 - ABG/VBGs (acid-base disturbance and support of respiratory failure; PF ratios)
- **Significant/incidental findings:** Are the findings diagnosed and documented in the record? Is the report copied and pasted or “corroborated” by the provider’s documentation? Also look for:
 - Radiology reports (renal calculus, gallbladder sludge, liver mass, lung mass)
 - Labs with abnormal findings not diagnosed
 - EKG with arrhythmias and blocks
 - Echo with regurgitation, insufficiency, and ejection fraction percentage

Is there a diagnosis to match each medication? Has a new medication been introduced? Why? Has there been a change in antibiotics? Why?

- **Abnormal BMI:** BMI should be associated with a nutritional diagnosis by the provider. Is a query needed?
- **Diagnoses associated with medication treatment:** Is there a diagnosis to match each medication? Has a new medication been introduced? Why? Has there been a change in antibiotics? Why? Complex vs. simple PNA? Sepsis? Surgical infection? PSI? Do the medications clinically support the diagnoses documented?

Progress notes, consults, and nursing documentation

- **Diagnoses:** Review for diagnosis capture. Are new diagnoses clinically supported? Are there diagnostic findings with a relevant diagnosis? Do the findings support or rule out a diagnosis?
- **Significant skin assessment:** Compare nursing and provider documentation. Look for details on pressure injuries and staging.
- **Status changes:** What is different today? What is new or different between the documentation of the consult and the attending? Is a query needed for a documentation discrepancy or conflict?
- **Significant findings:** What is normal or abnormal? Why? Is it clinically supported? Is it diagnosed? Is a query needed?
- **Impression/plan:** Review for diagnosis capture. Is a clinical support query necessary? What is supporting the diagnosis (diagnostics)?
- **Relevant nutrition notes with abnormal BMI:** Do the notes clinically support a nutrition diagnosis? Educate nutrition staff to document “patient meets indicators for _____ as evidenced by _____.”

The above is not an all-inclusive list, but instead constitutes typical examples of what a CDI specialist would look for during an initial chart review. After initial review, the CDI specialist would formulate an appropriate query to the physician. The process of compliant querying is described in [Guidelines for Achieving a Compliant Query Practice](#) (ACDIS/AHIMA, 2017).

Initial vs. subsequent reviews

After conducting an initial review of the medical record, CDI specialists engage in subsequent reviews. For any given record, the initial and subsequent reviews may not always be performed by the same CDI specialist, so for the purposes of this paper, the term “subsequent” refers to any review of a previously reviewed record, not only the re-review of a record by the same individual.

The timing and frequency of subsequent chart reviews depends on the findings of the initial review and the focus of the organization's CDI program. Records in which the principal diagnosis is a symptom should be re-reviewed daily, as should records that have a pending query.

A subsequent review can be performed concurrently, while the patient is on the CDI specialist's worklist, or retrospectively, as a focused subsequent review. Focused subsequent reviews include reviews for mortality, quality reviews (e.g., HACs and PSIs), or other reviews of targeted diagnoses or DRGs.

As already noted, during an initial review, CDI specialists review key components of the record including the ED note, H&P, consults, operative/procedure notes, initial progress notes, labs, and radiologic studies. During this process, CDI specialists identify the principal diagnosis and comorbid conditions as well as any initial query opportunities. An initial review typically follows a straightforward method as described above. However, the focus of the CDI specialist shifts with each subsequent review. CDI specialists follow up on physician query responses, update their working codes, and possibly change their principal diagnosis based upon changes in the documentation of the patient's care. In addition, they continue reviewing the progress notes, notes by consulting providers, and operative and procedure notes. A thorough review of lab and radiologic studies may also yield supporting evidence for additional queries to the provider.

Subsequent reviews are prioritized based on the focus of the CDI program. Examples of prioritization for concurrent subsequent reviews include:

- Prioritization by DRG payer
- Cases without a CC/MCC
- Cases without two CCs/MCCs
- Cases with symptom DRGs
- Cases with low severity based on APR-DRG SOI/ROM
- Cases with absent or low mortality risk factors

Other considerations for prioritization of reviews include cases that have exceeded LOS and any organization-identified high-risk DRGs.

The timing and frequency of subsequent chart reviews depends on the findings of the initial review and the focus of the organization's CDI program. Records in which the principal diagnosis is a symptom should be re-reviewed daily, as should records that have a pending query.

Historically, many CDI programs focused solely on the financial impact of their reviews, and a CDI specialist would not perform subsequent reviews once the DRG and SOI/ROM were maximized. As the profession has shifted its focus toward quality, CDI managers now must consider the benefit of continuing reviews after DRG and SOI/ROM maximization. By doing so, a CDI specialist can ensure congruent and accurate documentation that is reflective of the patient's conditions, both acute and chronic. The record may also be scanned for complications, HACs, and PSIs during subsequent chart reviews.

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Some CDI programs require their CDI specialists to follow the record post-discharge if it contains outstanding queries. Others task their HIM/coding professionals with this responsibility. Who should own the record review post-discharge? Consider the following:

As the profession has shifted its focus toward quality, CDI managers now must consider the benefit of continuing reviews after DRG and SOI/ROM maximization. By doing so, a CDI specialist can ensure congruent and accurate documentation that is reflective of the patient's conditions, both acute and chronic.

- CDI specialists who follow their records retrospectively until query resolution have a greater familiarity with the record. They typically have better access to the provider to discuss queries, if needed. In addition, CDI specialists may already be rounding on floors or making contact with providers during meetings and can remind them of outstanding queries.
- HIM/coding taking ownership of retrospective query resolution allows CDI staff to focus on concurrent review and keep their productivity standards on track. The coder can final-code the record and determine if the query is still needed, while also determining if additional queries need to be placed on the record.

Regardless of who owns the process, CDI and coding managers should jointly decide on a process that works best for both departments. Striving for the most efficient process requires strong collaboration between CDI and coding professionals. Organizations should also decide which queries need to be followed up after discharge: All queries? Just queries that affect reimbursement? Just queries that affect quality indicators?

Many programs implement a second-level review process for mortalities, HACs, PSIs, and other targeted diagnoses or DRGs. CDI and coding management must determine who owns the queries generated from these types of reviews. Assigning these responsibilities to one department ensures a clear chain of command and responsibility.

Documenting the review: Capturing thought processes and critical thinking

CDI professionals spend so much time educating and encouraging physicians to clarify documentation within the patient's record that they often forget to document their own work. The process of CDI record review requires time and thought, and this process itself should be tracked and captured. This allows other team members to understand what has been reviewed, note any issues of concern, and stay abreast of ongoing communications with the provider. Keeping

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an accurate record of the CDI review facilitates re-review and final coding, while preventing rework for all involved. This documentation should demonstrate the work of the CDI review or the critical thought applied, meaning that if another colleague should pick up the patient's chart and complete a re-review, that person would have an understanding of the reviewer's thought process, priorities, and conclusions.

The purpose of CDI review documentation is to communicate the reviewer's thought process, not to restate the contents of the record. As such, large-scale copying and pasting serves no purpose. Instead, the documentation should provide a summary of the identified diagnoses and why they are considered significant to the encounter. It should also include the date and location of supportive material to allow for easy follow-up and identification of priorities.

At a minimum, a CDI specialist should document the following items during his or her workflow:

- Date of review and name of CDI specialist reviewer.
- Working MS-DRG.
- Principal diagnosis, including:
 - Where the diagnosis was found in the record
 - The sequencing rationale, if multiple conditions could be the principal diagnosis—this could include clinical concerns/focus of care, *AHA Coding Clinic*[®] guidance, and *ICD-10-CM Official Guidelines for Coding and Reporting*
- Identified reportable diagnoses, including:
 - Where the diagnosis was found in the record:
 - “AKI w/ATN; nephrology consult 7/1/18, Dr. Nephro”
 - Accompanying clinical indicators (labs, diagnostics, assessments) to support the presence and reportability (treatments, medications, etc.) of diagnoses—include sourcing and dates for all information:
 - “Creatinine rise to 3.5 from baseline 1.6 within 36 hours of CT contrast administration”
 - Clarification of POA status with clinical support as appropriate:
 - “Stage 4 pressure ulcer, left hip, POA-Y (nursing admission assessment 6/30/18)”
 - Flags or indicators for diagnoses providing CC/MCC or HCC, contributing to SOI/ROM, triggering a quality measure, etc. as appropriate to the encounter and purpose of the review:
 - “AKI with ATN (POA-N)—MCC”
 - “Stage 4 pressure ulcer (POA-Y)—MCC, HCC”
 - “CAUTI (POA-N)—HAC”

- Queries, including date of query, supporting clinical indicators, method (verbal and/or written), physician response, and any needed follow-up:
 - “7/1/18 Dr. Nephro: Verbal query for ATN related to IV contrast. Physician agreed.”
- Areas of concern or needed follow-up, noting any issues that are to be resolved in a repeat review:
 - “CXR 6/30/18 notes right lower lobe infiltrate, white count trending upward to 10,000.”
 - “Nursing assessment 6/30/18 0300: Patient demonstrating confusion to place and time. Requiring frequent reorientation.”
 - “Blood count demonstrating drop on DOS, EBL 150 cc with large infusion of fluids. Check repeat H&H tomorrow.”
- Explanations or comments for the coding staff or other team members, communicating any issues or inconsistencies found within the record:
 - “Dr. Smith states the patient’s fluid overload is not related to cardiac function”
 - “Dietitian states high BMI is not related to obesity—patient has dense muscle tissue”
- Identified date or plans for re-review prior to discharge, flagging the record for follow-up if necessary:
 - “Surgery scheduled 7/1—re-review 7/2”
 - “No need for further review unless patient is not discharged 7/1”

Reconciliation with coded data

Coded data is used for reimbursement purposes and to ensure proper risk stratification, such as in CMS Value-Based Purchasing, Pay-for-Performance, and the Hospital Readmissions Reduction Program. Coded data is used to report SOI/ROM as well as physician and hospital “profiling.” It also supports healthcare policy and public health reporting.

Given the multitude of uses for coded data, CDI departments should strive to meet goals and expectations relevant to their organization. Just as CDI professionals have a “review purpose” in mind as they perform concurrent reviews, they may wish to perform reconciliation to ensure the impactful elements reconcile with the coded data.²

2. Some organizations prefer pre-bill review be performed by coding professionals who can review the case in its entirety, with the CDI team performing reviews only for cases with queries. Reconciliation is a critical piece of the review process, regardless of who is ultimately responsible.

Just as physicians are not expected to become professional coders, neither should CDI professionals. There may be many codes a coding professional is compelled to code in meeting the needs and requirements of the reporting facility, and some of these may not require CDI reconciliation.

The process CDI professionals undertake to reconcile cases after coding can be daunting and intimidating. Many inpatient encounters have 30 or more codes assigned by a professional coder, and it can be difficult to parse these codes to judge CDI impact upon a case. Luckily, it is not necessary to check for the impact of each and every code assigned. Just as physicians are not expected to become professional coders, neither should CDI professionals. There may be many codes a coding professional is compelled to code in meeting the needs and requirements of the reporting facility, and some of these may not require CDI reconciliation.

In many instances, though, CDI specialists must note and reconcile discrepancies in the coded data with HIM/coding staff. CDI specialists must ensure that the principal diagnosis matches the coded data to categorize patients for quality and reimbursement purposes. Assignment of key “secondary” conditions impacts reimbursement, risk factors, SOI, and ROM.

For example, as a CDI specialist reviews one patient’s record, he or she notes the physician documented pneumonia “likely due to aspiration” in the progress notes as well as in the discharge summary. The patient failed a swallowing study and was placed on a modified diet, the head of the bed was elevated 30 degrees, and treatment included IV Zosyn. Upon review, the CDI professional notes that a code for unspecified pneumonia (J18.9) was assigned to the case. In this same record, the coder assigned N17.9, unspecified acute kidney injury, as a secondary condition. Upon detailed review of the record, the CDI specialist notes the nephrologist documented a more specific form of AKI—ATN—which is clinically supported and not contradicted elsewhere.

The code sets at right illustrate the potential impact of CDI specialist reconciliation on this example scenario.

Due to the complex nature of grouping and payment systems, CDI specialists must use an automated encoder/grouping system to judge the impact of coding combinations and permutations upon data. To facilitate review of MS-DRG and APR-DRG assignment, the

Original code set

- J18.9, pneumonia, unspecified organism
- N17.9, acute kidney failure, unspecified (CC)
- MS-DRG 194; relative weight 0.9002
- APR-DRG 139; SOI 2/ ROM 2 (ROM impacted by age of patient)

Amended code set after reconciliation

- J69.0, aspiration pneumonia
- N17.0, acute renal failure tubular necrosis (MCC)
- MS-DRG 177; relative weight 1.8408
- APR-DRG 137; SOI 3/ ROM 3 (ROM impacted by age of patient)

encoder should provide both MS-DRG and APR-DRG data, with the CDI specialist switching between MS-DRG and APR-DRG groupers as needed to judge the full impact of any reconciliation.

Advanced techniques for mature CDI programs

Historically, CDI reviews focused on capture of CCs/MCCs and accurate DRG/tier assignment. Payment shifts from volume to quality have changed the way many programs look at case prioritization. As CDI programs mature and CDI specialists become more experienced, the number of encounters reviewed becomes less important than the generation of valuable, valid queries. Programs that prioritize charts by payer, convenience, or floor assignment may reap dividends, but focusing attention and manpower on high-yield, high-impact cases can prove more fruitful.

Prospectively, certain providers, service lines, or procedures may be identified as likely to have documentation opportunities. Concurrently, high-risk cases may include sign/symptom DRGs, inpatient principal diagnosis/DRGs that are typically outpatient status for observation services, and 30-day readmissions. Retrospectively, additional review scrutiny might go to HACs, PSIs, mortality cases, and OIG target conditions. Pay attention to the inclusion and exclusion criteria for accurate quality reporting; for instance, there is no need to further investigate postprocedural respiratory failure if the patient is in MDC 4 or 5. Many CDI programs incorporate clinical validation queries of denial-prone diagnoses like sepsis, acute respiratory failure, and encephalopathy. Organizations and networks that participate in population management models may prioritize HCC surveillance.

Additionally, robust programs respond to triggers like outlier statistics on the Program for Evaluating Payment Patterns Electronic Report (PEPPER) or anomalies in service line observed/expected metrics. (See www.pepperresources.org for more on PEPPER.) For example, do your TAVR patients look less sick and complex than your competitor's? Perhaps a deep dive is called for. A drop in case-mix index (due to suboptimal documentation) or deviation from benchmarks may signal the need for a targeted review.

Mature CDI programs have three elements that distinguish them from burgeoning ones:

The savvy CDI specialist sees diagnoses that are suspect due to a lack of clinical support and generates clinical validation queries in response.

1. **They possess skilled CDI specialists knowledgeable about many clinical conditions, with an ability to recognize or anticipate risk-adjusting diagnoses.** CDI specialists review the medical record and analyze the data elements and pertinent clinical indicators to determine if additional information is needed for accuracy. They don't just interpret what is written; they imagine what could be or should be present in the record and query for it. The savvy CDI specialist sees diagnoses that are suspect due to a lack of clinical support and generates clinical validation queries in response. Additionally, a CDI program cannot be successful without educated, assertive, and determined CDI staff that follow up to obtain responses from the provider. An experienced CDI specialist doesn't let a query die unanswered.
2. **They possess seasoned CDI specialists who can analyze data patterns and adjust focus accordingly by performing second-level reviews.** A second-level review is a second look at a case, often performed by a more seasoned CDI specialist. These reviews are performed retrospectively but pre-bill. These must be done promptly to avoid a buildup of accounts in discharged not final billed status, although organizations should implement a process to rebill cases within a payer-identified time frame, if necessary. How do you determine which cases merit second-level review? Some categories may be required by administration or quality, such as a high outlier on PEPPER data for one-day stays for medical DRGs or all mortalities, HACs, and PSIs. Sometimes a trend is identified and an alert is prospectively applied to a DRG or service line (e.g., MS-DRG 27, Craniotomy and Endovascular Intracranial Procedures without CC/MCC). Reports can be run to identify cases warranting second-level review—for example, cases without CC/MCC exceeding geometric LOS by X number of days—or in response to deviation of the DRG distribution from MedPAR or from your baseline distribution. Denials can also guide your choice of DRG or flag specific high-risk codes for additional scrutiny. The key to success for a second-level review process is having trained personnel to perform the deep dive. These should be your most experienced CDI specialists. They often have a role as analysts, and they may perform quality assurance on their fellow CDI specialists as well. They must work well under time constraints because these advanced reviews must be turned around quickly to drop the bill in a timely fashion.

3. **They close the loop with education.** When analysts note patterns—for example, specialists not recognizing complications from devices, or a systemwide problem with sepsis documentation— they should bring the information back to their colleagues for education. Mature CDI programs take data from chart review and circle back to the service lines to inform and educate providers. Fixing a problem on the front end is always preferable to expending time and resources on the back end.

The role of technology

Any discussion of chart review would not be complete without looking at the impact of technology. Today, computer-assisted coding (CAC) automatically generates or suggests medical codes based on clinical documentation. CAC now makes use of natural language processing (NLP), which identifies relevant phrases in documentation and associates them with medical codes. NLP engines interpret and combine concepts, accounting for morphology, syntax, semantics, and real-world knowledge.

Organizations are now leveraging this technology on the front end, prompting providers to provide specificity at the point of care while they are actively documenting. This technology also plays a role in CDI chart reviews. Computer-assisted CDI suggests queries to the CDI specialist for clarity and specificity. This software searches EHR documentation for specific diagnostic statements and unique anatomical site acronym terms and/or abbreviations.

For this technology to be successful, however, users must embrace it. When CAC was introduced, there was a worry that it would eliminate coders' positions entirely, causing distrust and lack of buy-in (Kohn, 2013). Yet CAC does not possess knowledge of coding guidelines, clinical concepts, or compliance regulations, and coders and CDI specialists can override suggestions made by the software. In 2013, the AHIMA Foundation in collaboration with Cleveland Clinic examined the impact of CAC on coding time, accuracy, and precision. The study found the "combination of CAC with a credentialed coder/auditor is just as good or better than a coder or CAC alone" (Dougherty, Seabold, & White, 2013).

The most recent CAC software includes artificial intelligence, creating a stand-alone technology platform. However, CDI specialists must not rely solely on auto-suggested codes; they still must apply their own critical thinking to the record. CDI managers must develop a process of reviewing as well as updating CAC and NLP

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to minimize coding errors, false positives, and false negatives. Not every vendor will implement updates to the ICD-10 code set in a timely manner. In addition, do not assume software will match clinical treatment changes. You may have to work with your CAC vendor to customize the lab values that warn of early sepsis, for example.

Case prioritization technology has become another valuable tool for CDI programs. Many organizations leverage CDI professionals to assist with other inpatient initiatives beyond traditional CDI review. Case prioritization is essential for programs tasked with expanding reviews without additional staffing. Prioritization tools are designed to optimize productivity and program efficiency, allowing CDI specialists to review high-risk cases or those lacking in specificity for POA status, HACs, or PSI assignment.

CAC, NLP, and case prioritization software all require integration with systems beyond the EHR, and managers should consider whether they are able to interface with CDI, business intelligence, and reimbursement analysis systems. Case prioritization software may not be customizable to your facility's specific needs. As a whole, these technologies can assist organizations; however, they require a team approach for maximum benefit.

Conclusion

Reviewing the medical record is akin to assembling a puzzle—it takes time, patience, and skill. It also requires a CDI specialist with clinical and coding knowledge who can apply critical thinking to the facts of the case and formulate an appropriate clarification or query to the physician.

As organizational priorities change, so too must record review processes and priorities. CDI specialists must adapt to new organizational priorities and changing regulations. They must stay abreast of the latest diagnostic criteria, treatments, and documentation and coding changes to keep their review skills sharp.

With all this in mind, if CDI specialists follow the principles outlined in this paper—ensure congruence between their record reviews and organizational objectives; follow a step-by-step, thorough review strategy of the entire record; perform well-timed re-reviews; document their work; reconcile important coded data; and marry their expertise to appropriate assistive technology—their roles will remain relevant and their efforts critical to optimal financial, quality, and patient care outcomes. The end result should be a record that tells the story of a patient encounter.

Acknowledgments

ACDIS would like to thank the following Advisory Board members for principal authorship of this white paper:

- Angie Curry
- Paul Evans
- Katie Good
- Jeff Morris
- Laurie Prescott
- Erica Remer
- Deanne Wilk

The contents of this paper were reviewed by the ACDIS Advisory Board.

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