The Clinical Integration Hierarchy: A Primer on the Backbone of Data-driven Quality and Cost Improvement

By Dr. Ed Corbett

We think it’s important to transform a health system’s department-based approach of organizing care into something more usable like a horizontal, service-line approach. This new way of organization, the Clinical Integration Hierarchy, allows for more precise analytics of the care provided—and thus more actionable data for clinicians or administration.

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How Care is Really Ordered: The Clinical Integration Hierarchy

Traditionally, healthcare delivery is siloed into departments and distinct care settings. However, due to the arrival of accountable care and other value-based models, health systems need to organize and coordinate care delivery across the continuum. But getting to this enterprise-wide approach is no easy task. How does an organization realistically go about breaking down those siloes and coordinating care?

At Health Catalyst, to break down the silos and coordinate care across the continuum, we’ve developed the Clinical Integration Hierarchy. This hierarchy groups healthcare into work processes that reflect how care is actually delivered—across departments and care settings. It serves as the foundation for systematic quality and cost improvement.

The Clinical Integration Hierarchy consists of three (and a half) levels:

- **Care Processes:**
  
  This is the most granular level of the hierarchy, where billing, claims, diagnostic, and procedure codes are mapped to individual care processes. A care process is a key work process—a condition whose management is central to the work of the healthcare organization. Examples of care processes include:

  - Hyperlipidemia
    - Coronary Atherosclerosis
    - Acute Myocardial Infarction (AMI)
    - Cardiac Rehab.

- **Sub-Care Processes (here is the half-level part):**

  In some cases, we’ve further divided care processes into sub-care process to allow for a more precise analysis of variation. An example of this is a care process like AMI (listed above), which may include multiple expensive procedures such as Percutaneous Intervention (PCI) and Coronary Artery Bypass Graft (CABG). This can skew costing data and make it more difficult to detect true variation if combined into one care process. The sub-care processes solve this problem.
Care Process Families:

Care processes that are linked by a common pathologic condition are grouped into a care process family. The examples of care processes provided above belong to the Ischemic Heart Disease family.

Clinical Programs:

Care process families are then grouped into clinical programs. Ischemic heart disease falls under the Cardiovascular clinical program. The following eleven clinical programs make up a comprehensive healthcare delivery system:

- Behavioral Health
- Cardiovascular
- Community Care
- Gastrointestinal
- General Medicine
- Musculoskeletal
- Neurosciences
- Oncology
- Respiratory
- Surgery
- Women and Newborns

A quick side note: Because kids are not just little adults (as pediatricians will often say), pediatrics has its own clinical hierarchy. But it’s similar to this.

What is particularly significant about these care processes, families, and clinical programs is that they span the continuum of care, mirroring the real interaction between different clinicians and specialists in multiple settings.

Take one clinical care process—acute myocardial infarction (AMI)—as an example. If someone has a heart attack, she might first be seen by a physician in the ED. Then she might see a cardiologist who assesses whether or not to perform an angiogram. If an angiogram shows multiple blockages, the patient might then undergo bypass surgery, after which she is admitted to the ICU under the care of an intensivist. Billing, common organ, or specialty hierarchies would consider each of these encounters in a separate, siloed
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The Importance of the Clinical Integration Hierarchy

The Clinical Integration Hierarchy serves as a foundation for systematically tackling quality and cost improvement. Health systems and other care providers are aggregating vast stores of data, but they often struggle to figure out how to start using that data to drive improvement. The Clinical Integration Hierarchy provides a relevant, focused structure for prioritizing and implementing improvement initiatives.

Prioritizing Clinical Improvement Efforts

By organizing and analyzing data according to care processes, health systems can determine which processes offer the greatest opportunity for quality and cost improvement and then organize their improvement efforts around them. At Health Catalyst, we call this data-driven prioritization “Key Process Analysis.” Key process analysis reveals that among the hundreds of clinical care processes, only a limited number make up the majority of services provided to patients—and only a small percentage of these account for the majority of an organization’s cost and variability. Pinpointing the highest-volume care processes that exhibit the greatest variability enables health systems to dedicate their limited resources to tackling the most important improvement projects first.

Implementing Improvement: A Systematic Approach

The best way to achieve and sustain quality and cost improvement is a systematic approach we call the three systems (i.e., the content, analytics, and deployment systems). Healthcare organizations must implement all three systems to achieve ongoing success. In addition, the three systems must work together—and the Clinical Integration Hierarchy serves as the common link between them.
In fact, the hierarchy serves as the backbone of the three systems:

**The content system:**

The content system involves standardizing knowledge work—systematically applying evidence-based best practices to care delivery. The hierarchy guides the application of this evidence-based content to the ordering and delivery of care. Once health systems know what the care processes are, they can map them out and apply best practices, such as standardized order sets, to key decision points in the process. The hierarchy also serves as the basis for organizing patients into targeted cohorts (diabetics, heart failure patients, etc.).

**The analytics system:**

This system includes the technology and the expertise to gather data, make sense of it, and standardize measurements. Aggregating clinical, financial, patient satisfaction, and other data into an enterprise data warehouse (EDW) is the foundational piece of this system. The hierarchy focuses this analytics system. Health systems have large quantities of data on hand and are faced with the challenge of how to organize and use that data. The Clinical Integration Hierarchy delivers the needed structure and focus. Subsequent analyses are performed to assess performance in particular care processes, care process families, and clinical programs.

**The deployment system:**

This system involves driving change management through new organizational structures. In particular, it involves implementing team structures that will enable consistent, enterprise-wide deployment of best practices. The hierarchy structures the entire deployment system. Once a health system decides which care process to target, it then organizes an improvement team that aligns with that care process. The team includes clinicians and other professionals from across the continuum who participate in the care process. This care process team reports up to a team organized around the care process family, which in turn reports up to a team overseeing all improvement efforts for the clinical program.
If you’re interested in learning more about the Clinical Integration Hierarchy, the Three Systems Approach, and how they work together to enable systematic improvement, we invite you to read our recent whitepaper, *Anatomy of Healthcare Delivery Model: How a Systematic Approach Can Transform Care Delivery*, written by Dr. David Burton. Dr. Burton, who pioneered quality improvement at Intermountain Healthcare, was one of the primary developers of our Clinical Integration Hierarchy.

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**Resources**

- Accountable Care Organization (ACO) Solutions [https://www.healthcatalyst.com/aco/](https://www.healthcatalyst.com/aco/)
- It all starts with a data warehouse [https://www.healthcatalyst.com/late-binding-data-warehouse-platform](https://www.healthcatalyst.com/late-binding-data-warehouse-platform)

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ABOUT HEALTH CATALYST

Health Catalyst is a mission-driven data warehousing, analytics, and outcomes improvement company that helps healthcare organizations of all sizes perform the clinical, financial, and operational reporting and analysis needed for population health and accountable care. Our proven enterprise data warehouse (EDW) and analytics platform helps improve quality, add efficiency and lower costs in support of more than 50 million patients for organizations ranging from the largest US health system to forward-thinking physician practices.

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About the Author

Edward Corbett, M.D. joined Health Catalyst in June 2014 as a medical officer. He earned his medical degree at the University of Texas Health Science Center in San Antonio where he also completed his residency in Internal Medicine. He is board certified in Internal Medicine. He started his career as a physician at the Cooper Clinic in Dallas, Texas specializing in preventive medicine. Prior to joining Health Catalyst he was a physician partner at Central Utah Clinic, a large multispecialty clinic which was the first Medicare ACO in the state of Utah. He has a special interest in improving patient care through the better use of technology and has been actively involved in clinical IT throughout his career.