Outcomes improvement work in healthcare isn’t about enforcing cookie-cutter medicine—it’s about standardizing care around best practices, which is a highly customized experience. For example, everyone knows that a consistent, evidence-based approach to sepsis screening is critical; but what’s just as critical is implementing a screening process and tool in a customized way that meets the health system’s needs, culture, workflow, and goals. Continuous, sustainable improvement demands this sensitivity to context.

Health Catalyst®’s outcomes improvement work embraces the standardization-customization paradox in healthcare by empowering health systems to make it easy to do the right thing through evidence-based best practices that truly work in their unique environments. In Health Catalyst®’s work with clients on clinical care processes (e.g., sepsis, heart failure, and pneumonia), early detection is a frequent outcomes improvement focus. Prioritizing improvements in early detection and action can yield significantly better clinical, financial, and patient experience outcomes.

This executive report explains the importance of focusing on early detection and action, identifies the top three barriers to improvements in this area, and describes the six must-haves (including the most effective tools) for improving early detection and action. It also features an early detection and action success story—a real-world example of how Health Catalyst® applied its Three-Systems Approach to outcomes improvement to yield measurable, sustainable results.

### A THREE-SYSTEMS APPROACH TO OUTCOMES IMPROVEMENT

Health Catalyst® tackles the standardization-customization paradox using its Three-Systems Approach for achieving meaningful, sustainable outcomes improvement. In this approach, best practice (standardization), healthcare analytics, and adoption (customization) come together to garner system-wide support for improvement work, engage all stakeholders (administrative, technical, and clinical), and inspire a system’s best thinking about what works best for their system.
Outcomes-based healthcare also targets a more proactive approach to healthcare: creating a healthcare system that can maintain healthy populations and prevent illness. Early detection embodies a proactive approach to healthcare; and it is often a very promising focus area for outcomes improvement work.

PRIORITIZE EARLY DETECTION AND ACTION TO IMPROVE OUTCOMES

Healthcare is transitioning away from fee-for-service toward value-based care; a switch that necessitates outcomes-based healthcare. As healthcare organizations strive to make the switch, they must balance the reactive and proactive aspects of outcomes-based healthcare. On the reactive side of the balance, for example, systems must improve how they care for their sick or injured patients—continually find ways to make care safer, more effective, and less costly.

Outcomes-based healthcare also targets a more proactive approach to healthcare: creating a healthcare system that can maintain healthy populations and prevent illness. Early detection embodies a proactive approach to healthcare; and it is often a very promising focus area for outcomes improvement work. Most conditions have better outcomes (require less intensive treatment or allow for interventions that prevent complications) the earlier they’re detected.

Taking a look at sepsis, for example, early detection is particularly important when it comes to improving sepsis outcomes because sepsis progresses rapidly and has a high mortality rate. The patient frequently presents with multiple non-specific complaints that make it easy to misdiagnose the problem and fail to recognize the seriousness of the patient’s condition. In severe sepsis, timing becomes the most important component of the patient’s care. According to a 2006 study by Anand Kumar, each hour that care is delayed increases mortality by 7.6 percent.

Health systems need to improve early detection and shorten the time to treatment by focusing their efforts first in the ED, where the majority of sepsis patients present, and make screening part of triage. Although standardized care, such as a sepsis screening tool,
Overcoming logistical, technical, and cultural barriers to improvement efforts requires a variety of tools and strategies, from analytics and multidisciplinary teams to a willingness to shift an entire culture and get creative about customized ways to implement standard best practices.

is widely understood and targeted, it's the adoption (customization) aspect that tends to stand in the way of meaningful, sustainable outcomes improvement.

THREE COMMON BARRIERS TO OUTCOMES IMPROVEMENT

Health systems understand the importance of early detection and standardized tools, but struggle to overcome logistical, technical, and cultural barriers to outcomes improvement.

Barrier #1: Logistical

Health systems frequently mention the logistical barrier of not having the right people or enough people to implement best practices. Logistical barriers related to workflow and clinical processes (e.g., having IV supplies available at triage), such as scheduling and supplies, can be a barrier to improving early detection. Truly understanding who does what and implementing a standardized way of doing it are logistical barriers health systems must overcome.

Barrier #2: Technical

The availability of and access to healthcare data is a technical barrier that can be overcome with an enterprise data warehouse (EDW) that aggregates data and puts the right information into the right hands at the right time. Analytics is one of three vital systems in Health Catalyst®'s Three-Systems Approach for improving outcomes; without it, systems will struggle to improve early detection and action efforts.

Barrier #3: Cultural

Cultural barriers tend to present the most nuanced challenges, ranging from clinicians who resist standardized tools because they “know sepsis when they see it” to problems escalating concerns without an effective feedback loop, especially in a chaotic ED environment. Many health systems take the “check box” approach to improvement, in which they accomplish a goal, check it off the list, and move on. Multidisciplinary teams can help remove this cultural barrier by integrating change into the workflow and sustaining it. For example, regarding a sepsis screening tool to be administered at triage, multidisciplinary teams can help redesign the workflow in a way that increases adoption of this early detection initiative.
Multidisciplinary teams bring diverse roles, expertise, and responsibilities together; a diversity of experience that’s critical for managing care transitions. Teams united around a patient focus can improve care transitions, workflows, and outcomes.

According to the Journal of the American Medical Informatics Association article, Managing Change, “The major challenges to system success are often more behavioral than technical. Successfully introducing such systems into complex health care organizations requires an effective blend of good technical and good organizational skills.” Health systems and clinicians may have a strong understanding of sepsis best practice, for example, but still aren’t achieving their outcomes improvement goals. To move beyond understanding to implementation, health systems need to focus as much on the “how” of adoption and intervention as they do the “why” of best practice.

**SIX MUST-HAVES FOR IMPROVING EARLY DETECTION AND ACTION**

Overcoming logistical, technical, and cultural barriers to improvement efforts requires a variety of tools and strategies, from analytics and multidisciplinary teams to a willingness to shift an entire culture and get creative about customized ways to implement standard best practices.

**Must-Have #1: Multidisciplinary Teams**

Multidisciplinary teams have the power to drive adoption by garnering broad support for standardization and integrating necessary changes into the workflow. Multidisciplinary teams include the variety of roles, expertise, and responsibilities necessary for safe and seamless transitions of care and sustainable improvements. These teams are critical for improving care coordination and communication because they’re united around common, patient-centered goals. Health Catalyst® works with health system teams at all levels in all departments, and carefully addresses competing concerns and unite everyone’s focus around the patient.

**Must-Have #2: Analytics**

Health systems need to prioritize analytics and data-driven decision-making. Analytics should surface data to improve and support early detection efforts—showing, for example, where...
patients enter the system and where variation in practice and outcomes is greatest. These are actionable insights that help systems know where to focus improvement efforts. Health Catalyst’s clinical analytic visualizations, for example, use health system data to communicate current and historical performance in areas that, based on evidence, are most likely to improve outcomes. Visualizations are outcome-focused, aim-directed, and actionable.

**Outcome-focused:** connected to the health system’s clinical, financial, and patient experience performance indicators and expressed in a way that matches the system’s quality improvement vision. For example, one client features a sepsis-related visualization for the number of “Lives Saved.”

**Aim-directed:** tailored to specific aims intended to improve system outcomes (e.g., process aims, such as improved compliance with a care bundles).

**Actionable:** enabling drill-down to granular data at the order or patient level, which helps staff get to the “why” behind the data. This leads to the necessary refinement of interventions to improve performance. For example, one client has a view that reveals and guides the antibiotic choices for pneumonia treatment in sepsis patients.

**Must-Have #3: Leadership-Driven Culture Change**

Health systems can’t improve outcomes without a system-wide culture that embraces change and the inevitable challenges that come with it. Leadership-driven buy-in for this improvement culture transformation is vital. It must be clearly articulated, consistently reinforced, and continually modeled and demonstrated at all levels. Leadership’s role in transforming [organizational](#) culture must be continuous and sustainable. Leadership support extends beyond the start of outcomes improvement work it should become the persistent, permanent driving force behind all improvement efforts.

**Must-Have #4: Creative Customization**

While high-tech interventions, such as EMR alerts, are valuable, don’t underestimate the power of low-tech interventions. For example, one health system found that simply putting red blankets on patients who screened positive for sepsis were powerful visual cues that engaged clinicians better
Outcomes Improvement teams armed with Health Catalyst®’s tools, best practices, analytics, and professional expertise learn from their data and drive sustainable change through organization-wide adoption.

than EMR alerts. In an industry that’s so focused on innovation and technology, systems should get creative when it comes to creating and customization improvement tools. Sometimes the most effective interventions are low tech, which ties back to the importance of customization (what works best for one system may not work for another system).

**Must-Have #5: Proof-of-Concept Pilot Projects**

Some health system departments are more resistant to change than others. Overcome this barrier by assembling a team of motivated early adopters and identifying a champion or small team willing to experiment. When other departments witness the success of a small, proof-of-concept pilot project, they’ll naturally want in on the success. For example, a few providers at one health system started using a new application that had patient navigators call patients who weren’t compliant with treatment recommendations (e.g., foot exams for diabetes patients). They quickly realized a substantial increase in revenue as a result of more patients receiving standardized, recommended care. They also noticed a spike in patient satisfaction; patients enjoyed getting a call from a human being. By starting small, the system figured out a way to increase revenue, outcomes, and satisfaction.

**Must-Have #6: Health Catalyst® Tools: Knowledge Briefs, Outcomes Improvement Packets and Worksheets, and Care Process Improvement Maps**

Health Catalyst® works with a variety of diverse health systems faced with similar outcomes improvement challenges. Based on its extensive knowledge and experience, Health Catalyst® developed and refined several effective tools to help systems improve quality, zero in on the appropriate improvement focus areas, and provide answers to important questions:

- Within a particular care process, what should we focus on?
- What’s the impact on key outcomes, such as cost, mortality, patient experience, etc.?
- What can we learn from other healthcare systems efforts?
- What metrics should we use to evaluate our progress?

Outcomes Improvement teams armed with Health Catalyst®’s tools, best practices, analytics, and professional expertise learn from their data and drive sustainable change through organization-wide adoption.
Knowledge Briefs

Health Catalyst®'s Knowledge Briefs summarize current evidence and trends in outcomes improvement related to specific care/workflow processes and include four helpful elements:

- Why the focus area is important.
- Guidelines influencing best practices.
- Trends/promising areas of focus for outcomes improvement.
- Supporting references.

Outcomes Improvement Packets

Health Catalyst®'s Outcomes Improvement Packets distill technical, medical, and quality improvement knowledge to facilitate quality improvement efforts. They include ideas to help improvement teams create goals and aims, plan interventions, and focus on meaningful measures. When used with Outcomes Improvement Worksheets, they help teams analyze and prioritize improvement goals based on their own data and culture. Outcomes Improvement Packets includes several important elements:

- **Key outcome improvement opportunities**: clinical (e.g., reduce mortality rate), financial (e.g., decrease variable cost per case), and experience (e.g., improve health-related quality of life).

- **Recommended initial improvement focus areas**: identified by yellow “storm clouds” based on a literature review, input from clinical experts, and experience with health system clients. Each recommended focus area includes problems addressed, potential outcome goals, process aims, and interventions, and tools for transformation.

Outcomes Improvement Worksheets

Health Catalyst®'s Outcomes Improvement Worksheets are most helpful when used in tandem with Outcomes Improvement Packets. These worksheets help systems identify their problems and understand their unique environments. Worksheets lead to the critical customization step of implementing standardized best practices. Balancing standardization and customization is where Health Catalyst® professional services can help; best practices are standard; adoption is customized. Everyone uses the same sepsis screening tool, but adopting it in a way that meets each system’s needs varies significantly.

Care Process Improvement Maps
Health Catalyst’s Care Process Improvement Maps get clinicians, data experts, and system leaders on the same page—literally—by merging analytics, improvement opportunities, and best practices into one simple visual map. They provide a visual overview of the care process across the continuum of care and includes four helpful items:

- Key, evidence-based best practices for each phase of care.
- Storm clouds indicating areas with the greatest improvement opportunity.
- Metrics and data visualizations available in the application.
- Knowledge assets (e.g., order sets and screening tools).

**EARLY DETECTION AND ACTION SUCCESS STORY: THIBODAUX IMPROVES SEPSIS OUTCOMES**

Sepsis ranks high on Health Catalyst’s key process analysis of opportunity based on financial and volume metrics from a large, normalized data set. Sepsis is a serious medical condition caused by an overwhelming immune response to infection that can lead to tissue damage, organ failure, and death. Between 28 and 50 percent of people who get sepsis die, and it has the highest mortality rate and cost of any condition treated in U.S. hospitals.

Thibodaux Regional Medical Center achieved sepsis mortality rates below the national average using Health Catalyst’s Three-Systems Approach to outcomes improvement.

- **System #1—Best Practice:** Thibodaux performed research and gathered data to identify problems, root causes, and best practice for care of patients with sepsis.

- **System #2—Analytics:** Thibodaux provided analytic support and applications to give faster access to valid and actionable data. The team leveraged the electronic health record (EHR) to provide decision support through order sets, protocols, and alerts.

- **System #3—Adoption:** Thibodaux adopted an agile methodology for application development and implementation. The team also employed education, training, and road shows to ensure a high level of clinician buy-in and adoption.

**System #1: Best Practice**

To improve early recognition of sepsis in the ED, the team
Implemented a screening tool that clinicians could use as patients presented in the ED. If patients met certain of those criteria, they were placed on sepsis watch or sepsis alert. Patients with a sepsis watch or sepsis alert would show up in the EHR with a uniquely colored patient header, helping ensure that they received rapid treatment.

**System #2: Analytics**

Thibodaux’s analytics revealed several key problems:

- No screening tool was in place in the ED for early identification of sepsis patients.
- Clinicians were not consistently following best practice recommendations for sepsis.
- Treatment was frequently delayed pending an accurate diagnosis.

The team deployed an advanced analytics application for sepsis powered by Health Catalyst® to support process improvement efforts, making it possible to see the impact of interventions and to correlate those interventions with patient outcomes. The sepsis team also included in its application an early recognition dashboard that is used to see how often the protocol is applied, how well the screening is done, and how quickly the physicians see the patients.

**System #3: Adoption**

The sepsis improvement team knew that well-laid plans and sophisticated analytics applications would not deliver successful outcomes without a deployment plan that engendered high levels of engagement and adoption. The team provided clear communication with consistent messaging in multiple venues, including education and training to foster adoption. The team used multiple methods of communication across the organization to share expectations and outcomes with the medical staff, the board, and frontline staff. Team members clearly communicated the end result that they were moving toward.

Thibodaux had fun with the education process, starting off with a big kickoff event with a band, caterer, and T-shirts. They hosted “Sepsis on the Road” seminars where they sat with primary care physicians, showed them the application, and shared their plan for practice changes to improve the care for
sepsis patients. These seminars included a high level of physician participation and enabled doctors to talk with doctors about the coming changes.

**Key Results**

By forming a sepsis improvement team that implemented best analytics system, application targeted at sepsis care, and adoption approach that engaged clinicians using education and data, Thibodaux’s sepsis improvement initiative achieved impressive results in just six months:

- Decreased sepsis mortality rate to half of national average
- 7.3 percent reduction in average variable cost
- Reduced Length of Stay (LOS) by one day
- 7 percent improvement in patient satisfaction

**EMBRACING THE STANDARDIZATION-CUSTOMIZATION PARADOX TO IMPROVE EARLY DETECTION**

Reducing variation requires creativity—health systems must understand their uniqueness and creatively design interventions that address their distinctive problems. Health systems have to do the hard work of crafting outcomes improvement efforts that will be successful given their systems’ diverse environments.

Health Catalyst® helps systems do this hard work using tools, such as the Outcomes Improvement Worksheet, to improve outcomes in customized ways that work for each individual system. The uniqueness of each approach is evidenced by the variety of successful low-tech and high-tech interventions systems have created and implemented to improve outcomes, such as Thibodaux’s early detection efforts to improve outcomes for sepsis patients.

Given the volume of barriers to implementing best practices, from cultural to technical, health systems are faced with the challenge of identifying and creatively overcoming them to achieve and sustain improvements. Although implementing standardized tools isn’t a quick win, the acute and chronic care related improvements make it a worthy pursuit. Creating an improvement culture that prioritizes early detection and implements standardized screening tools in ways that meet the organization’s needs is key to significantly improving clinical, financial, and patient experience outcomes.
ABOUT THE AUTHORS

Kirsten Scott has a background in instructional design. She began work at Health Catalyst® in 2014 after 12 years as a medical writer at Intermountain Healthcare. There she worked primarily with Women and Newborns and Pediatric Specialty Clinical Programs.

Tracy Vayo joined Health Catalyst® in 2014 as Director of Knowledge Development, bringing over 25 years of experience in various facets of healthcare and clinical writing and education. Immediately prior to her work at Health Catalyst®, Tracy spent nearly 13 years directing the efforts of a clinical publication team at Intermountain Healthcare – creating innovative care process models, patient education, and implementation tools for clinical best practice improvement. Prior to that she directed multidisciplinary education programs at Primary Children’s Hospital and created and managed cardiac rehabilitation and wellness programs for several hospital systems. Tracy holds a Master’s degree in clinical exercise science and a Bachelor’s degree in health education with a communications emphasis.