amplifire
When Learning Matters

REDUCING CAUTI BY 38%

Case Study in eLearning

CAUTI Prevention Courseware

EXECUTIVE SUMMARY

PROBLEM

CAUTI is the most common hospital-acquired condition and the leading cause of avoidable harm.

THE STUDY

2,424 providers and 5,721 nurses received an Amplifire course teaching the bundle of protocols that have been shown to significantly reduce the incidence of CAUTI.

RISK REVEALED

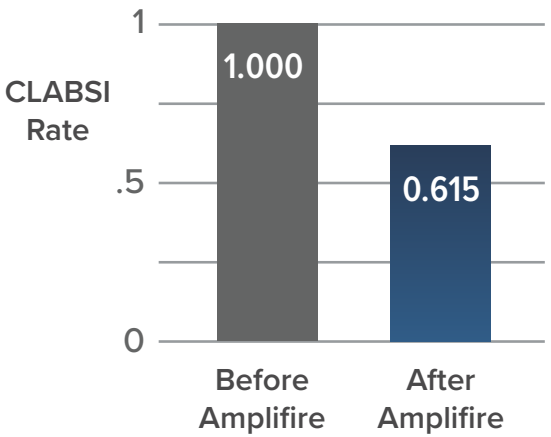
- 43% of RNs were confidently misinformed on the topics of bacteriuria and antimicrobial stewardship
- 58% of providers were confidently misinformed on the topics of catheter maintenance and timely removal

DETECTED AND CORRECTED

- 26,308 instances of Confidently Held Misinformation™
- 27,855 instances of uncertainty

TRAINING RESULT

A 38% decrease in CAUTI incidents



PROBLEM

CAUTI Is the Leading Cause of Avoidable Harm

30 million urinary catheters ordered per year

Most common Hospital Acquired Condition (HAC)

Cost of $500 million per year to the American economy

50% are unnecessary

About 30 million indwelling urinary catheters are inserted each year, leading to nearly 1 million catheter-associated urinary tract infections (CAUTIs). These infections are the most commonly reported hospital-acquired condition (HAC). CAUTIs extend a patient's hospital stay by two to three days.

Shockingly, studies regularly find that as many as 55% of indwelling urinary catheters in patients are unnecessary.[1] They should not have been ordered. The harm they may potentially cause is entirely avoidable.

There is a need to:

- Teach the bundle of protocols that have been shown to substantially reduce CAUTI incidence
- Make sure that nurses and technicians know that urinary catheters are often not needed

A large east coast hospital realized that traditional training alone, would not effect change. Continuing medical education had proven ineffective. Nurses and technicians were often multitasking and not actively engaged in learning, so it rarely stuck in memory.

1. Reducing unnecessary urinary catheter use and other strategies to prevent catheter-associated urinary tract infection: an integrative review

STUDY DESIGN

8,145 Clinicians at an East Coast Hospital

2,424 providers and 5,721 nurses received an Amplifire course covering the topic of CAUTI.

This course was built from a short bundle of protocols shown to be the most valuable tool in bringing CAUTIs under control. Multiple studies have shown that the prevalence of CAUTI can be reduced in hospital systems by 45% or more using the strategies taught in this course.[2]

This course moves learners to become part of the battle against CAUTI and the potential harm caused by catheter-associated UTIs. Clinicians must be able to:

- Summarize the prevalence and risk factors associated with CAUTI
- Identify when the indwelling catheters are indicated and when they should be removed
- Display proper insertion and maintenance techniques
- Demonstrate how to position and manage urinary catheter equipment, including catheters, lines, and collection bags
- Distinguish between indications for indwelling urinary catheters and intermittent catheterization
- Explain how to collect urine specimens in the presence of a catheter

2. Reducing catheter-associated urinary tract infections: a quality-improvement initiative

AMPLIFIRE

How It Works

Amplifire first measures and classifies a clinician's knowledge in three categories:

Confidently Held Misinformation™:
When a learner is sure they are right, but they are actually wrong.

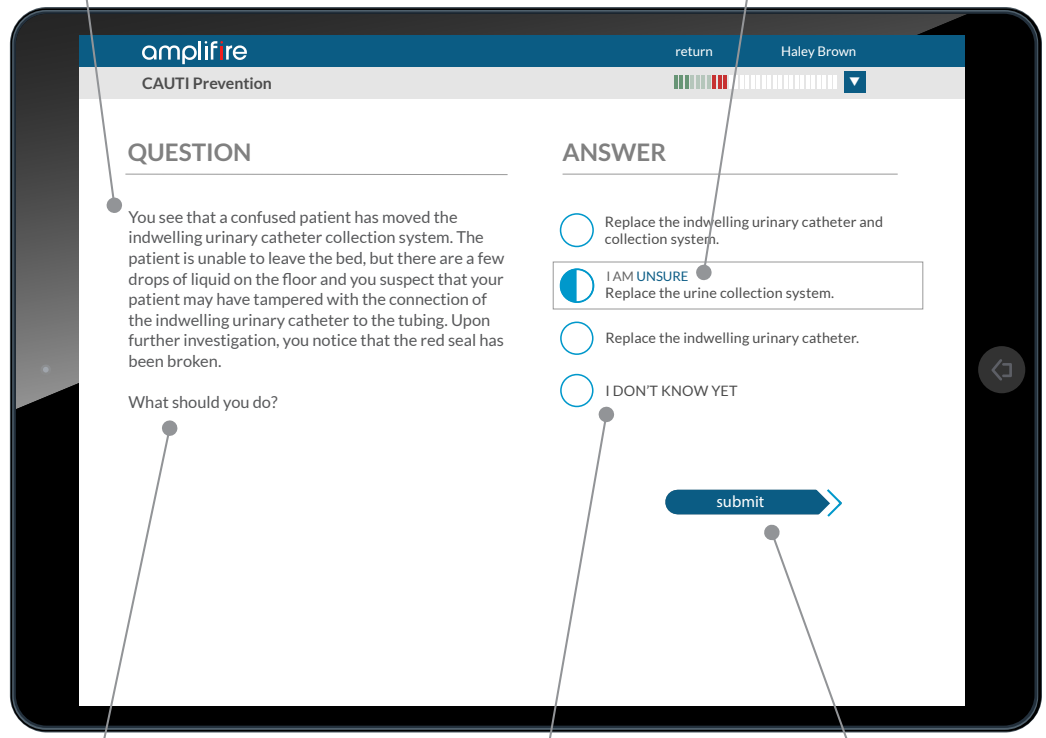
Uncertainty:
When a learner is unsure.

Proficiency:
When a learner is both confident and correct.

Once knowledge is categorized this way, the platform uses triggers from cognitive science to activate learning. It automatically customizes the course in real time for each learner, leading them to rapid proficiency across all topics.

Scenarios and *interactives* simulate real-life. Here, the learner thinks about a common situation that can easily lead to a CAUTI.

Asking about *confidence* causes metacognition (thinking about one's thinking), which drives long-term memory.



Asking questions is a trigger that causes *retrieval, curiosity, and attention*—all drivers of lasting memory.

Learners can be *honest* about their knowledge, helping create the emotional state of "alert," which is optimal for learning.

Feedback will be delayed by a few minutes. This *spacing* boosts the durability of the learning.

EXTREME KNOWLEDGE VARIATION

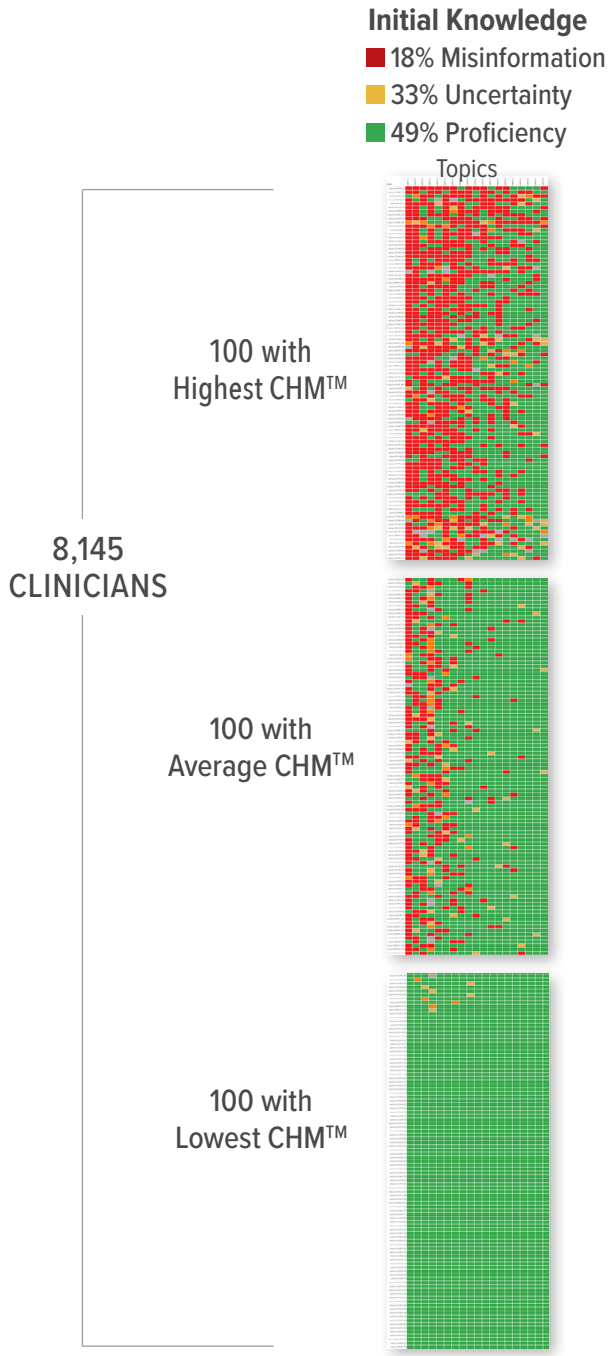
(prior to learning)

This heatmap from Amplifire's reporting dashboard shows the clinical workforce sorted by Confidently Held Misinformation™, uncertainty, and proficiency.

8,145 clinicians generated 154,755 data points.

- 26,308 instances of Confidently Held Misinformation™ were corrected
- 27,855 instances of uncertainty were corrected
- 100,591 instances of existing proficiency

By the end of the course, 100% of staff were proficient (both confident and correct) on all the material.



LEARNING AND INTERVENTION

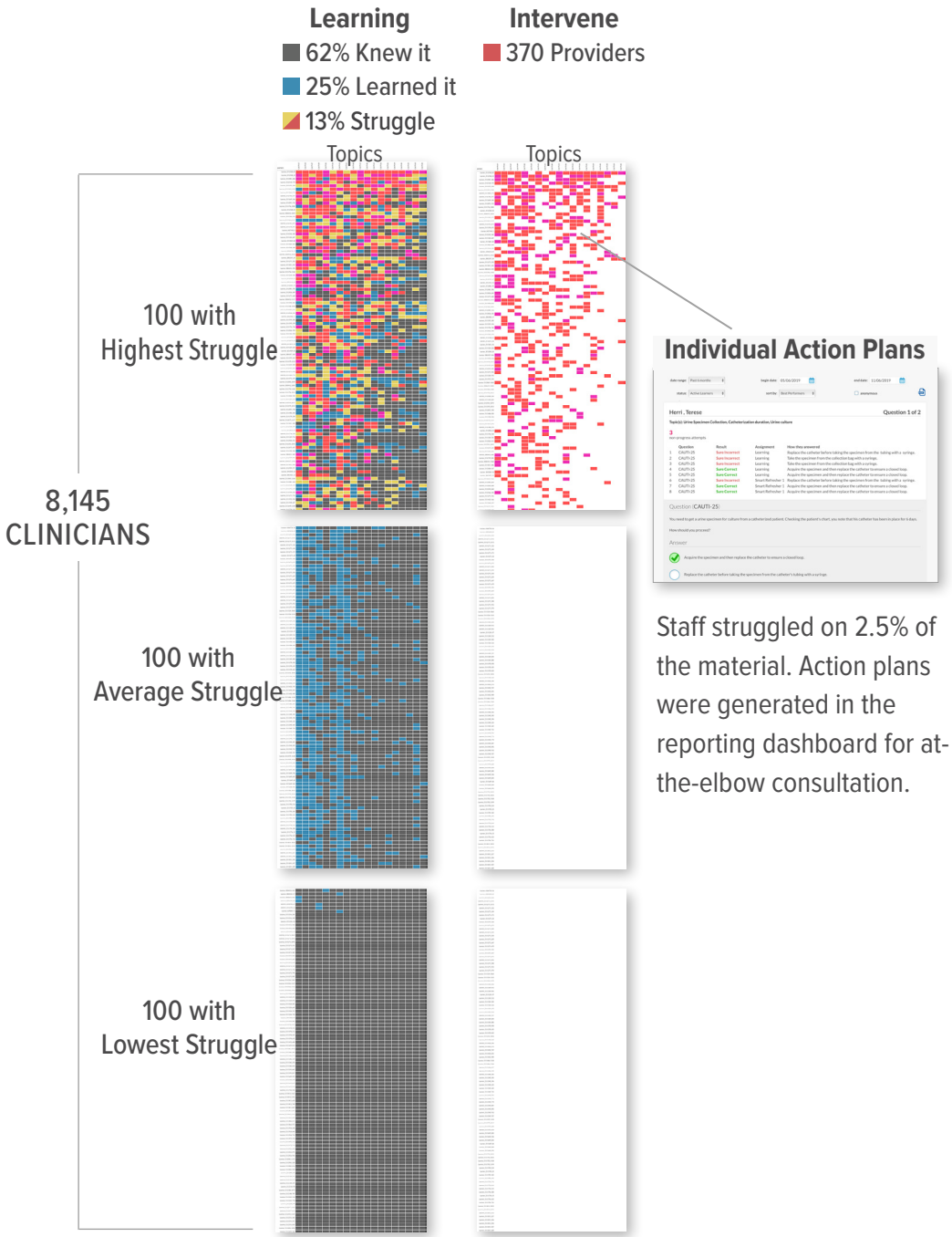
The first heatmap shows that most clinicians already knew much of the material. Where uncertainty and misinformation existed, learning was rapid (previous page).

Struggle to learn occurs when proficiency fails to emerge despite presentation of the needed information. Clinicians may struggle due to temporary on-the-job distractions, or they may be dealing with acute or chronic personal issues.

8,145 clinicians generated 154,755 data points

- 95,948 instances of Already Knew It
- 38,688 instances of Learned It
- 12,265 instances of Low Struggle
- 7,854 instances of High Struggle

For the clinicians who struggled to learn on multiple topics, Amplifire generated individual action plans in its reporting dashboard. Administrators and educators can use these plans for individual at-the-elbow consultations or group webinars that focus on common misconceptions.



Staff struggled on 2.5% of the material. Action plans were generated in the reporting dashboard for at-the-elbow consultation.

RISK COMPARISON BETWEEN PROVIDERS AND RNs

To help make risk visible across an organization, Amplifire ranks topics by confidently held misinformation.

Providers displayed more risk than nurses on the topics of catheter maintenance, timely removal, and inappropriate use.

Topics: Providers

Name	# of Learners	Average Knowledge
Maintenance	2395	
Timely removal	2399	
Inappropriate use	2399	
Diagnostic Stewardship	2399	
Prevention	2399	
Incontinence	2399	
Urine culture	2399	
Catheterization duration	2399	
Pressure Injury	2399	
Bacteriuria	2399	
Equipment	2399	
Risk factors	2399	
Antimicrobials	2399	

Nurses displayed more risk than providers on the topics of antimicrobials, bacteriuria, and urine culture.

Topics : Nurses

Name	# of Learners	Average Knowledge
Antimicrobials	5407	
Bacteriuria	5407	
Urine culture	5407	
Catheterization duration	5407	
Incontinence	5407	
Pressure Injury	5407	
Maintenance	5407	
Prevention	5407	
Inappropriate use	5407	
Timely removal	5407	
Risk factors	5407	
Equipment	5407	

Confidently Held Misinformation™ Uncertainty Proficiency

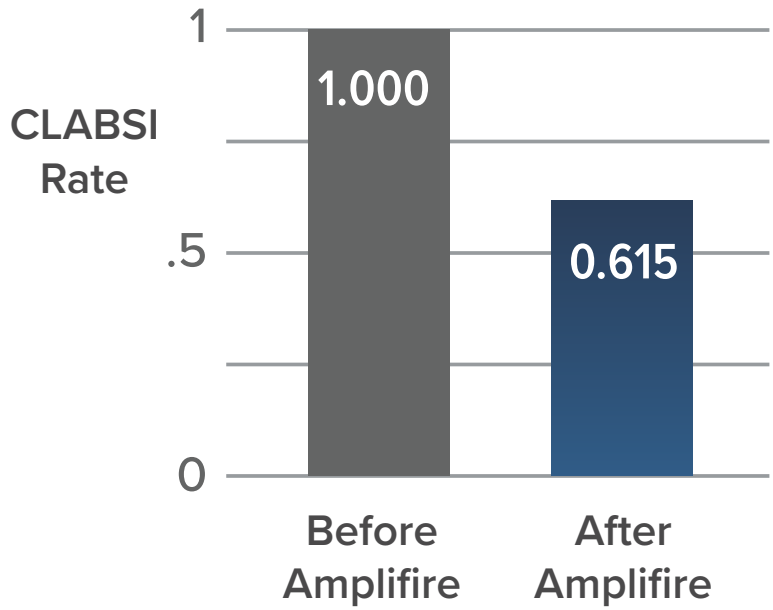
TRAINING RESULT

38% decrease in CAUTI incidents

Going back to 2017, this large hospital was having 1.000 infections per 1,000 catheter days. After Amplifire was deployed, that number dropped to 0.615, which is a 38% reduction.

This effect is statistically significant, with p = .00177. In other words, the odds of a reduction this large occurring by random chance are over 500 to 1.

These numbers are particularly interesting because they were obtained in the time of COVID when staff was spread thin and many patients required extra care.



Comments from Executives

This is a great way to reinforce learning. For learners who struggle with a topic, Amplifire automatically makes the learner study that topic.
– Senior Director, Learning Operations

I appreciate the platform's use and adherence to evidence-based principles grounded in learning science. There are few techniques better at supporting the development of declarative knowledge than test-based learning and spaced retrieval.
– Senior Director

When a learner struggles with a topic, this product, Amplifire, makes them learn it.
– Medical Director

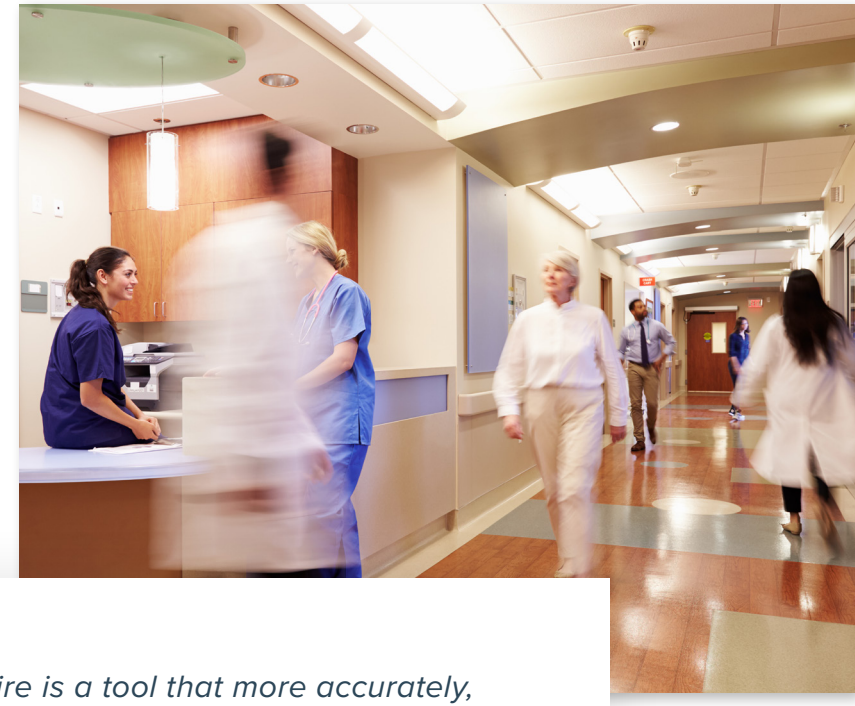
ABOUT AMPLIFIRE

Empirical data shows that caregivers in every healthcare organization posess knowledge gaps, doubts, and medical misconceptions. The Amplifire learning platform tackles these issues using discoveries from cognitive science and algorithms that adapt evidence-based content to the needs of each individual caregiver.

Healthcare organizations embrace Amplifire as a change management tool that transforms training from a rote activity, where administrators can only hope for results, into a strategic activity that delivers measurably better outcomes. Popular course libraries include:

- Clinical Safety and Quality
- Compliance
- EHR
- Obstetrics
- Opioids
- Pediatrics
- Revenue Cycle Management
- Safe Surgery

With more than three billion learner interactions, Amplifire continues to harness scientific research, advanced analytic techniques, and artificial intelligence. Learners experience a faster, more engaging path to proficiency so they can attain their highest potential.



> *“Amplifire is a tool that more accurately, completely, and rapidly loads complex clinical knowledge into expert minds. It gives us not only the ability to transmit knowledge, but the ability to measure how well we transmitted it and how well it stuck.”*
>
> — **Brent James, MD**
> Clinical Professor at the Clinical Excellence Research Center at Stanford University

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