

# How MedStar Health Implemented Experience API to Measure the Effectiveness of Life-Saving Training

## About the Author

With a background in instructional design and development, Andrew Downes creates learning experiences and platforms in both corporate and academic environments. Now, as a learning and interoperability consultant with Watershed, Andrew is a leading thinker in Evidence-Driven Learning and Learning Technologies Interoperability.

An author of the Experience API (xAPI) specification and much of [experienceapi.com](https://experienceapi.com), Andrew is a recognized xAPI expert who has delivered presentations, webinars, and training sessions internationally.

He also maintains a number of open source code projects—including two xAPI-related Moodle plugins—and is a contributor to several other open source projects.

## About Watershed

Watershed is dedicated to changing the world of learning by helping corporate L&D departments get more from their training and development initiatives. This includes the creation of Watershed, a customizable learning analytics platform made possible by a technology called the Experience API (a.k.a., xAPI or Tin Can API).

Watershed connects disparate systems, collects real-time data, and analyzes information in beautiful, easy-to-use dashboards—enabling users to track and measure everything from learner competency to the overall business impact of learning and development programs.

Proving the impact of training is difficult, and most organizations don't have the tools or data they need to get started. Watershed provides not only provides access to all learning and performance data in one place, but also the insights needed to effectively measure and validate L&D investments.

## MedStar Health Simulation Training & Education Lab (SiTEL)

Providing care to more than 500,000 patients each year, MedStar Health is the largest healthcare provider in the Washington, D.C./Maryland region. The Simulation Training & Education Lab (SiTEL) is MedStar's learning solutions and infrastructure organization whose mission is to create an adaptable learning infrastructure and provide resources to meet MedStar's current and emergent learning needs.

## Code Blues

MedStar SiTEL is responsible for training clinicians for Code Blues, emergency situations in which patients are in cardiopulmonary arrest, to ensure the best possible outcomes. During a Code Blue, the stakes are literally life and death—which is why it's vital that MedStar resuscitation team members are well trained. Speed is vital

in the seconds and minutes that follow a Code Blue, including the amounts of time for performing chest compressions and defibrillation and administering medications to a patient.

## Medical vs. Military Training

In medical training, evaluation of training effectiveness is especially important. The real-world tasks clinicians are being trained to perform are high stakes and need to be done right first time. Clinicians can't practice on real patients while they figure it all out; to do so would put lives at risk. Instead, they must reach competency in the training environment, before applying that training in the real world. Not only do the clinicians have to be competent, but MedStar needs to be confident in their competence. Assessments need to be rigorous and effective so MedStar knows which clinicians are ready.

Another unique aspect of medical training is that the skills learnt relate to very practical and physical tasks. Training and assessments, therefore, also need to be practical and physical. While it is important to understand the theory of how the heart works, what really matters is to have the skills to perform the tasks needed to resuscitate the patient.

Military training is similarly high stakes, and officers need to be confident that personnel are adequately prepared for deployment. It also has very practical elements that need to be learnt in the real world rather than in a digital environment.

## MedStar's Key Metrics

MedStar has three key metrics relating to Code Blue situations:

1. **Time to chest:** The amount of time until clinicians start chest compressions
2. **Time to defibrillation:** The amount of time before the patient is shocked with defibrillation equipment
3. **Time to first drug:** The amount of time until the first drug is administered

Medical evidence shows that reducing these times increases the chances of patient survival. MedStar, therefore, targets their training on reducing these times below recommended benchmarks.

## MedStar's Ecosystem

MedStar's training program is made up of three main elements:

1. The Learning Management System manages learner and organization data, and tracks a record of classroom training attended.
2. A mobile app, called Zoll, allows clinicians to practice the steps involved in defibrillation on their own as often as they want to.
3. In situ mock Code Blue simulations enable clinicians to practice resuscitating a medical dummy as a team.

## The Experience API

MedStar used a technology called Experience API to connect these learning applications and bring learning records from all three applications together into Watershed. Experience API, also known as xAPI, is a learning

technologies interoperability specification that offers a common way to connect learning technology products. In the same way that USB provides a common way to connect physical technologies, xAPI provides a common way to connect digital technologies.

Both the SiTEL LMS and mobile application did not have support for xAPI at the start of the project. MedStar worked with the Watershed team to implement xAPI tracking into both of those applications. As the real-world simulations do not have digital components, MedStar implemented a checklist application provided by an Australian company called xapiapps. As the name implies, xapiapps has existing support for xAPI.

## Using xapiapps to track real-world activity

The xapiapps checklist is completed by an observer using a tablet device. The checklist is designed specifically to capture the data needed to evaluate MedStar's key metrics and to identify any reasons why those metrics might not be achieved. The first section records time-based events, including the start of the simulation, the arrival of the team, and each of the three key metric events: CPR, Shock, and Medication. The second section captures known errors that can lead to increased time taken. The observer records these errors as they happen, and then MedStar can report in Watershed on the most common errors.

## MedStar's reporting questions

MedStar uses their data to answer a number of reporting questions. Some of these questions relate to Code Blue simulations, some relate to the mobile app, and others compare the simulations, app, and classroom training.

### Code Blues

- Overall, how are clinicians performing on mock Code Blues?
- Which organizations are the top performers on mock Code Blues?
- How are departments, in particular MedStar organizations, performing on Code Blues?
- Which clinicians haven't participated in mock code blue?
- Which mock Code Blue steps are hard?

### Mobile App

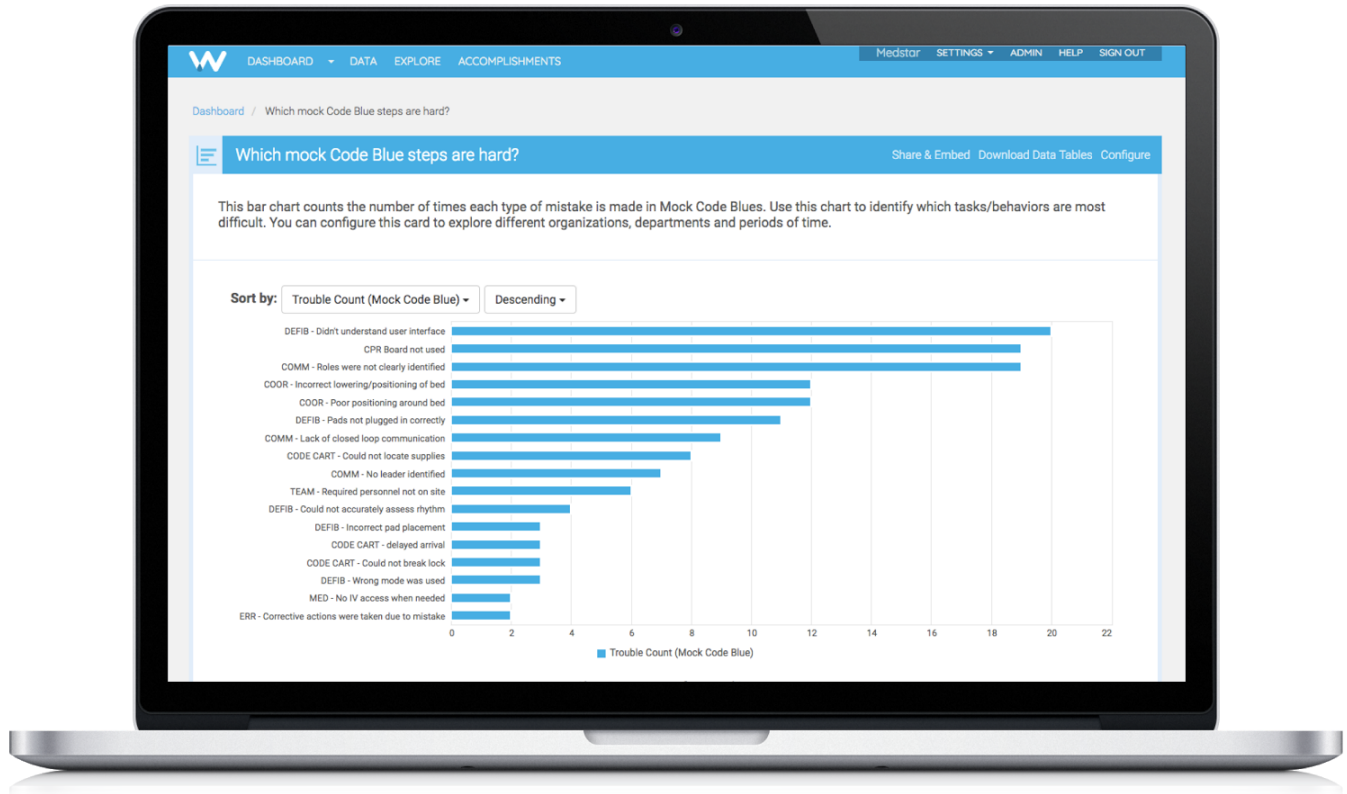
- How many clinicians are using the app?
- How does app activity change over time?
- Which clinicians are the top app users and performers?
- Overall, which steps are clinicians having trouble with?
- Which steps are clinicians having trouble with in each scenario?

## Compare Modalities

- Does app usage affect Code Blue performance?
- Does time between app usage and mock Code Blue affect performance?
- Does the time between LMS course completion and a mock Code Blue affect performance during the mock Code Blue?

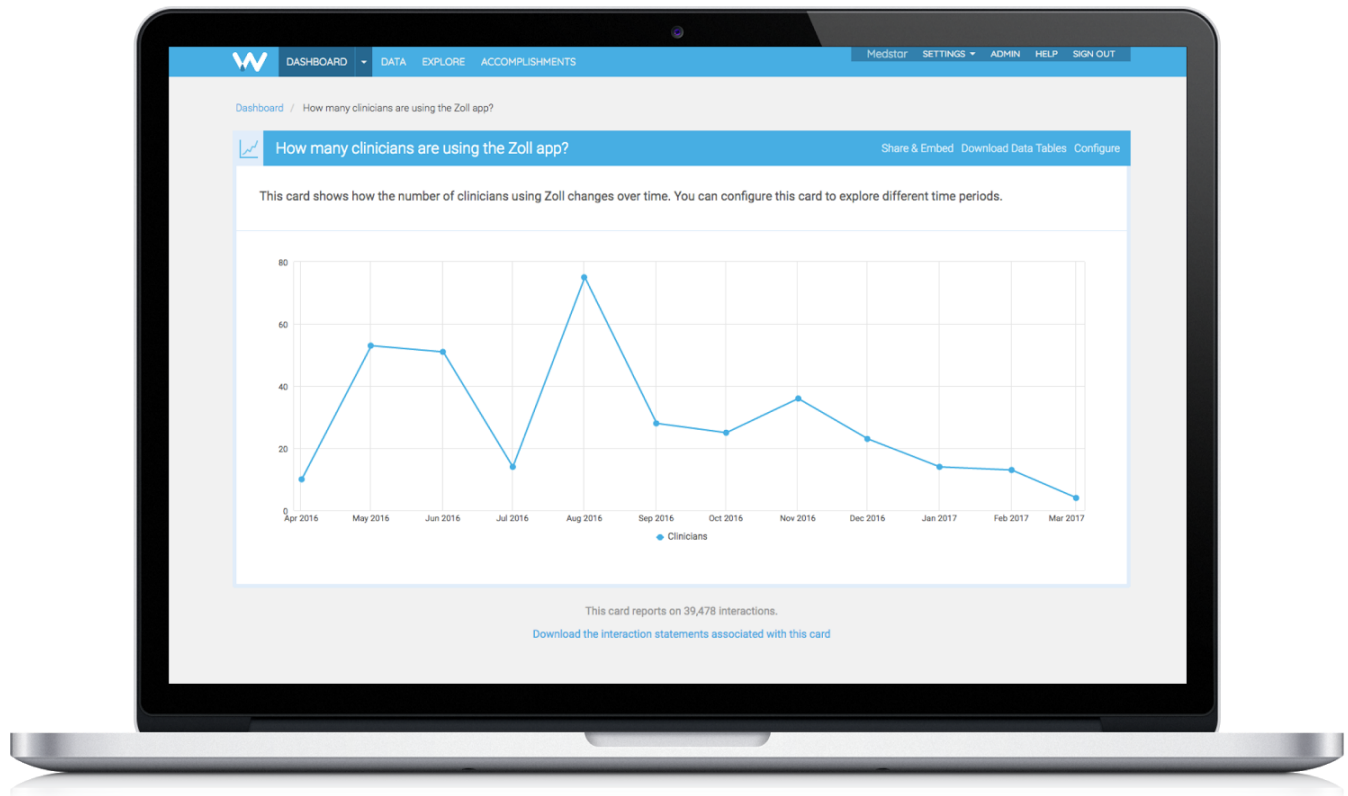
MedStar uses Watershed LRS to explore all of these questions. Let's explore three examples in detail.

# Example Report 1: Which mock Code Blue steps are hard?



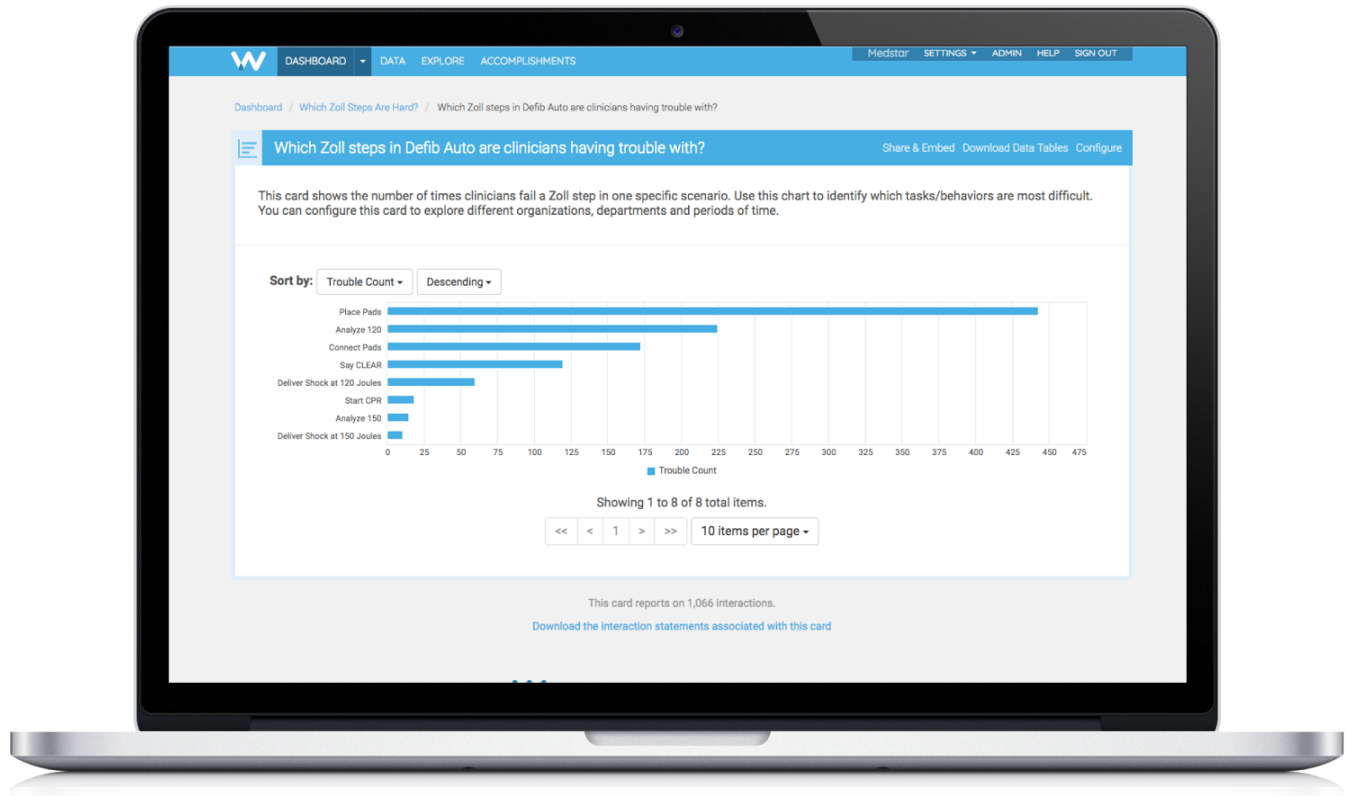
This bar chart report shows the number of times particular errors were made during the mock Code Blue simulations. This clearly shows MedStar where clinicians are having problems, so MedStar can target training to address these issues.

## Example Report 2: How many clinicians are using the Zoll app?



This line chart shows app usage over time by the number of different clinicians using the app each month. MedStar also has a report showing the total number of times the app is used. These usage reports help MedStar evaluate the impact of efforts to promote the app, and guide them on how often these promotional activities need to take place.

## Example Report 3: Which Zoll steps in Defib Auto are clinicians having trouble with?



This bar chart drills down into a particular Zoll app scenario and shows where people are dropping out of the scenario (the scenario ends when the clinician fails a step). As you can see, the first step has a very large drop-off rate for this scenario. This data prompted MedStar to explore further, and they realized there wasn't a knowledge/skills gap. Rather, there was a problem with the app that made the first step difficult to complete.

## Questions and Reflection

I encourage you to take some time to think about how MedStar's case study might apply in your context. In particular, consider the following questions:

- What are the key metrics in your context?
- What does your learning ecosystem look like?
- What reporting questions are relevant to those metrics and that ecosystem?
- What is your first step in applying this in your context?

## Contact

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