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A **Cerebrent Group** Company

# Predictive Precision: The Future of Sepsis Treatment with AI

A transformative UX for a major critical care, AI–enabled solution to predict sepsis in patients, making it easier to take preventive measures and save lives.

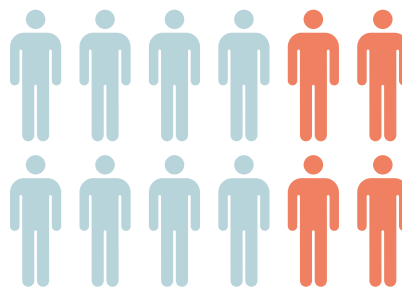**HealthDX**
clarient
healthcare practice

## The Engagement

The critical care landscape faces numerous challenges, with sepsis standing out due to its high morbidity and mortality rates.

In partnership with our client, we embarked on an ambitious project to revolutionize sepsis management in Intensive Care Units, integrating our clients' advanced AI technology with a transformative user experience.

Our HealthDX practice leveraged its deep healthcare knowledge base, personas, heuristic guidance, and understanding of the healthcare technology landscape to develop a groundbreaking solution.

Our team worked with the client to ideate, strategize, design, and develop the UX strategy and user interface to implement the AI–enabled critical care solution. This program has enabled providers to predict sepsis in patients, preparing intensivists and other clinical staff to better manage Sepsis.

## Key Services

### User Research
Researching user needs, behaviors, critical workflows, and pain points in managing sepsis in the critical care setting.

### Interactive Design and UX Flows
Optimizing the user journey's for thousands of interactions with the product every day.

### UI Design + Design System
Crafting relevant and innovative designs that create an impact, delivering the right information, at the right time.

### Interactive Prototyping
Building interactive prototypes for the interface, with extensive user-group testing.

### Front–end Development
We used the React stack to design the front-end for the solution and realize our vision of a seamless, usable, and scalable user interface.

**Sepsis remains a major health problem in ICU patients, worldwide and is associated with high mortality.**



**1.7**million **adults in the U.S. alone develop sepsis, with a 33% mortality rate**

## The Challenge

Sepsis, a critical condition triggered by infection often starting in the lungs, urinary tract, skin, or gastrointestinal tract, poses a significant healthcare challenge. Despite available treatments, the variability in their application and the challenge of early detection hinder effective sepsis management. This inconsistency, coupled with the daunting task of sifting through extensive patient data, exacerbates the risk of delayed intervention and the severe consequences of Post–Sepsis Syndrome (PSS).

Addressing this, our client's AI–powered solution was designed to revolutionize sepsis management by predicting potential deterioration in patient health, enabling timely and uniform treatment interventions.

The project's core aimed to enhance this technology with a user–centric design, improving clinician productivity and patient outcomes by facilitating early detection and streamlined treatment protocols. This innovative approach underscores a commitment to advancing critical care through predictive analytics and intuitive user experiences.

## Contours of the Solution

A Design Thinking Approach to Solving one of Healthcare's biggest challenges

Leveraging a Design Thinking methodology, the Clarient team guided our client through a comprehensive process of ideation, prototyping, and testing, resulting in a solution that has garnered critical acclaim since launch, and has helped improve outcomes by over 18%.

Our journey progressed through dynamic ideation, where brainstorming and workshops led to the generation of innovative, AI-driven solutions and intuitive user interfaces designed for seamless integration into clinical workflows. Prototyping brought these ideas to life, evolving through iterative feedback from healthcare professionals to ensure practicality and impact.

Rigorous testing in real-world ICUs, particularly at leading institutions like Johns Hopkins and Cleveland Clinic, validated the effectiveness and usability of our solution. This helped refine the solution and confirmed its potential to redefine sepsis care.

The success of the solution is a testament to the vision and hard work of the Clarient and client teams, marking a significant leap forward in the quest to improve critical care outcomes and save lives.

### Empathize
**Understanding the Intensivist Experience**

We initiated our project with deep dive research in ICU settings, engaging with clinicians and patients to understand the real-world challenges of sepsis management, and revealing critical insights into the needs of all stakeholders.

### Define
**Clarifying the Problem Statement**

Armed with these insights, we articulated a clear problem statement focused on leveraging technology to enhance early sepsis detection and improve outcomes, setting a focused direction for our innovation efforts.

### Ideate
**Exploring Potential Solutions**

In the ideation phase, our teams brainstormed a wide range of solutions, from AI-driven analytics to user-friendly interfaces, aiming for seamless integration into clinical practices.

### Prototype
**Turning Ideas into Reality**

We turned the best ideas into varied prototypes, iteratively refining them through feedback from healthcare professionals to ensure practicality and efficacy.

### Test
**Validating in Real-World Setting**

Our prototypes underwent rigorous testing in real ICU settings, including Johns Hopkins and Cleveland Clinic, validating their usability and impact on sepsis management.

### Launch & Learn
**Continuous Innovation and Learning**

Following a successful launch, we've embraced continuous learning, constantly enhancing our solution based on clinical feedback to remain at the cutting edge of healthcare innovation.
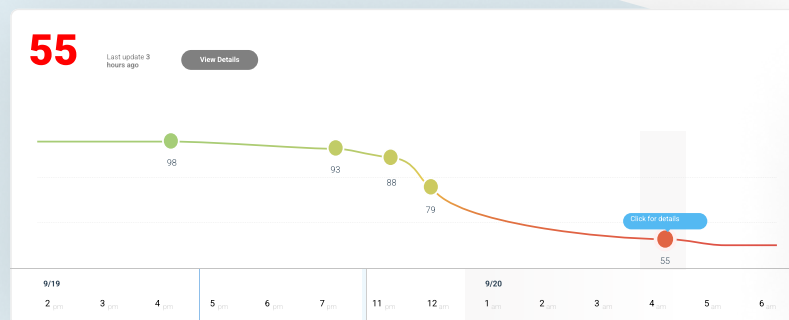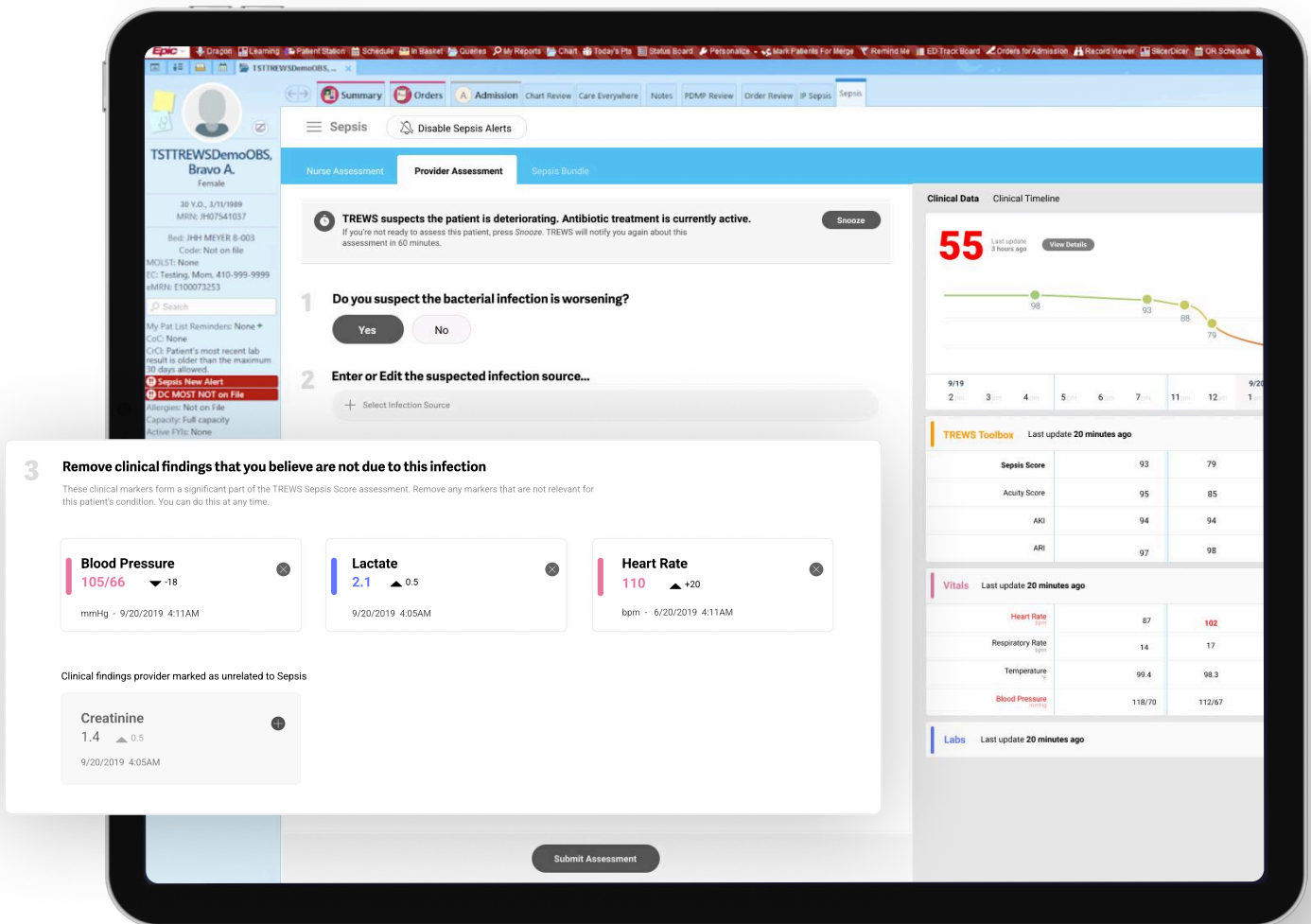
By shifting the focus from reacting to specific symptoms to predicting and preventing patient deterioration, TREWS is not only changing how care is delivered but is also setting new benchmarks for patient outcomes, operational efficiency, and healthcare costs.

This predictive approach embodies the future of healthcare, where technology and data–driven insights pave the way for more proactive, personalized, and effective patient care.

As an AI–based healthcare solution for critical care, the ability of the users to make sense of multiple variables and be able to trust the decision–making was of paramount importance and that's where we came in.

This engagement showcased our ability to deliver high-quality UX, UI, and development services across continents, overcoming the challenges of remote collaboration.

Our work has not only enhanced the client's AI–driven sepsis management system but also demonstrated our commitment to user–centric design and technological excellence.

By focusing on the needs of ICU clinicians and patients, we delivered a solution that is both innovative and deeply rooted in the realities of healthcare services, especially critical care.
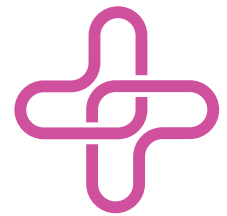
## Key Innovations & Benefits Delivered

### Customizable Clinician Dashboards

Recognizing the diversity in clinicians' needs and workflows, we designed customizable dashboards that present critical patient data and sepsis risk indicators in an easily digestible format. This adaptability ensures that each clinician can quickly access the information most relevant to their immediate needs.
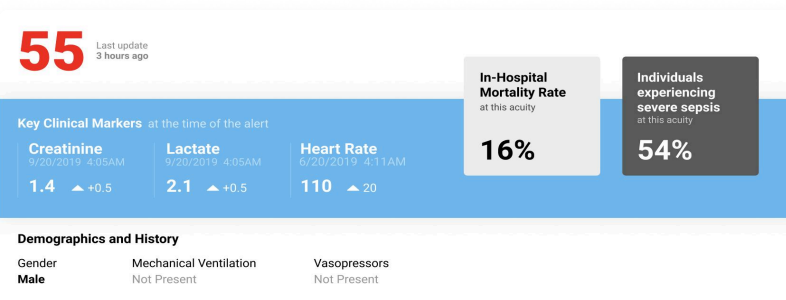


### Real–Time Predictive Alerts

Through meticulous UX research and design, we established a system for delivering real–time alerts about patients at risk of sepsis. These alerts are designed to be both noticeable and informative, providing clinicians with actionable insights without contributing to alert fatigue.

### Integration for Immediate Clinical Actions

Beyond data presentation, the platform facilitates direct clinical actions from within the interface, such as initiating sepsis treatment protocols or ordering specific tests. This capability ensures that insights and alerts translate into prompt, decisive actions, streamlining the care process and enhancing patient response times.

### Monitoring Correlations Between Treatments and Patient Trends

Advanced analytics capabilities allow for the monitoring of treatment interventions against patient parameter trends, providing insights into the efficacy of chosen treatments. This feature aids in understanding the impact of specific interventions on patient recovery, enabling clinicians to tailor treatments to individual patient needs more effectively.

These visualizations help clinicians quickly identify trends or deviations that may indicate the onset of sepsis, supporting early diagnostic and treatment decisions.

### Data–informed Care Decisions

The system aggregates and presents patient data from various sources in a cohesive, easy–to–navigate interface. This consolidation includes real–time vitals, historical health records, and predictive insights, all curated to provide a comprehensive overview that supports informed, data–driven care decisions.

### Responsive and Accessible Interface

The UI design prioritizes responsiveness and accessibility, acknowledging the fast–paced and varied nature of ICU settings. Clinicians can access the system across multiple devices, ensuring critical patient data is always at their fingertips, regardless of their location within the hospital.

### Seamless EMR Integration

The solution is engineered for deep integration with existing Electronic Medical Record systems, ensuring that clinicians have uninterrupted access to comprehensive patient data alongside predictive insights. This integration supports a unified view of patient status, medical history, and real–time alerts, all within the clinicians' habitual working environment, thereby enhancing user adoption and efficiency.

### In–built Structure for AI Model Feedback

A unique feedback loop allows clinicians to directly influence the AI model's learning process. By reporting the accuracy of alerts and outcomes of interventions, users contribute to refining the model's predictive capabilities. This continuous learning mechanism ensures the system evolves to meet the changing dynamics of sepsis diagnosis and treatment.

# The future of healthcare is digital.
# And, we're here for you.

In these times, hope is all we have. This hope is what keeps us going day after day, achieving the impossible, helping us all get through the darkest of nights. And yet, we need to have more than hope to meet the challenges of modern healthcare.

At Clarient, we work with hospitals, medical practitioners, health–tech companies, and healthcare organizations to enhance service delivery, drive innovation, improve outcomes and enhance patient experience. From saving lives in ICUs and helping hospital administrators predict capacity to outcome–focused healthcare services and products, our clients trust us with their healthcare system design and development needs.

Whether you're bringing an innovative healthcare product or service to market or reengineering processes and systems at scale, we are a partner you can trust. Reduce time–to–market, supercharge innovation, and get that smile back on your patients' faces.

**At Clarient, we are always looking out to make this world a better place and create a healthier tomorrow. Get in touch with our healthcare solutions team today. Let's design what's next in healthcare together!**

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