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Executive Summary



Sepsis represents a significant clinical and financial burden across NHS hospitals. Early identification and standardized intervention can substantially reduce ICU admissions, complications, and overall length of stay. Beyond the measurable outcomes, sepsis inflicts considerable distress on patients and families, often resulting in long-term physical and psychological harm. For clinical teams, delayed recognition and escalation contribute to avoidable strain, emotional burden, and workflow disruption. This white paper outlines the anticipated benefits of implementing the Orbis Electronic Patient Record (EPR) system for sepsis care. In this white paper we explore how Orbis modules, integrating digital NEWS2 assessment(1,2), clinalytx Medical AI (risk predictor Medical Device)(3), real-time order communications (CPOE)(4), and intelligent documentation, could improve guideline adherence, reduce progression to septic shock, and generate measurable cost savings.



Background and Problem

Sepsis is a life-threatening condition that arises when the body's response to infection causes injury to its own tissues and organs (5). Sepsis causes 5 deaths every hour in the UK (about 44,000 deaths annually) (6). It is a more common reason for hospital admission than a heart attack and has a higher mortality. The UK Sepsis Trust estimates that there are some 100,000 hospital admissions for sepsis each year, with an average cost of about £20,000. Just following basic principles such as timely sepsis recognition, administering antibiotics and lactate measurement within 1 hour, and completing the Sepsis Six bundle, could save £4,000 per episode. These savings are due to shorter ICU stays, avoided ICU admissions, and reduced complications. In addition to cost reduction, early intervention improves patient outcomes, reduces the risk of long-term disability, and alleviates pressure on critical care resources. The total potential cost saving, even after accounting for increased costs related to improved survival, is estimated at £196 million per year. (7). Delays in recognition and inconsistent adherence to guidelines like the Sepsis Six bundle (8) contribute to excess ICU admissions, prolonged hospital stays, and elevated mortality.



The Role of Orbis EPR in Sepsis Care

Orbis offers a modular and integrated EPR platform that includes predictive analytics to identify patients at risk of developing sepsis (via clinalytix Medical AI) and real-time alerting to clinicians through mobile or handheld devices (via Info4U), faster documentation using ORBIS Speech, and structured coding through MedCo.

Here is a brief definition of the key **Orbis modules** used in sepsis management:

- **clinalytix Medical AI:** An artificial intelligence engine that analyzes patient data (e.g., vitals, labs, history) in real time to detect indicators of risk of developing sepsis. As a medical device in use for sepsis predictors, clinalytix Medical AI supports proactive decision-making by flagging patients before visible symptoms escalate.
- **Info4U:** Orbis in your hand, Info4U enables clinicians to have access to the EPR on a handheld device, meaning they can access clinical information at the point of care.
- **CPOE:** The order communication system in Orbis that allows clinicians to quickly place bundled diagnostic and treatment orders (e.g., blood cultures, lactate, IV antibiotics) with a few clicks. It can potentially reduce time to treatment and eliminates manual data entry errors.
- **Speech:** A voice recognition and structured documentation module that enables clinicians to dictate notes, assessments, and discharge summaries directly into the EPR. It supports fast, hands-free, and codified documentation. In addition, ambient speech functionality, already deployed in parts of the DACH region, can passively capture the full clinical conversation between clinician and patient, automatically extracting and summarising relevant information, such as history, assessments, orders, and next steps. This enables clinicians to focus on the patient while reducing post-consultation documentation workload.



- **Sepsis workflow:** Orbis contains intelligent Clinical Decision Support (CDS) within the standard content delivered to all NHS customers. When a patient has an EWS (NEWS2, MEWS, PEWS etc) completed, if they hit a trigger in any of their scores for a sepsis screen the clinician is given a recommendation to complete the SEPSIS 6 screen and a link to the assessment is also provided. Any patient who requires a sepsis screen, is at risk of sepsis or who is on the sepsis pathway is viewable to the sepsis team and critical care team and the direct care team in dashboards, as well as all clinicians involved with a patient's care.

These features align with NICE recommendations (9) for administering antibiotics and lactate testing within 1 hour and completing the Sepsis Six bundle. The sepsis management pathway can be divided into several phases, ranging from early detection and screening to discharge and post-discharge quality review. Table 1 outlines each phase, the associated clinical activities, corresponding Orbis interventions, and the expected impact.

Table 1: Sepsis clinical pathway and Orbis intervention points

Pathway Phase	Clinical Activities	Orbis Module Interventions	Expected Impact
Early Detection & Screening	Clinical suspicion of infection Due to multi factors including NEWS2 score monitoring	clinalytix Medical AI: Predictive deterioration alerts Info4U: Real-time NEWS2 alerts	Early identification of at-risk patients before clinical deterioration, allowing for less critically ill patients with sepsis
Initial Assessment	Physical exam Lab test orders (e.g., lactate, CBC, CRP) Blood cultures	CPOE: Order set simple ordering of Sepsis risk diagnostics Orbis: Auto-launch of sepsis pathway and visibility of at risk and patients with sepsis to the CCC.	Faster diagnostic work-up Compliance with one hour bundle targets
Diagnosis & Bundle Initiation	Administer IV antibiotics Begin IV fluids Oxygen therapy Document time-zero ¹	CPOE: Fast-track antibiotic and fluid prescribing Orbis Speech: Voice-to-text for rapid documentation	Bundle delivery within 1 hour, time stamping for audit and billing compliance
Escalation or Stabilization	Reassess response- Consider ICU transfer or continue monitoring	clinalytix Medical AI: Reassessment scoring	Timely escalation to ICU only when necessary, reduces unplanned ICU transfers
Ongoing Management	Monitor urine output Repeat lactate Document interventions	Orbis Speech: Hands-free updates to progress notes	Enhanced continuity of care, supports ongoing audit and outcome tracking
Recovery or Transfer	Step-down from ICU Prepare discharge summary Handover to GP	Orbis Speech: Rapid discharge summary creation	Enhanced continuity of care, supports ongoing audit and outcome tracking
Quality Review & Audit	Review bundle compliance Track missed cases Monthly governance audit	Orbis Dashboards: Real-time analytics of sepsis bundle completion and time-to-intervention	Continuous quality improvement and trust-level governance compliance

¹ Time-zero is the timestamp when sepsis is first suspected and documented, initiating the 1-hour bundle timeline.

Expected Clinical Outcomes (Hypothesis-Based)

Based on clinical assumptions derived from the combined features and functionalities of various Orbis modules, the system could help achieve the following outcomes in NHS settings:

- **Reduce time to antibiotics**
- **Decrease ICU transfers**
- **Decrease mortality**
- **Reduce Length of Stay (LOS)**
- **Increase compliance with Sepsis Six bundle**



Financial Impact Hypothesis (NHS Trust Example)

To estimate the potential economic benefit of using Orbis EPR to improve sepsis management, we modeled a typical NHS Trust with approximately 1,000 annual sepsis cases. ICU admission rates among sepsis patients vary by setting and severity but can range from 25% to over 60% (10–12). Delayed recognition or transfer to ICU is associated with worse outcomes, especially in high-risk subgroups. Let's take a conservative estimate and assume that 25% of patients would require ICU admission, resulting in 250 ICU admissions per year. Studies in the literature show that a machine learning-based prediction model could reduce the ICU transfer rate to 4.7% (13). Without early EHR alerting, approximately 25% of similar patients would have progressed to ICU, then this suggests that alerts in the study were triggered in patients who would otherwise have been escalated. However, only 4.7% required ICU admission. Therefore,

ICU Admission Reduction:

$(25\% - 4.7\%) / 25\% \times 100 = 81.2\%$

This indicates an estimated 81.2% reduction in ICU admissions due to early detection and intervention enabled by the EHR-based alerting system.

Let's be conservative again by assuming that Orbis implementation leads only to a 10% reduction in ICU admissions through earlier detection, timely intervention, and reduced progression to septic shock. Therefore, 25 ICU ad-

missions could be avoided annually. This estimate is based on published evidence showing that early warning systems and electronic sepsis alerts can improve timely treatment delivery and reduce clinical deterioration (14,15). While published studies do not consistently quantify ICU admission reductions, a 10% figure is used here as a conservative and clinically plausible assumption for modelling purposes. It reflects achievable improvements observed in pilot studies involving digital sepsis pathways.

With an average ICU cost of £2,000 per day and an average ICU length of stay of 7 days, this reduction translates into £350,000 in direct cost savings from ICU care avoidance.

However, these patients would still require ward-level care. Shifting those 25 patients to a general ward (at £500 per day for an average 6-day stay) would incur £75,000 in additional ward costs. Therefore, the cost of £350,000 less the calculation of additional Ward costs of £75,000 suggests a combined saving of £275,000 per annum.

Importantly, this intervention would also increase revenue to the Trust. Assuming an average NHS payment of £7,000 per sepsis admission (based on Mixed HRG coding), these 25 ward-treated cases would generate £175,000 in revenue. Compared to their ward cost, this represents a net gain of £100,000 in revenue.

Net Financial Impact

The savings illustrated are almost certainly a conservative estimate of economic benefits arising from the application of Orbis, underrepresenting the full impact of patient outcomes on social and health-related costs. To consider a full benefits analysis, other factors to consider would include:

- Identification of locally negotiated tariffs with a differential payment for care of sepsis-admitted patients in different settings (e.g., in ICU vs Hospital Ward), which could impact acute setting revenue.
- Early intervention in the identification and care of patients with sepsis will likely impact length of stay in the acute setting. This would be applicable for both the remaining number of critically ill patients admitted to the ICU and those admitted to wards. Using the assumptions referenced above and remaining 90% of patients admitted to ICU and 110% of patients admitted to wards, reducing length of stay by 1 day for each patient, could realise a further **£837,500** of savings per annum (ICU: $250 - 25 = 225 \times £2,000$ day cost saved = £450,000. Wards: $750 + 25 = 775 \times £500$ day cost saved = £387,500).
- ICU capacity for non-sepsis episodes of care would be increased, reducing waiting times. Releasing ICU beds allows other critically ill patients to receive specialist care and better health and social care outcomes. Increased activity also increases receipt of additional PBR tariff payments.
- Improved outcomes arising from early diagnosis and appropriate care in the appropriate setting potentially reduce readmission rates and the societal cost of managing adverse long-term conditions arising from sepsis.



Conclusion

The Orbis EPR system has strong potential to improve sepsis care in NHS hospitals through early alerts, automated workflows, and structured interventions. While this white paper is hypothesis-driven, the anticipated clinical and economic outcomes justify piloting Orbis as part of a sepsis management strategy. A full post-implementation evaluation is planned to validate these projections. We recommend piloting Orbis EPR's sepsis modules in at least one NHS Trust and evaluating outcomes over a 6 - 12 months period using the proposed clinical and economic metrics.



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