

# Reducing the blood culture contamination rate in the Emergency Department: a good start

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## BACKGROUND

- Blood culture is the primary diagnostic test available to detect bloodstream infection<sup>1</sup>, however contamination during collection remains a significant issue
- Contamination complicates clinical interpretation, and can have significant clinical and financial consequences, including unnecessary antimicrobial treatment, increased length of hospital stays, and escalating healthcare costs<sup>2,3</sup>
- Current guidelines recommend that blood culture contamination rates should not exceed 3%, with a goal of 1% when best practices are followed<sup>2,4</sup>
- In Q1 of 2024, Beaumont Hospital (Dublin, Ireland) Emergency Department had a median contamination rate of 10%
- Kurin Lock<sup>®</sup> blood culture collection sets divert the initial 0.15ml of blood drawn (which may contain contaminants from the patient's skin) into a flash chamber
- The device is easy to use, with minimal training required, and costs approx. £20
- Clinical trial evidence suggests that Kurin Lock<sup>®</sup> is a safe and effective way of reducing blood culture contamination rates, compared with standard blood culture collection<sup>5</sup>

Venipuncture Collections



Freshly Placed Peripheral Catheter Collections



Figure 1: Kurin Lock<sup>®</sup> device - can be used both for venipuncture and freshly placed peripheral IV catheter blood culture collection

## OBJECTIVES

- **Aim of the quality improvement project:** reduce blood culture contamination rate in Beaumont Hospital ED by implementation of Kurin Lock<sup>®</sup> device for blood culture collection

## METHODS

Kurin Lock<sup>®</sup> introduced on pilot basis  
(8<sup>th</sup> May to 2<sup>nd</sup> July 2024)

130 ED healthcare workers (HCWs) trained in device use

HCWs document blood culture collection

- Complete and sign Kurin<sup>®</sup> form
  - Affix patient label
- Deposit form in collection bucket

Weekly form collection and data entry

- Forms collected and processed
- Data (date and time of blood culture collection, HCW name, patient episode number) entered into Excel

Incentive

- Restaurant voucher awarded for most Kurin<sup>®</sup> blood cultures collected

Blood culture contamination data sourced from Beaumont surveillance database

Weekly comparison of contamination rates

- Kurin<sup>®</sup> vs Traditional Method
- Contaminants determined by Clinical Microbiology Team

## RESULTS

- A total of 768 blood cultures were collected in ED over 8 weeks (see figure 2)
- The contamination rate was significantly lower with the Kurin<sup>®</sup> Lock (2.71%) compared to the traditional method (10.4%) ( $\chi^2 = 12.41$ ,  $df=1$ ,  $p= 0.0004$ )
- Staff adherence to using the Kurin<sup>®</sup> Lock averaged 28.38% (range: 16%-46%) (see figure 4).

	Contaminated	Non-contaminated	Total	Contamination rate
<b>Traditional Method</b>	57	490	547	<b>10.4%</b>
<b>Kurin<sup>®</sup> Device</b>	6	215	221	<b>2.71%</b>
<b>Total</b>	<b>63</b>	<b>705</b>	<b>768</b>	

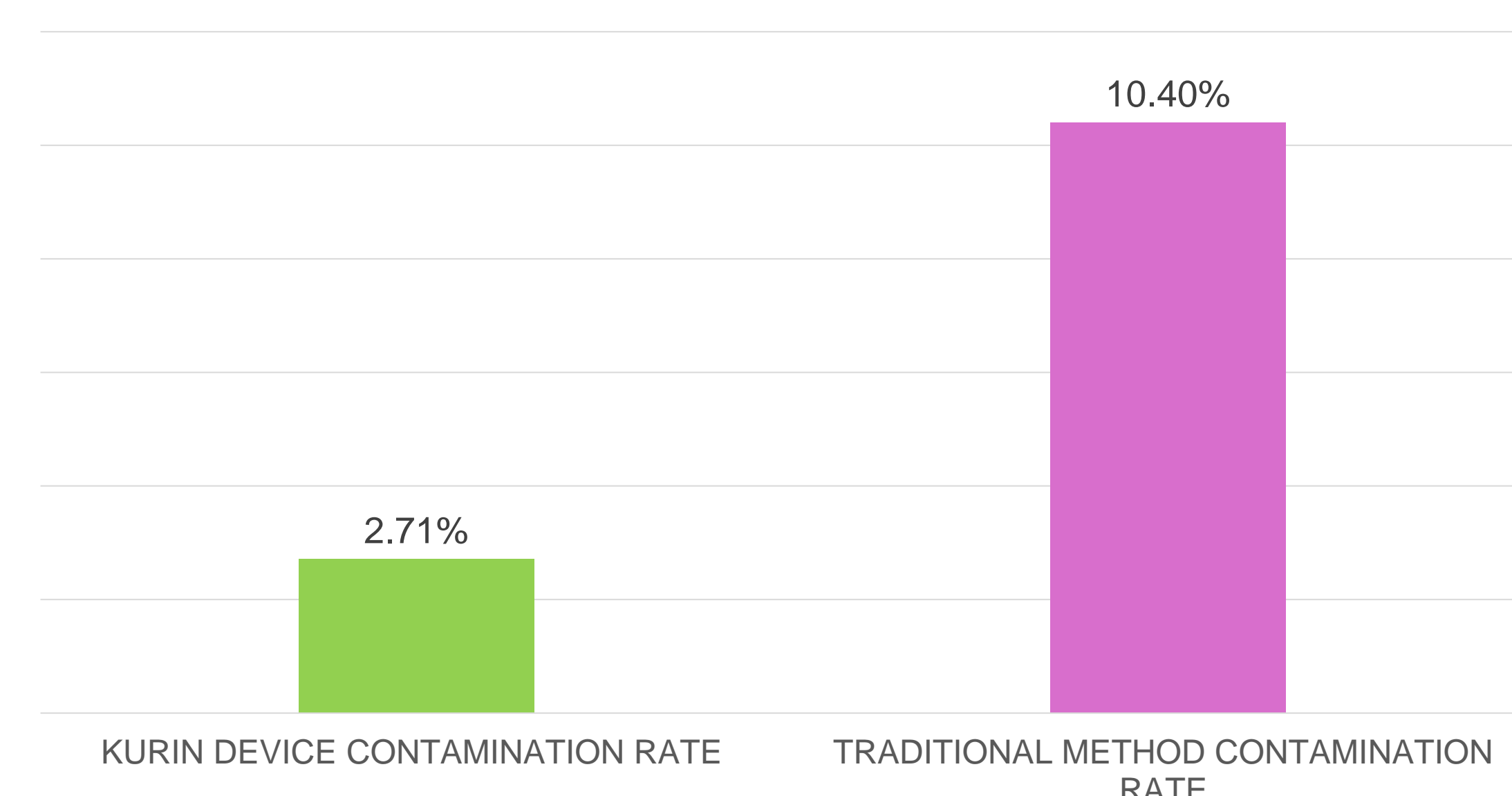


Figure 2 and 3: contamination rates taken using Kurin<sup>®</sup> Lock and using traditional methods

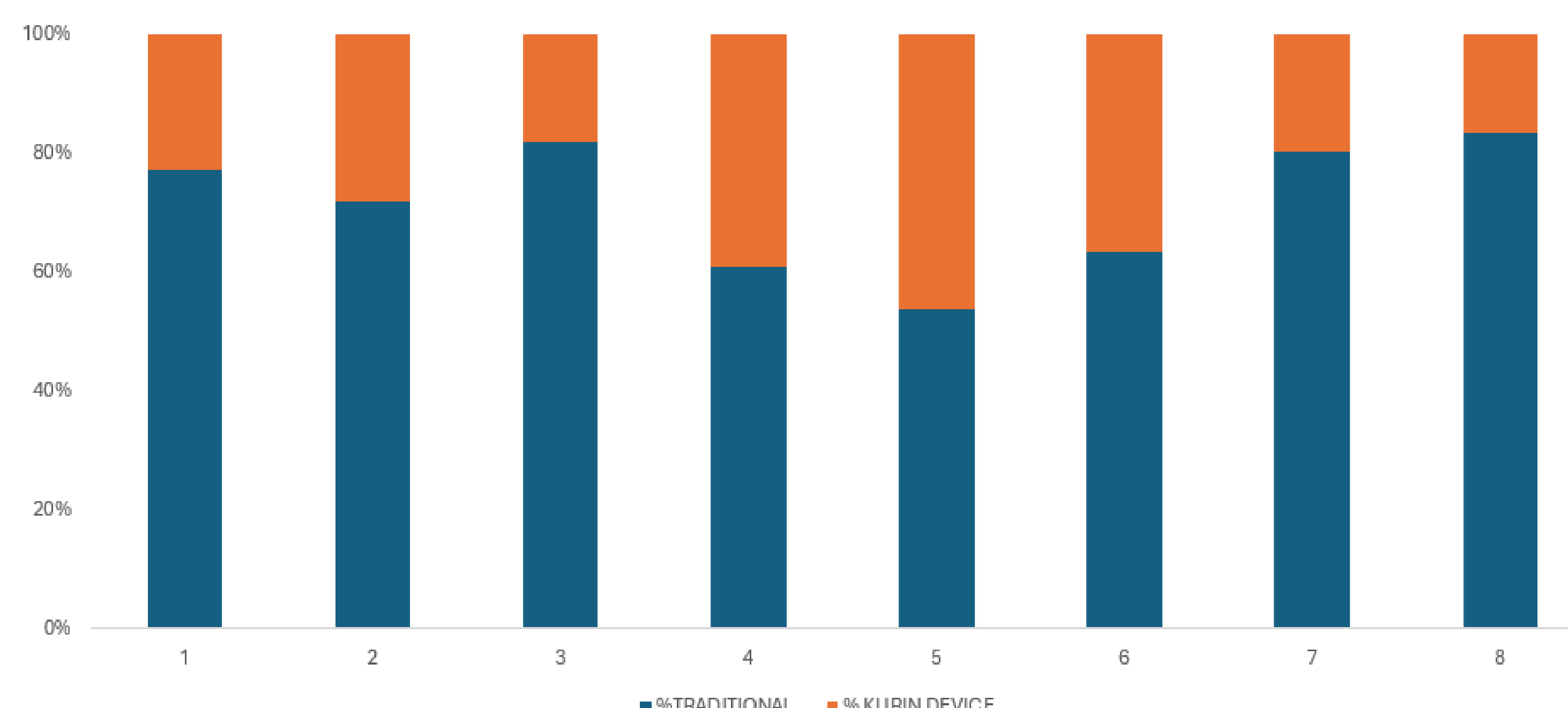


Figure 4: Proportion of blood cultures taken using traditional methods (blue) and Kurin<sup>®</sup> Lock (orange) each week

## DISCUSSION

- Implementation of the Kurin<sup>®</sup> Lock in Beaumont Hospital ED resulted in a significant reduction in blood culture contamination rates compared to the traditional collection method.
- NICE guidelines<sup>5</sup> (2024) recommend the Kurin<sup>®</sup> Lock to reduce blood culture contamination in emergency departments
- Following the pilot trial, a business proposal for permanent adoption of the Kurin<sup>®</sup> Lock was developed and approved, leading to its formal implementation in Beaumont Hospital ED in March 2025.
- Economic modelling suggests a high probability of cost savings when used in EDs with baseline contamination rates >9%, with previous estimates indicating potential savings of ~£5,000 per contaminated blood culture<sup>6</sup>.
- Despite its benefits, low adherence to Kurin<sup>®</sup> Lock use among ED HCWs was a key challenge in our pilot trial
- To address this, an ED staff survey and feedback session could identify barriers. Targeted education, training, and incentivisation for ED doctors, nurses, and staff could improve adherence. Involving the phlebotomy and IV cannulation teams in blood culture collection may streamline and standardise the process, maximising impact.

## REFERENCES

- 1) "Investigation of blood cultures (for organisms other than Mycobacterium species)" (*UK Standards for Microbiology Investigations*, PHE 2019)
- 2) Doern, GV *et al* "Practical Guidance for Clinical Microbiology Laboratories: A Comprehensive Update on the Problem of Blood Culture Contamination and a Discussion of Methods for Addressing the Problem". *Clinical Microbiology Reviews* 2020; Oct 30;33(1)
- 3) Palavecino, EL *et al* "Laboratory approaches to determining blood culture contamination rates: an ASM Laboratory Practices Subcommittee report". *Journal of Clinical Microbiology* 2024; Feb 14;62(2)
- 4) CLSI. *Principles and Procedures for Blood Cultures*. 2<sup>nd</sup> Ed. *CLSI Guideline M47*. Clinical and Laboratory Standards Institute; 2022.
- 5) "Kurin Lock for blood culture collection" (*NICE guidance*, April 2024)
- 6) Alahmadi, YM *et al* "Clinical and economic impact of contaminated blood cultures within the hospital setting". *Journal of Hospital Infection* 2011; Mar 77(3):233-6