

Development of a Clinical Decision Support Tool for Improving Blood Culture Utilization and Facilitating Sepsis Diagnosis

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1 Background

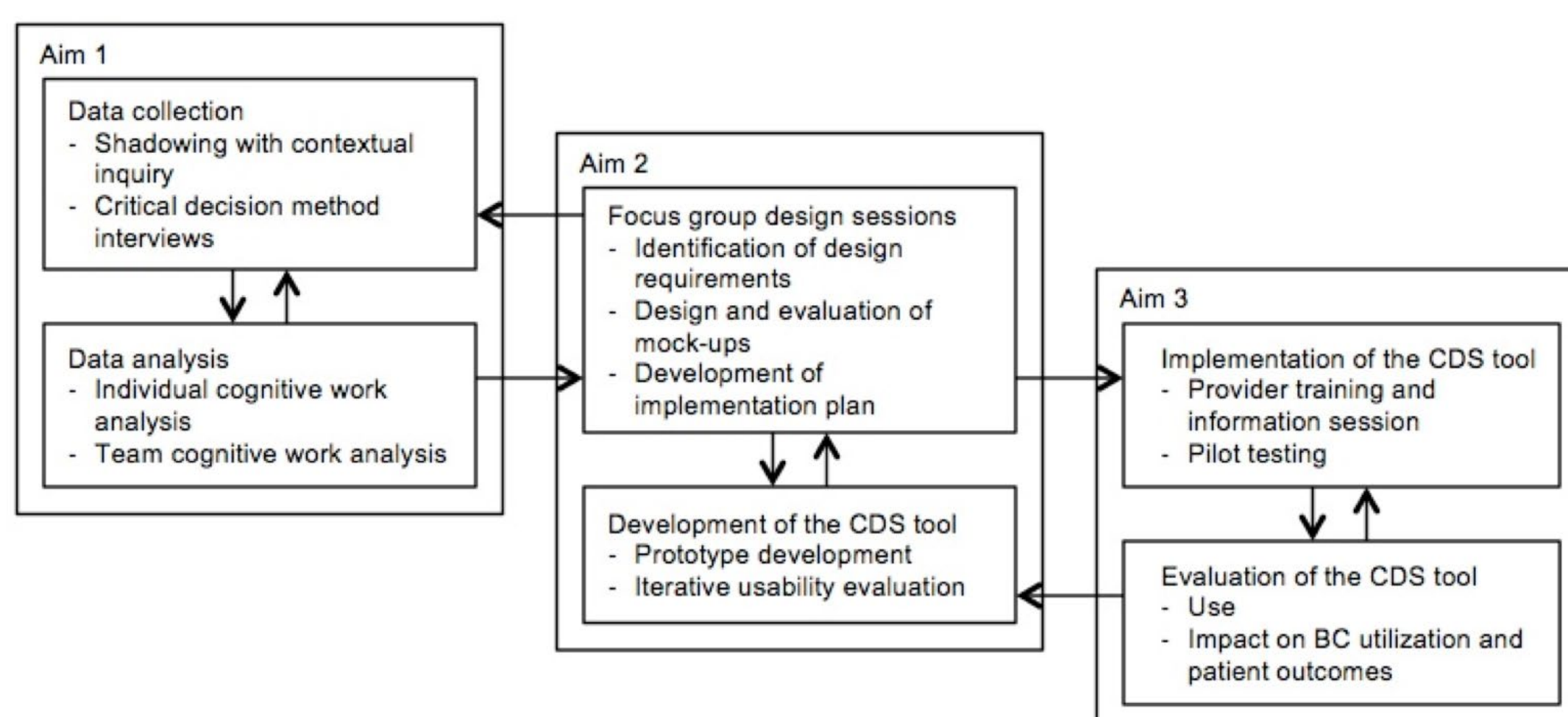
- Sepsis is a life-threatening complication of blood stream infections. Because of the high mortality rate of sepsis, risks of under-diagnosis and under-treatment, and concern for inappropriate antibiotic use, clinicians often order blood cultures (BCs) liberally.¹
- The overuse of BCs has been shown to result in additional laboratory tests, unnecessary antibiotic use, prolonged hospitalization, and increased healthcare costs.^{2,3}

2 Objectives

Overall Goal: To develop an electronic health record-based clinical decision support tool to optimize blood culture use

- Understand individual and team cognitive processes and workflow elements that influence BC ordering
- Develop and implement a Clinical Decision Support (CDS) tool
- Evaluate the use and impact of the CDS tool

3 Methods



5 Conclusions

The decision to order a blood culture is a complex cognitive process, which is approached by providers in different ways based upon many different factors. Some of these factors include the clinical indicators that are available at the time of decision and orders from other providers to order a BC. Level of experience and suspicion that something is wrong go hand in hand, and are also important factors that affect the decision-making process.

4 Results

Below is two weeks of chart review data. From this, we select interesting cases from each category and interview the corresponding providers who were caring for those patients

06-16-17 to 06-22-17					
Category	1		2		3
Sub-category	Fever/BC+	Fever/BC-	No Fever/BC+	No Fever/BC-	Fever/No BC
Number of Cases	0	7	2	7	26

06-23-17 to 06-29-17					
Category	1		2		3
Sub-category	Fever/BC+	Fever/BC-	No Fever/BC+	No Fever/BC-	Fever/No BC
Number of Cases	0	9	0	8	27

Categories:
 1=BC and fever/hypothermia
 2=BC, no fever/hypothermia
 3=No BC, fever/hypothermia

Interview Progress

- Ten Completed Provider Interviews:** 1 Attending, 4 Fellows, 1 Resident, 1 Nurse Practitioner, 2 Nurse Managers (10-15 additional interviews to be conducted)
- Main themes identified:**
 - Experience level (information seeking, integration, interpretation): Intuition seems to build with more experience
 - Reasons for ordering BC: Analytical (elevated temp, not responsive to fluids) vs. naturalistic ("This patient looks really sick.") decision making
 - Sources of information: Family, EPIC, Nurses, Clinical Data
 - Teamwork: Consults with other providers to confirm decision to order BC, patient/family information

7 References

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- Bates DW, Goldman L, Lee TH. Contaminant blood cultures and resource utilization. The true consequences of false-positive results. *JAMA*. 1991;265(3):365-369.

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6 Future Directions

Additional interviews with providers and nurses must be conducted in order to better understand the cognitive process that happens when deciding whether or not to order a blood culture.



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