EXPLORING END USERS’ SYSTEM REQUIREMENTS TO A HANDHELD COMPUTER SUPPORTING BOTH SEPSIS TEST WORKFLOW AND CURRENT IT SOLUTIONS

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BACKGROUND

• Bloodstream infections is in most patients associated with a clinical systemic response called sepsis.

• Sepsis is a global healthcare burden.

• For patients admitted to the ICU with sepsis the mortality ranges from 27% to 54% depending on the degree of sepsis severity. [1]

BACKGROUND

- “.. the speed and appropriateness of therapy administered in the initial hours after severe sepsis develops are likely to influence outcome.” [1]

- MultiplexBCT is a blood culture tests, which aims to identify the most prevalent blood culture pathogens in less than an hour.

- The mobility offered by a tablet-based computer system may help facilitate a rapid responses required in healthcare.

STUDY OBJECTIVE

.. to investigate the necessary system requirements for a tablet-based data entry and reporting system, which can support the workflow during analysis of blood cultures.
METHOD

Data collection:

- Observational study conducted at the Department of Clinical Microbiology at Aalborg University Hospital, Denmark.
  - Provides diagnostic microbiology for about 580,000 inhabitants of the North Denmark Region.

- Use of semi-structured interviews to support the observational study.

- Five observations for a total observation time of 13 hours and 30 minutes.

- Two interviews of approximately 10 minutes each.
METHOD

Observational study:
• Observed medical laboratory scientists conducting blood culture analysis.
• Clarified observed events through informal interviews.
• Notes based around observational guide structured into:
  • Analysis of blood cultures.
  • Communications of test results.
• Observed data coded by themes through meaning condensation.

Examples of coding:
1. Document preliminary result in LIS.
2. Look up test history in LIS.
3. Scan barcode
RESULTS

Workflow during blood culture analysis.

1. Sample preparation
2. Microscopy
3. Secondary cultivation of bacteria
4. Analysis
RESULTS

Communication of blood culture analysis results:

1. Print report
2. Transfer report
3. Evaluate results
4. Transfer report
5. Submit report
6. Send report

LIS = Laboratory Information System
MLT = Medical Laboratory Technician
DCM = Department of Clinical Microbiology

Electronic patient chart

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SYSTEM REQUIREMENTS

• The ability to receive and send data to the laboratory information system.

• Ability to use barcodes to enter information into the system, e.g., the patient ID.

• Communication of test results between medical laboratory technicians and physicians.

• Access to test instructions platform through a web browser.
DISCUSSION

• Are the results generalizable?
  • Data saturation not yet achieved.

• System should be flexible enough to support the workflow of different clinical microbiology laboratories.

• The system must be able to both send and receive data from the laboratory information system.
DISCUSSION

• Potential for use of tablet built-in camera for barcode scanning.

• Browser support built-in by modern tablets, which will allow access to test instruction system.

• System requirements based on existing workflow.
DISCUSSION

• In conclusion:
  • Four essential system requirements identified.
  • Potential for improved patient care through workflow optimization, and faster notification of blood culture analysis results.
  • Foundation for further system development.
Thank you for your attention!

Any questions?

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