

It is Time to Reassess the Role of Blood Cultures in the Current Practice of Medicine

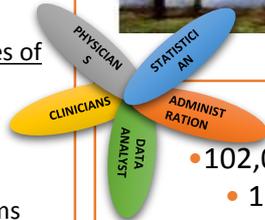
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Introduction



Today's physician must deal with multiple sources of data:

- Confronted by multiple bundles such as septic shock and sepsis bundles
- Rapid communication of PCR results in an environment of antibiotic stewardship programs
- Smartphone utilization and predictive analysis



6 Year Study

- 102,000 total cultures ordered
 - 17,000 cultures per year
 - 5% positive
- \$60 million in charges

Mortality over a 6-year period was unchanged regardless of the number of blood cultures ordered

Further Examples

Case-based analysis

- Cellulitis and gallbladder patients did not have a significant number of positive blood cultures compared to the number of tests ordered
- 1.8% of 214 acute cholecystitis patients had a positive result, zero mortalities, median age 83
- 0.6% of 114 cellulitis without abscess cases had a positive result, 2 mortalities
- 0% of 293 pure asthma or COPD had a positive result, zero mortalities

Historical Perspective

Internal medicine residents used traditional methods of data collection to analyze single organisms and mortality and realized:

- Data could have a larger impact in the efficient management of patients
- Multi-disciplinary teams should gather and evaluate detailed data
- Data could assist laboratory testing and decision making in clinical scenarios
- Need for the development of guidelines

We chose to study blood cultures because of the large number ordered

Methodology and Results

A group of physicians, data scientists, researchers, and clinicians came together to analyze traditional data, single organisms and ask questions about clinical diagnosis.

How are the tests ordered, who orders them and on what basis?

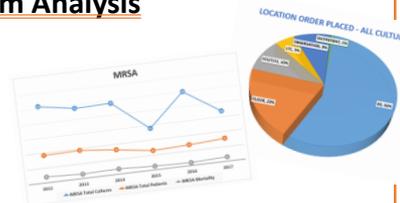
Preliminary Data

Tests ordered (traditional)

- Currently, two sets of blood cultures ordered 30 minutes apart at the discretion of the ordering provider
- Additional blood cultures ordered due to temperature elevation/leukocytosis/other

Single organism Analysis

- Mortality
- Site of order origin



Conclusions

- We do too many blood cultures at significant cost
- Appropriate guidelines can be developed utilizing integrated data and clinical scenarios that would identify patients who should have blood cultures as part of their evaluation
- All blood culture guidelines for local hospital systems should be reviewed and assessed for efficacy and efficiency by the appropriate personnel

Recommendations

- National organizations should consolidate and codify one set of clinically relevant and case-based guidelines for blood cultures from those which are available
- Specific analysis of integrated data, such as this study demonstrates for blood cultures, should also be used as a mechanism to evaluate the usefulness of other common tests, such as CBC, EKG, echocardiogram, chest x-ray, or CT scan