CAN AFB SMEAR BE UNLINKED FROM CULTURE?

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Background

- Timely laboratory testing can make a difference for individual care and public health

Paradigm

- Public health labs/programs are stewards of public resources
- Resources are not increasing
- Examine routines that incur cost but may not add value

Background

Web scan→…..Missouri Lab

*****Smear and culture are always performed together

How many states and hospitals have this policy?

Purpose

- Stimulate discussion on coupled smear/culture
- Explore scenarios that involve smear and culture request
- Raise questions as we consider new paths

Questions

1) When is culture needed?

- In what situations is culture routinely performed?
- What decisions are made with culture results?

2) Is coupling of smear and culture always warranted

- In which cases might the two be unlinked?

3) What pitfalls might be considered when uncoupling culture from smear?

How does culture inform decisions?

Clinical and public health **decision** points:

Diagnosis confirmed by culture

- triggers treatment
- initial DST informs treatment selection
- procedures/ test for competing diagnoses abandoned
- clearance for discharge/board airplane/release to sensitive setting
- initiate contact investigation (pulmonary disease site/culture positive)

→ **Treatment response**

- Detecting acquired drug resistance
- Documenting culture conversion
- Length of treatment decisions
- Detecting treatment failure
- Documenting cure

Why are smear and culture linked?

Why did this routine get started in first place?

- Clinicians ordered smears but not culture for many patients→ Additional specimens were needed for culture

Consequences: inefficiency and lost opportunity

- Required more specimen collection to perform culture when culture could have been done on specimen submitted for smear
- By time patient on treatment returned, culture negative
- For some patients, when specimen sent for smear only and result was negative, no opportunity for further specimen collection

When does it make sense for smear and culture to be uncoupled?

- TB diagnosis is well established
  - positive culture for MTB complex documented
  - patient on TB treatment
- Collection of specimens for smear only needed for documenting smear conversion

- **Other needs for culture satisfied**

When can smear and culture be uncoupled?

When culture result will not change clinical or public health decisions

Case1: Extensive disease

- Smear positive, in isolation for 2 months, extensive disease
- Team anxious to remove from isolation, ordering sputum smears daily
- Hospital and lab costs mounting
- Culture obtained at start of treatment and day 15 grew pan-susceptible M tb

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- Can you unlink smear from culture in this patient?
- What if positive smears represent only dead bugs?
- What if last smear grade was low?

Culture confirmed :
2 months on treatment

OPTIONS:

- Obtain smears at lower frequency
- Do not perform culture on all specimens sent for smear
- Perform culture on specimen at month 1 and month 2

What is preferred approach when assessing response to treatment, culture conversion needed for treatment length, and detecting acquired drug resistance?

Case 2: MDR TB

Patient has MDR TB, day 20 on treatment

Anxious to fly:

- Both culture and smear must be negative for international flight clearance

On weak regimen or SAT

- Specimens may be needed for repeat DST early in therapy

Case 3: Disease site

- Patient is suspected of having peritoneal TB, started on TB treatment, and 4 specimens are submitted from peritoneal fluid.
- Laboratory receives specimen 5 for sputum smear and culture. **Must a culture be done on this specimen?**

YES, if culture is positive then a contact investigation will be performed because patient will be infectious with pulm disease site. In addition, patient will need documentation of sputum conversion.

Case 4: Patient goes to surgery

- Patient has 3 sputum specimens submitted for smear and culture and starts TB treatment. He is smear negative X 3 with culture pending. He has mass like pulmonary infiltrate.

- He is scheduled for bronch or open lung biopsy. Two specimens are sent for stain and culture.

Should the laboratory perform further culture since he is already on treatment and has initial diagnostic specimens?

- YES: surgical specimen difficult to obtain and may make definative diagnosis

How to devise guidance or policy ?

- **If culture is not required for clinical or public health decisions, it should not be automatically performed**

- If culture-confirmation established and a specimen for culture obtained in past 30 days

- It is unlikely for cultures to add value if performed daily or weekly.

***will a strict rule against performing culture on specimen 6-8 in month 1 serve the patient, laboratory or public health?

Communication

Policy involves and affects:

- Patients
- Providers
- Hospital lab
- Public health lab
- Local and state public health departments
- Hospital administrators

Laws can support principles

California Title 17- Section 2505

- Whenever lab finds specimen with known or suspected TB who has positive AFB stain
- AND patient has not had a culture which identifies AFB within 30 days
- the clinical lab shall culture and identify the acid fast bacteria or refer a subculture to another lab.

Summary: What makes sense?

If specimens already submitted for culture and treatment started for TB suspect, the subsequent frequency of culture should be driven by key decisions

For a patient on treatment with confirmed *M tb.complex:*

- If daily smears are ordered to determine whether to remove from isolation or discharge from hospital
- Makes sense to uncouple cultures and/or perform smears with less frequency

Summary 2: Key considerations

Following TB diagnosis, specimens for culture in the first 2 months of treatment may be indicated for:

Examples:

- Identifying second site of disease or surgical specimen
- Clearance for flight for MDR TB
- Documenting culture conversion
- Reexamining DST for acquired drug resistance

Summary: conclusions and caveats

1. Smears and cultures do not always need to be coupled
2. When clinical and public health decisions will not be modified by culture, consider unlinking
3. Policy changes should be guided by examining multiple vantage points: individual, public health, economic, operational considerations
4. Evaluation of cost, benefits, unintended consequences of any policy are useful

Famous Last Words

“Know the rules
so you can break them effectively”

Dalai Lama