



All We Need is Three Colonies

Alla Ostash, BS

Mycobacteriology Supervisor

WA Public Health Laboratories

2017



Objectives

- ▶ Targeted screening by primary care physicians improves the timely diagnosis of TB disease.
- ▶ When dealing with a very fastidious strain, the advances in laboratory methods provide much needed answers for a successful treatment plan.



Patient History

- 39 yo female from Vietnam
- Immigrated to US in 2008
- TST negative in 2009 performed in US
- Traveled back to Vietnam for prolonged visits twice
- Patient resided in a household with 3 other adults, 2 teenagers, and 4 year old daughter
- Patient acquired new health insurance - physical exam



Targeted Screening Program

- ▶ 2006 WA State TB Program was performing evaluations of local Health Departments (HD)
- ▶ Pierce County HD decided to encourage Target Screening
- ▶ 3 Vietnamese Physicians enrolled
 - ▶ Patients were given TB questionnaire
 - ▶ If certain questions were answered positively, the TB screening was initiated
- ▶ 11 years later - the daughter of one of these providers still continues this practice



Physical Exam

- ▶ Patient is asymptomatic
- ▶ Targeted Screening question:
 - ▶ Have you traveled outside of US for more than one week and where?
 - ▶ Answer: Vietnam
- ▶ TST +, abnormal chest x-ray
- ▶ To rule out active TB, 3 sputum specimens were collected



Initial Lab Results

05/24/16

Specimens
collected

5/26/16

AFB Smear Negative
on all 3 specimens

NAAT TB Negative

x2

- All specimens were watery and of minimal volume
- Patient was placed on INH monotherapy on 5/31/17



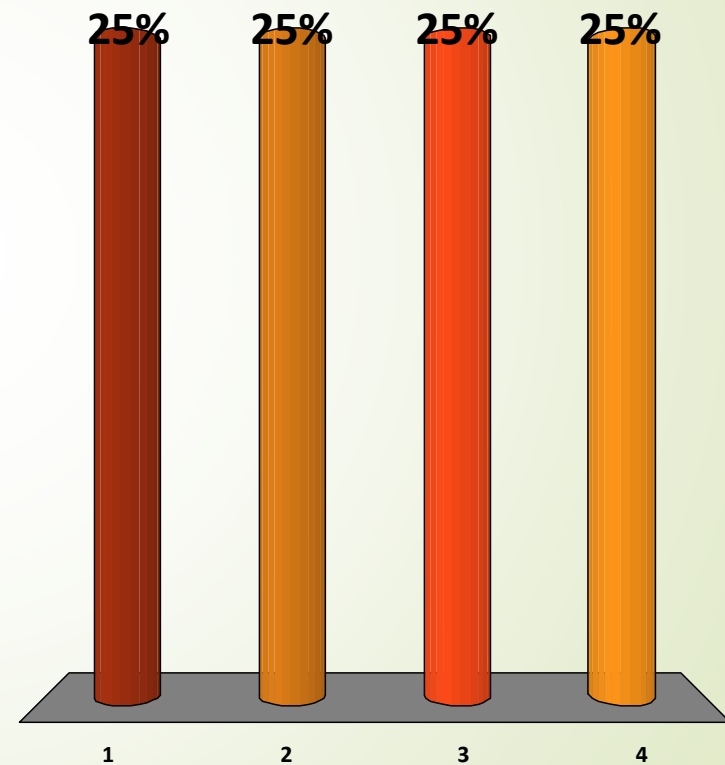
4 Weeks Later....

06/22/16

3 TB colonies
IRZE on 6/24/16

Could this be?

1. Cross-Contamination
2. Lab Error
3. True TB Case
4. All of the Above





Sensitivity Results

7 wks later

MGIT Sensitivities

Resistant to:

Streptomycin

Rifampin

Pyrazinamide

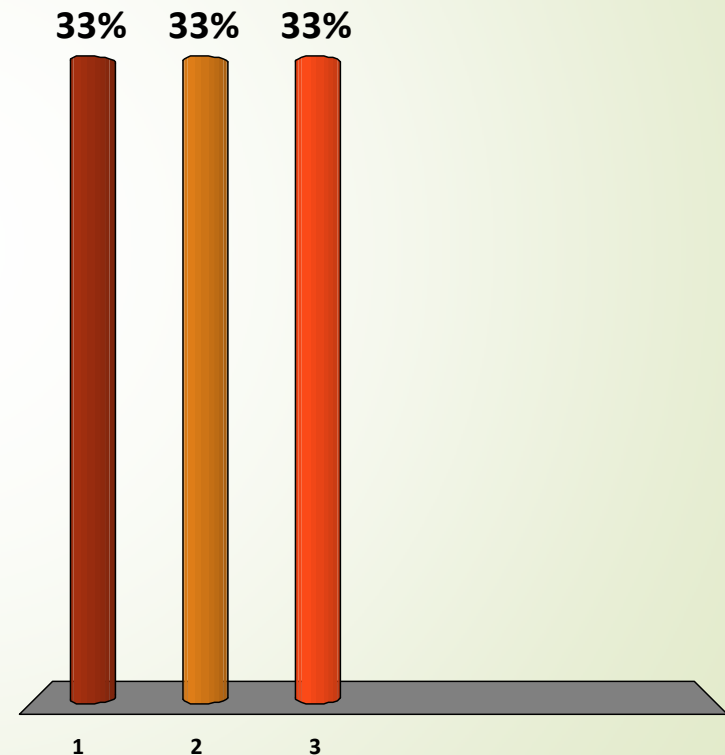
Repeated x2

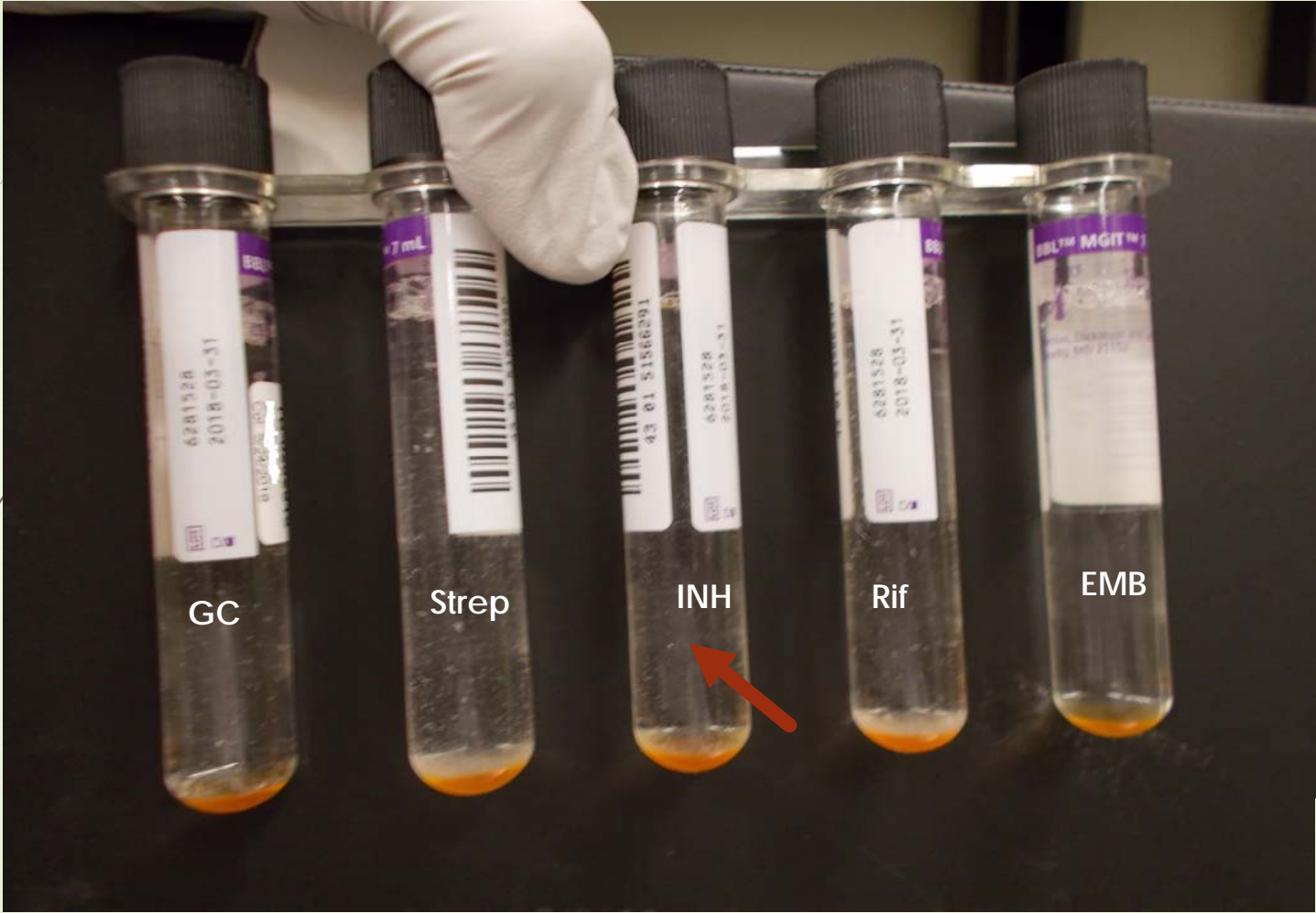
Growth in INH tube

Instrument
interpretation was
sensitive

How would your lab report such INH results?

1. Resistant – clearly there is growth in the tube
2. Indeterminate
3. Unable to perform, provide a verbal explanation to the clinician, and forward the specimen for molecular screening of drug resistance





GC

Strep

INH

Rif

EMB

Sequence No: 439550046615 TIP: 9;7 SOP: 06/29/2016 16:12 Removed Date: 07/11/2016

Access No: 0252919

Isolate No: 1

Tube Position	Growth Unit	Status	Concentration	Drug Name
C/M01	400 Mg	C		Growth Control
C/M02	400 Hg	R	1.00 ug/mL	Streptomycin
C/M03	?? 9 Mg	S	0.10 ug/mL	Isoniazid
C/M04	400 Hg	R	1.00 ug/mL	Rifampin
C/M05	0 -	S	5.00 ug/mL	Ethambutol

Sequence No: 439550028042 TIP: 8;21 SOP: 03/21/2017 15:50 Removed Date: 03/30/2017

Access No: 0252919

Isolate No: 1

Tube Position	Growth Unit	Status	Concentration	Drug Name
C/B06	400 Sq	C		Growth Control
C/B07	400 Mg	R	1.00 ug/mL	Streptomycin
C/B08	9 Sq	S	0.10 ug/mL	Isoniazid
C/B09	400 Mg	R	1.00 ug/mL	Rifampin
C/B10	0 Ng	S	5.00 ug/mL	Ethambutol



Summary of Sensitivities Results

Drugs	MDDR	MGIT	Agar Proportion*
Strep	N/A	Resistant	25 colonies
Isoniazid	inhA mutation C-15T	Growth in tube	6 colonies
Rifampin	rpoB mutation Ser531Leu	Resistant	25 colonies
Ethambutol	Neutral mutation	Sensitive	No Growth
PZA	pncA mutation Aps12Ala	Resistant	N/A
Ethionamide	N/A	N/A	25 colonies

*Agar proportion plates were not reported due to insufficient growth on controls



Current Regimen

- ▶ Patient is doing great
- ▶ Current regimen
 - ▶ Amikacin, Cycloserine, EMB, Levofloxacin, PAS



Conclusions

- ▶ Targeted screening detected the case at a very early stage
 - ▶ All of the close contacts tested negative
- ▶ Can not always trust the instrument interpretation for sensitivities
 - ▶ Visual checks for growth should be routine practice
- ▶ Advantages of using molecular screening for mutations
 - ▶ Confirmed an MDR case
 - ▶ Provide much needed answers for fastidious strains
 - ▶ The only answer we had for Isoniazid and Ethionamide resistance



WA State TB Lab staff



Peggy Cooley at Tacoma
Pierce County HD



THANK YOU!