

Ochrobactrum anthropi,
Klebsiella oxytoca, and
Stenotrophomonas maltophilia:
What do we do with these?!

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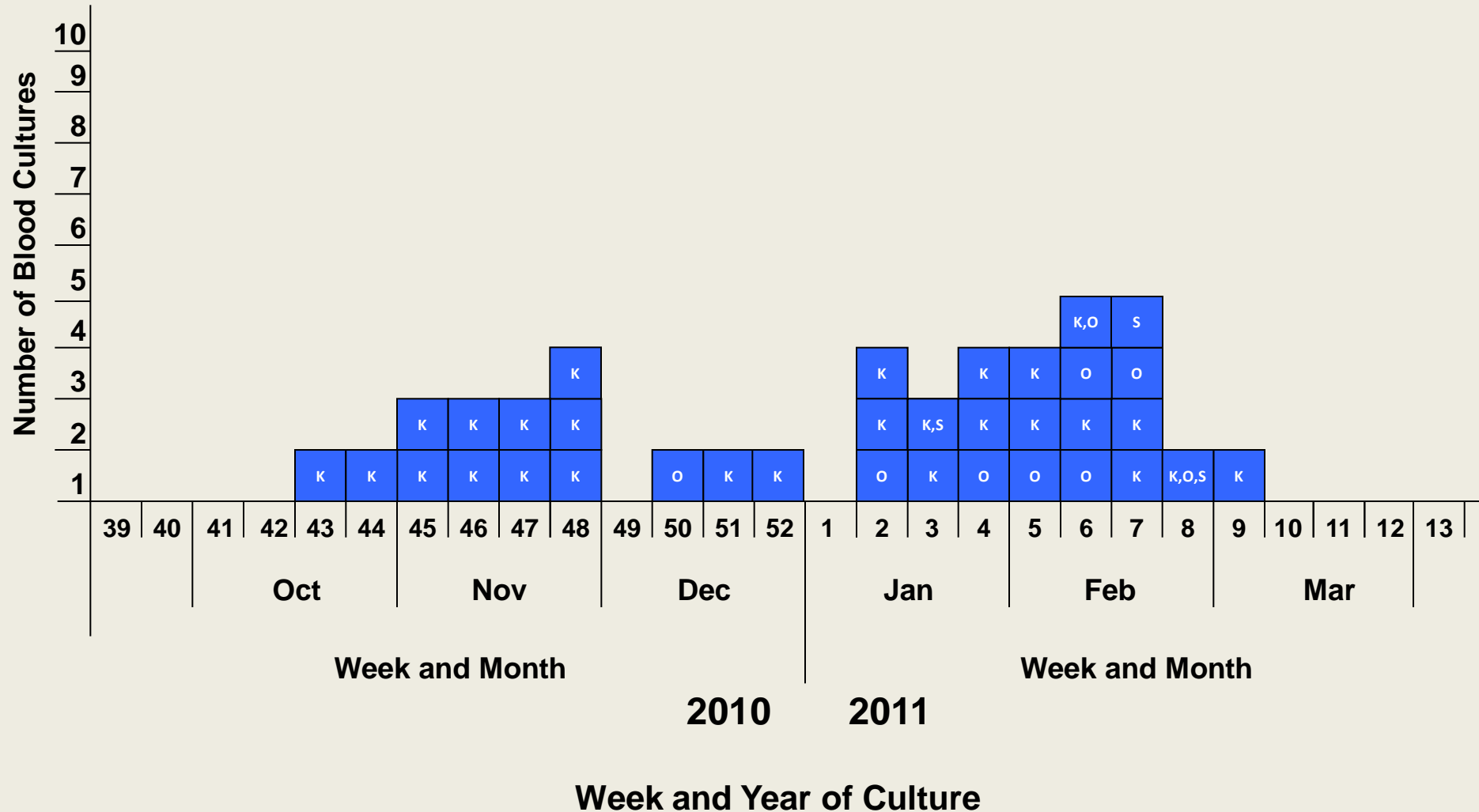


Background

February 2011

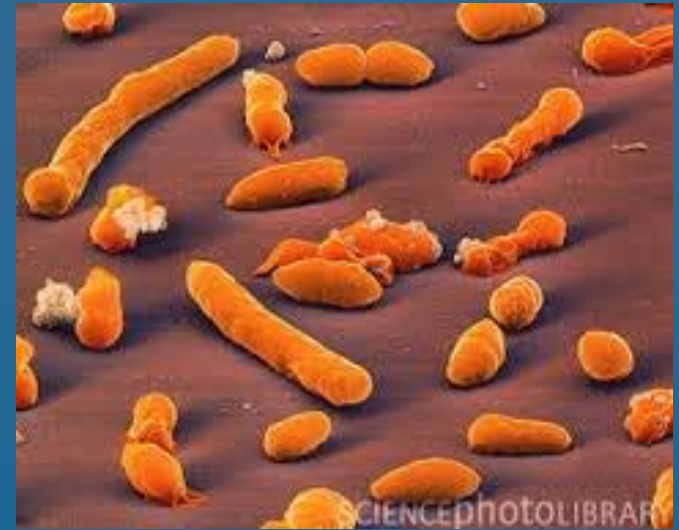
- An infection preventionist from a local hospital contacted Minnesota Department of Health (MDH) epidemiologists about a cluster of 4 patients with *Ochrobactrum anthropi* (OA) bacteremia
- All patients were from the same surgical floor
- MDH epidemiologists initiated an investigation and notified PFGE
- Additional bacterial species were identified from the original patients by the reporting hospital
 - *Klebsiella oxytoca* (KO) and *Stenotrophomonas maltophilia* (SM)

All Positive Blood Cultures (n=35) for *K. oxytoca* (KO), *O. anthropi* (OA), and/or *S. maltophilia* (SM) for Case-Patients

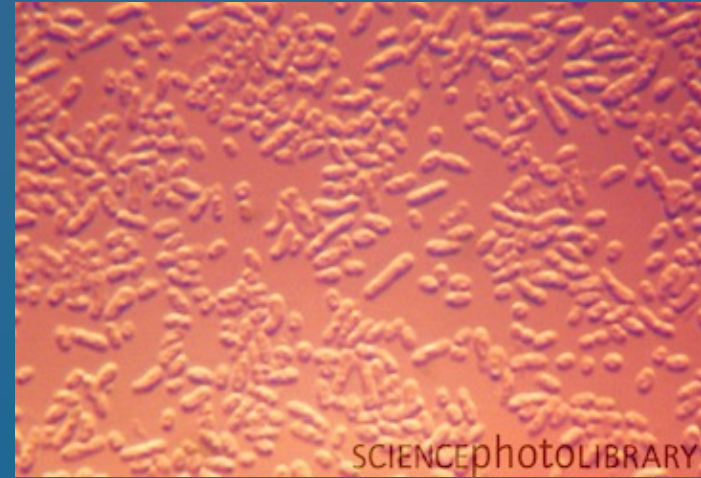


Klebsiella oxytoca

- Aerobic Gram negative rod
- Formerly *Aerobacter sp.*
- Ubiquitous in nature
- *Klebsiella spp.* Responsible for 8% of nosocomial infections in the US and Europe
- Tends to colonize mucosal membranes, but can colonize anywhere

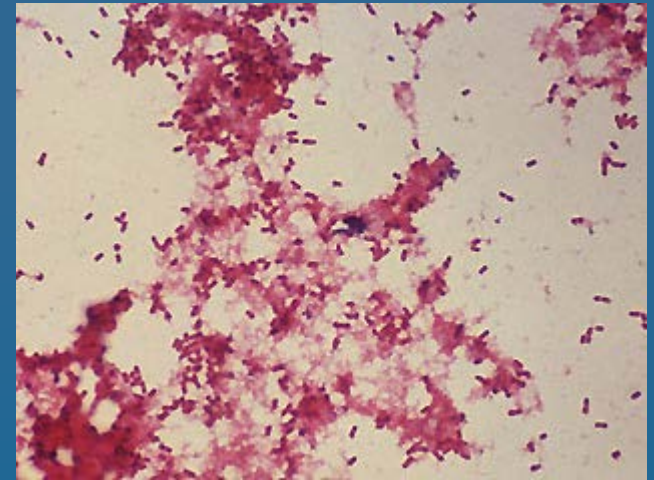


Ochrobactrum anthropi



- Aerobic Gram negative rod
- Formerly *Achromobacter sp.*
- Common soil organism
- Becoming increasingly common as an opportunistic and nosocomial infection
- Can be found in indwelling medical devices like catheters and drainage tubes

Stenotrophomonas maltophilia



- Aerobic Gram negative rod
- Formerly *Pseudomonas sp.* and *Xanthomonas sp.*
- Commonly found in aqueous environments
- Increasingly common as an opportunistic and nosocomial infection
- Multi-drug resistant
- Can colonize breathing tubes, urinary catheters, and the respiratory tract

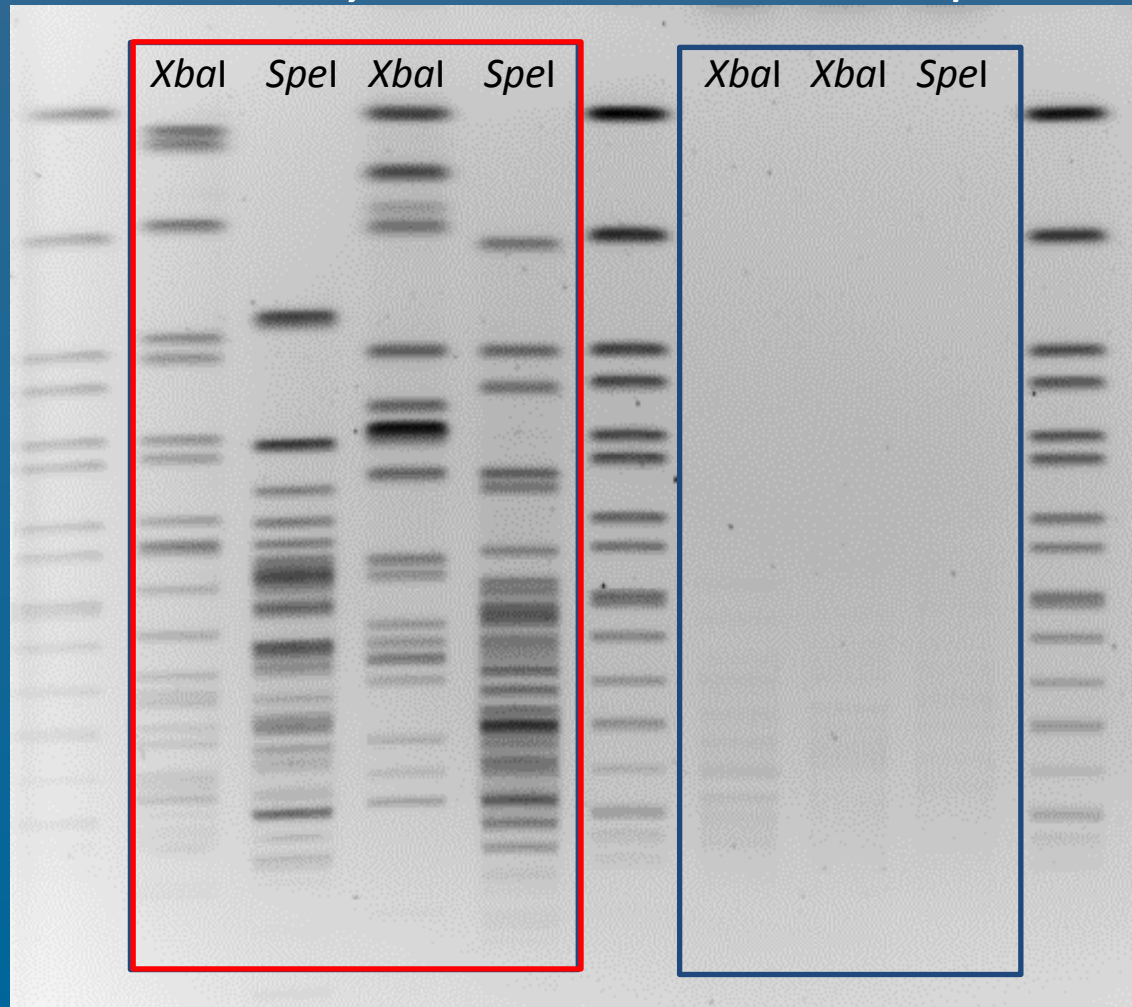
PFGE testing

- MDH Microbiology lab received the first *OA* and *KO* isolates from the hospital in late February
 - *SM* isolates received in early March
- Lab personnel did a literature search for PFGE protocols for each organism
 - PulseNet summary of PFGE for other organisms had protocols for *KO* and *SM*
 - Found several journal articles with PFGE protocols for *OA*

Initial trial – *KO* and *OA*

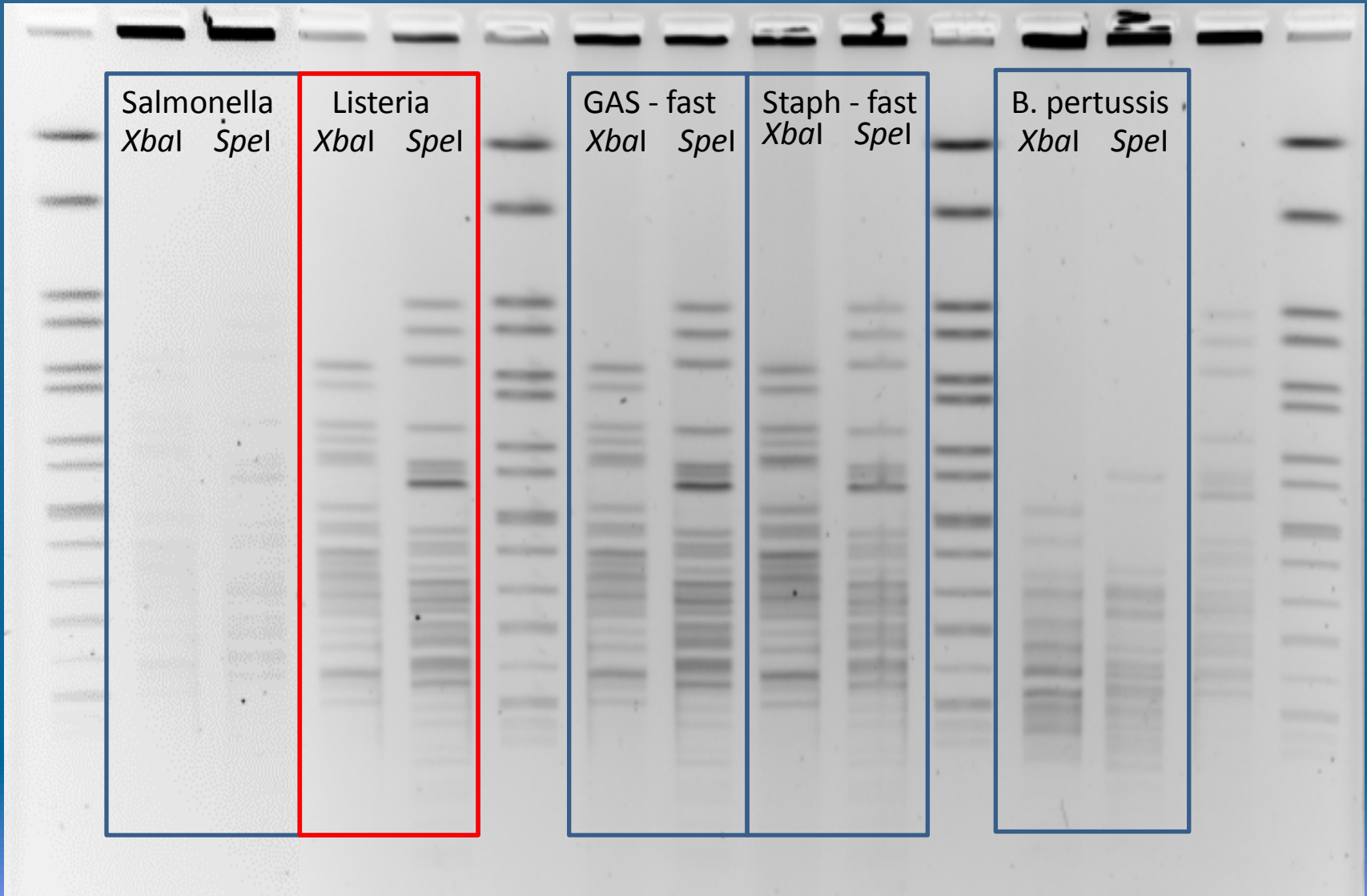
K. oxytoca

O. anthropi



KO and *OA* samples were initially run with the *Salmonella* PulseNet protocol

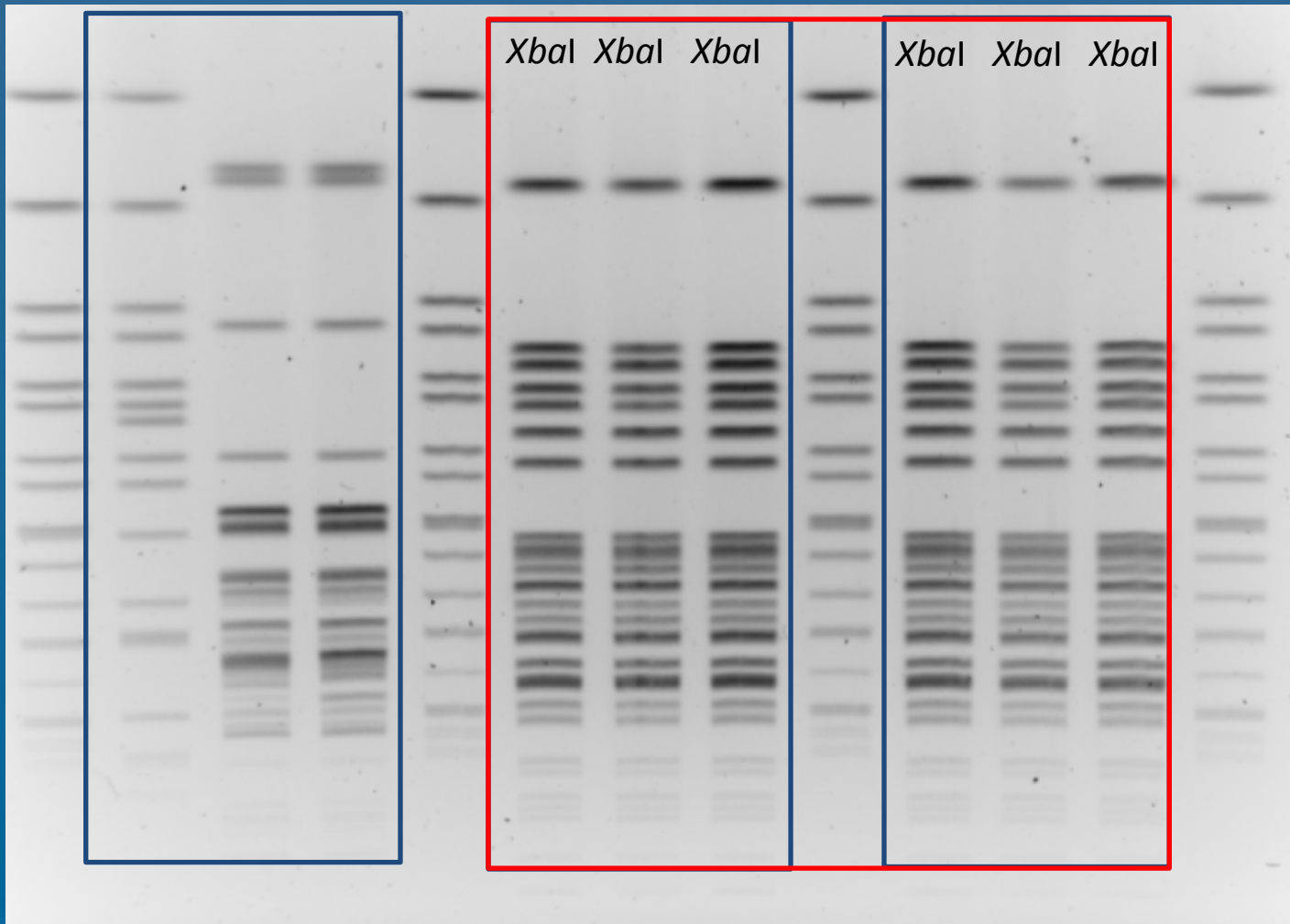
Ochrobactrum anthropi trials



Initial trial - *SM*

Routine *Salmonella*

S. maltophilia



SM samples were initially run with the *Salmonella* PulseNet protocol

Final protocols

Organism	Agarose plug casting	Enzymes (1 st & 2 nd)	Initial and final switch times
<i>K. oxytoca</i>	PN E. coli protocol *	Xbal SpeI	2.2 s and 64.0 s (PN Salmonella)
<i>O. anthropi</i>	PN Listeria protocol	SpeI Xbal	2.2 s and 64.0 s (PN Salmonella)
<i>S. maltophilia</i>	PN E. coli protocol	Xbal	2.2 s and 64.0 s (PN Salmonella)

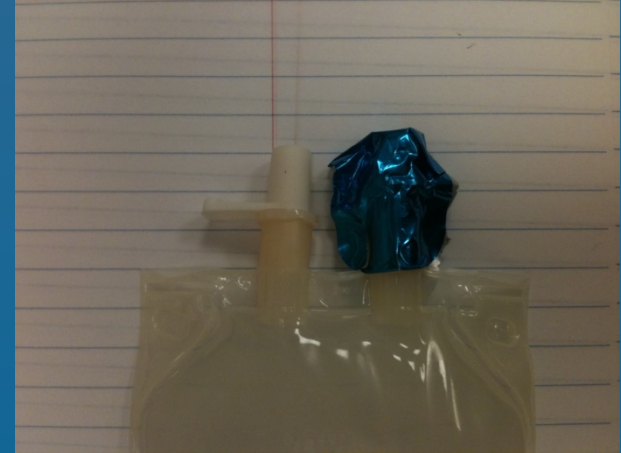
* No proteinase K was added to plug.

- Run with H9812 Standard
- Digested for up to 2 hours

Epidemiology results

Many areas of the hospital were investigated:

- Microbiology lab
- Phlebotomy practices
- Environmental contamination
- Surgical and anesthetic practices
- Pharmaceutical contamination
(manufacturer, pharmacy, or staff)

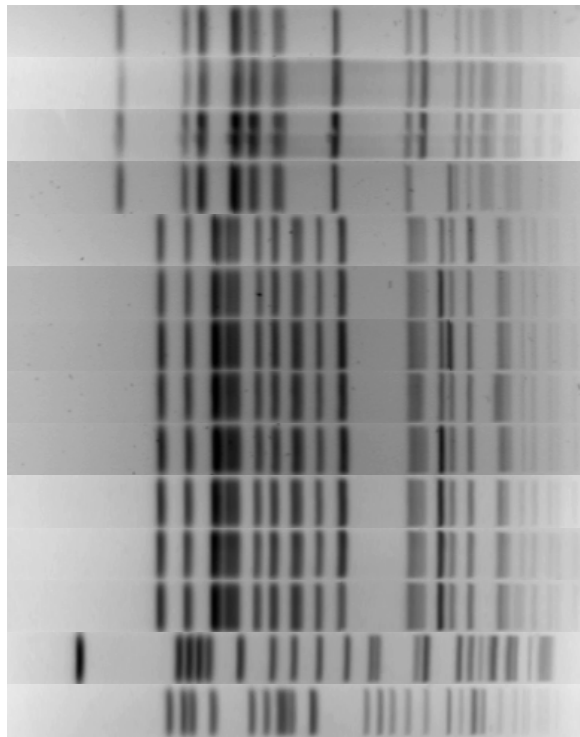
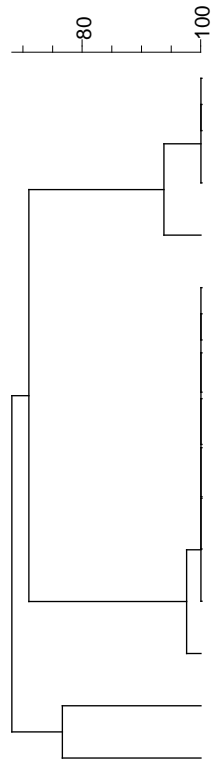


Klebsiella oxytoca PFGE results

Dice (Tol 1.5%-1.5%) (H>0.0% S>0.0%) [0.0%-100.0%]

PFGE-XbaI

PFGE-XbaI



ID

TypeDetails

MN XbaI PFGE

7

Blood

KOXY2*

21

FDA, hydromorphone bag C (#2BC)

KOXY2*

26

FDA, hydromorphone bag D (#2CA)

KOXY2

5

Blood

KOXY3*

18

Blood

KOXY1

21

Blood

KOXY1*

2

Blood

KOXY1

6

Blood

KOXY1

23

Blood

KOXY1

21

SCH, hydromorphone bag A

KOXY1

21

FDA, hydromorphone bag C (#2BB)

KOXY1

26

SCH, hydromorphone bag B

KOXY1

N/A

SPCU bathroom drain


KOXY9*

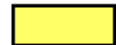
N/A

Surgery 1A drain

KOXY8*

PFGE Pattern	KOXY1	KOXY2	KOXY3	KOXY8	KOXY9
KOXY1	--				
KOXY2	>10	--			
KOXY3	>10	2	--		
KOXY8	>10	>10	>10	--	
KOXY9	>10	>10	>10	>10	--

 Indicates unrelated

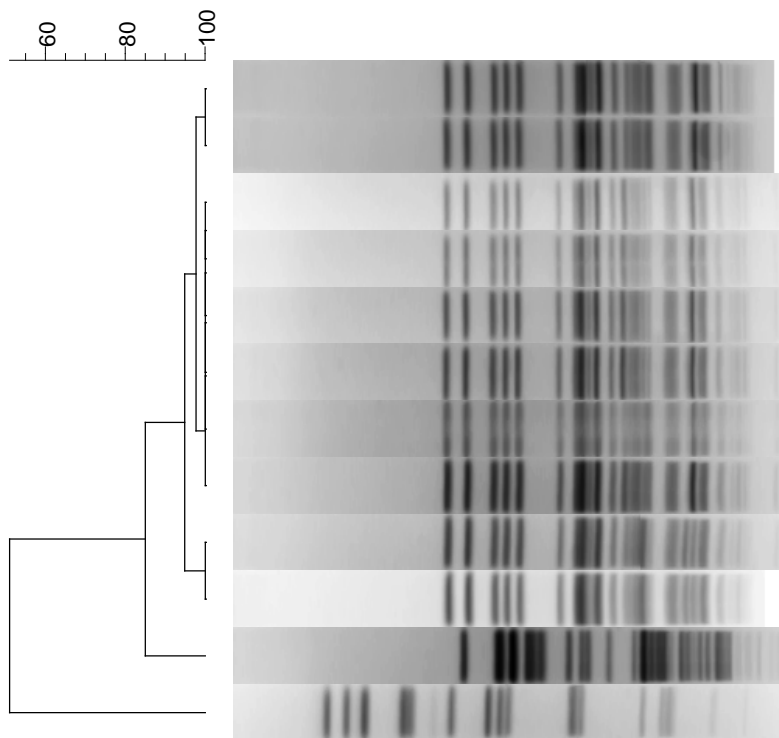
 Indicates closely related

Ochrobactrum anthropi PFGE results

Dice (Opt:1.50%) (Tol 1.5%-1.5%) (H>0.0% S>0.0%) [0.0%-100.0%]

PFGE-Spel

PFGE-Spel



ID	SourceSite	MN Spe1 PFGE
N/A	FDA, saline bottle (#1A)	OANT9*
N/A	FDA, saline bottle (#1B)	OANT9
7	Blood	OANT4
18	Blood	OANT4
5	Blood	OANT4*
3	Blood	OANT4
21	Blood	OANT4
20	Blood	OANT4
14	Blood	OANT6
14	Blood	OANT6*
N/A	Quality control organism	OANT5*
N/A	Cornea	OANT7*

PFGE Pattern	OANT4	OANT5	OANT6	OANT9
OANT4	--			
OANT5	>10	--		
OANT6	2	>10	--	
OANT9	3	>10	5	--

- Indicates unrelated
- Indicates closely related
- Indicates possibly related

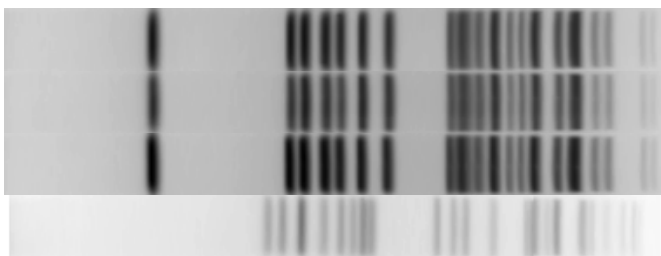
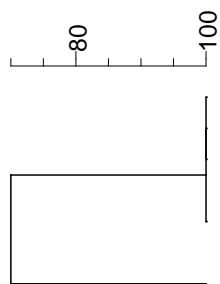
Stenotrophomonas maltophilia

PFGE results

Dice (Tol 1.5%-1.5%) (H>0.0% S>0.0%) [0.0%-100.0%]

PFGE-XbaI

PFGE-XbaI

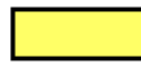


ID	TypeDetails	MN XbaI PFGE
21	SCH, hydromorphone bag A	SMALT1
26	SCH, hydromorphone bag B	SMALT1*
15	Blood	SMALT1
N/A	Surgery 1A drain	SMALT6*

PFGE Pattern	SMALT1	SMALT6
SMALT1	--	
SMALT6	>10	--



Indicates unrelated



Indicates closely related



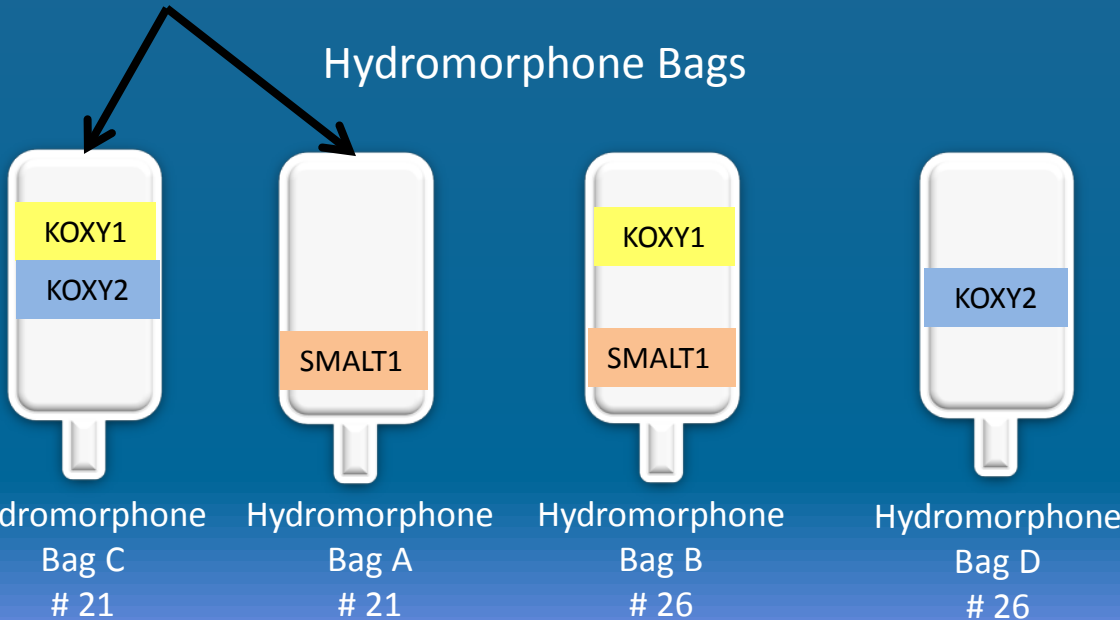
Indicates possibly related

PFGE Results from Patient Isolates, Narcotic bags, and Saline Bottle

Bacteremias



Hydromorphone Bags



Acknowledgements

MDH lab

Selina Jawahir, Victoria Lappi, Jackie Mahon,
Dave Boxrud

MDH epidemiology

Aaron DeVries, Jane Harper, Lindsey Lesher,
Melissa Schaefer, Richard Danila, Ruth Lynfield