PROFICIENCY TESTING SERVICE
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PARTICIPANT STATISTICS BACTERIOLOGY THIRD QUADRIMESTER 2016

Specimen 1 - Urine - 77 year old Female, Flank pain, fever

Organisms		Extent 1	2	3	4	5
879	*Staphylococcus saprophyticus*		1	76	33	6
985	Organism is gram-positive	2	1	13	1	
874	*Staphylococcus* sp.; coagulase-negative; NOS			12	2	2
873	*Staphylococcus* sp.; NOS			8		
994	Growth of gram-positive organisms	4		1		
943	Aerobe found; but referred for ID	2			1	
877	*Staphylococcus aureus*		1	1		
878	*Staphylococcus epidermidis*			1		
989	*Klebsiella*; *Staphylococcus* or *Streptococcus*			1		
811	*Klebsiella* sp.; NOS				1	
777	*Corynebacterium* sp.; NOS				1	
875	*Staphylococcus* sp.; coagulase-positive; NOS			1		
791	*Enterococcus* sp.; NOS			1		
993	Growth of gram-negative organisms			1		
	TOTAL PARTICIPANTS	8	3	116	39	8

Flagging appears for failure to report 873, 874, 879, 922, 943, 985, 989 or 994.
In addition to the required organism, participants in all extents may report 777.

This urine held *Staphylococcus saprophyticus* and diphtheroids, *Corynebacterium* sp. This pathogenic *S. saprophyticus* is more frequently seen than recognized. Occurs most commonly in the 20-30 year old age group women and is missed as "*S. epidermidis*, skin contaminant." It is not. It is rarely pigmented and coagulase-negative, unlike *S. aureus* or *S. epidermidis*. It produced a large colony which is characteristic.

The diphtheroid is a true skin contaminant.

Specimen 2 - Throat - 19 year old Male, fever, severe sore throat

Organisms		Extent 1	2	3	4	5
923	Pos for Grp A strep screen by culture	2	9	53	1	
887	*Streptococcus pyogenes*		1	17	14	4
886	*Streptococcus* sp.; beta-hemolytic Grp A (*S. pyogenes*)			24	7	3
985	Organism is gram-positive	4	2	11		
874	*Staphylococcus* sp.; coagulase-negative; NOS			6	3	
921	Pos for beta-hemolytic strep screen			5		
943	Aerobe found; but referred for ID	2				
926	Pos for Grp B strep screen by culture		1	1		
976	Pos for strep Group A antigen			2		
878	*Staphylococcus epidermidis*			2		
889	*Streptococcus* sp.; beta-hemolytic; not Group A					1
898	*Streptococcus agalactiae*			1		
718	Normal flora found, not normally reported				1	
873	*Staphylococcus* sp.; NOS			1		
982	Pos for *S. pneumoniae* antigen			1		
	TOTAL PARTICIPANTS	8	13	124	26	8

Flagging appears for failure to report 886, 887, 921, 923, 943, 976 or 985.
In addition to the required organism, participants in all extents may report 873, 874 and 878.

This swab produced beta *Streptococcus pyogenes* Gp. A and *Staphylococcus epidermidis*. Streptococci are spread person-to-person by shared food and utensils, and are airborne. As soon as school starts there is a mini-epidemic of sore throats at school and at home, if younger siblings are there. Gp. A, beta streptococci are the most common and feared; quick diagnosis is via direct antigen tests specific for Gp. A, with accuracy in the 95-98% range. It still requires a BAP back-up for swabs with <30 organisms. Gp. A strep are serious pathogens that must be treated promptly. This is a common PANIC VALUE specimen.

The *S. epidermidis* is what its name implies, a skin contaminant.

Specimen 3 - Ear - 12 year old Male, Earache, discharge

Organisms		Extent 1	2	3	4	5
841	*Pseudomonas aeruginosa*			66	32	8
838	*Pseudomonas* sp.; NOS			24		
983	Organism is gram-negative	6		12	1	
842	*Pseudomonas fluorescens* group			2	1	1
943	Aerobe found; but referred for ID	2				
847	*Salmonella* sp.; not *typhi*				1	
	TOTAL PARTICIPANTS	8		104	35	9

Flagging appears for failure to report 838, 841, 842, 943 or 983.
In addition to the required organism, participants in all extents may report [no additional codes]

This ear exudate produced *Pseudomonas aeruginosa*. Varying degrees of pain accompany swimmer's ear, which results from the contaminated water getting between the ear drum and the ear wax. The closer to shore, the higher the bacterial count of the water. Pseudomonas is a "water-bug" and the coliform count that closes beaches does not react to high pseudomonas counts, ergo, swimmer's ear outbreaks among the smallest of the waders in shallow waters.

P. aeruginosa is the most common nonfermenting gram negative rod isolated in the lab. It is DNase and oxidase positive. Its primary and conclusive ID is production of green pigment. It also went by the name *P. polycolor*, to see why, leave your isolate on its AST plate at room temperature for 2-3 days and see the variety of colors you can get. In the laboratory, *P. aeruginosa* may only fluorescine but can be distinguished from *P. fluorescens* and *P. putida* with an acetamide slant, DNase plate or growth at 42° C. Topical hydrogen peroxide or bromines usually work-that's all they used before antibiotics.

Specimen 4 - Stool - 25 year old Male, watery diarrhea

Organisms		Extent 1	2	3	4	5
871	*Shigella sonnei* (Serotype D)			25	16	8
866	*Shigella* sp.; NOS		3	34	3	1
983	Organism is gram-negative	7	2	4		
943	Aerobe found; but referred for ID	4		2		
929	Stool cult not performed; would refer			1		1
937	Neg for *Sal*; *Shig* & *Campy* (referred for *Vib* & *Yers* cult)			1		
941	Neg for *Sal* & *Shig* (referred for *Vib*; *Yers* & *Campy* cult)			1		
	TOTAL PARTICIPANTS	11	5	68	19	10

Flagging appears for failure to report 866, 871, 929, 943 or 983.
In addition to the required organism, participants in all extents may report.[no additional codes]

This diarrheic specimen contained *Shigella sonnei*. Diarrhea is the most common syndrome globally with over 100 million cases at any given time. While *E. coli* may be among "the usual suspects" here, *Shigella sonnei* is a known perpetrator. Shigellae are biochemical unachievers, which grow slowly and most inconspicuously on older enteric media, and not at all on bismuth sulfite and SS agars. XLD and HE agars were designed to permit better growth of shigellae and resulted in a large increase in *S. sonnei* detections in particular. The red colonies on XLD have an 80% probability of being shigellae but HE grows many more non-H2S organisms, so false-positives are more common.

The real *S. sonnei* is negative for all the usual tests-indol, urea, ONPG/lactose, DNase and oxidase. It will be ornithine positive but nonmotile and type with *Shigella* Grp. D antisera. This older patient may have gotten it from a salad bar or undercooked "fast foods". It will respond to antibiotics so do antimicrobial susceptibility tests (AST) and report.

Specimen 5 - Blood - 35 year old Female, HIV positive, ICU patient

Organisms		Extent 1	2	3	4	5
865	*Serratia marcescens*		1	49	30	9
877	*Staphylococcus aureus*			34	20	8
983	Organism is gram-negative	6		5	1	
862	*Serratia* sp.; NOS			8		
943	Aerobe found; but referred for ID	4	1	2		
985	Organism is gram-positive	2		1		
875	*Staphylococcus* sp.; coagulase-positive; NOS			2		
873	*Staphylococcus* sp.; NOS			2		
874	*Staphylococcus* sp.; coagulase-negative; NOS			1	1	
881	*Streptococcus* sp.; NOS			1		
846	*Salmonella* sp.; NOS			1		
945	No anaerobes isolated				1	
863	*Serratia liquefaciens*			1		
787	*Enterobacter* sp.; NOS			1		
788	*Enterobacter aerogenes*			1		
	TOTAL PARTICIPANTS	12	2	109	53	17

Flagging appears for failure to report 862, 865, 943, 945 or 983 along with 873, 875, 877, 881, 943, 945 or 985.
In addition to the required organism, participants in all extents may report [no additional codes].

This blood culture showed *Serratia marcescens* and *Staphylococcus aureus*. Positive blood cultures yield pathogens until proven otherwise. Rare pathogens like *S. marcescens* are most apt to be found in the medically immunosuppressed, as it is not very virulent. The characteristic red pigment found in type culture, is rarely seen in the hospital lab. However on EMB, experienced techs recognize it easily by its weakly coral-colored center. It is positive on DNase agar, motility and ornithine in MOI agar tubes.

Staphylococcus aureus is a major cause of bacteremia. It is associated with poor outcomes, but has become more common as invasive procedures have proliferated. Implantable devices, in particular, seem to be a common vehicle for pathogen entry. In the immunocompromised, trivial or routine avenues become open doors as the body has lost its ability to fight off nascent infections. Any positive blood is a panic value and any isolated organism should be reported.