American Association of Bioanalysts

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Q2 2018 Bacteriology

Specimen 1 - Urine - 78 year old Female, Nursing home, incontinent

Organisms	Extent	1	2	3	4	5	Total
799 - Escherichia coli		1	4	68	24	5	102
983 - Organism is gram-negative		2	0	14	0	0	16
987 - E.coli; Citrobacter or Enterobacter		1	0	4	2	0	7
993 - Growth of gram-negative organisms		2	0	3	0	0	5
798 - Escherichia sp.; NOS		0	0	3	0	0	3
942 - Primary culture only, refer for ID		0	1	0	0	0	1
943 - Aerobe found; but referred for ID		1	0	0	0	0	1
			TOTAL PARTICIPANTS				136

Flagging appears for failure to report 798, 799, 942, 943, 983, 987 or 993.
In addition to the required organism, participants in all extents may report (No additional codes).
This sample contained *Escherichia coli.*

Strong urges to urinate, and sometimes urinary incontinence can be symptoms of a urinary tract infection (UTI), as seen in this case. Quantitative urine culture of a clean-catch urine specimen obtained from this patient grew $>10^5$ CFU/ml *Escherichia coli*. *E. coli* is an organism that, in contrast to the vast majority of organisms encountered in the clinical bacteriology laboratory, can be tested and reported with minimal work-up. That is, oxidase-negative and gram-negative organisms that are spot indole-positive and -hemolytic on blood agar can be identified as *E. coli*. Alternatively, indole-positive colonies that are nonhemolytic and lactose positive (e.g., MAC, EMB) can be identified as E. coli with a negative Pyrrolidonyl Arylamidase (PYR) test.

Specimen 2 - Throat - 20 year old Male, Fever, cough

Organisms	Extent	1	2	3	4	5	Total
841 - Pseudomonas aeruginosa		2	4	26	19	6	57
922 - Neg for Grp A strep screen by culture		1	8	40	3	0	52
983 - Organism is gram-negative		4	2	7	0	0	13
919 - Neg for beta-hemolytic strep screen		0	3	5	1	0	9
838 - Pseudomonas sp.; NOS		0	0	9	0	0	9
927 - Neg for strep; not screened for GC		0	0	3	0	0	3
842 - Pseudomonas fluorescens group		0	0	3	0	0	3
943 - Aerobe found; but referred for ID		0	0	2	0	0	2
948 - No pathogens isolated		0	0	2	0	0	2
949 - No aerobic growth		0	0	1	0	0	1
925 - Neg for Grp B strep screen by culture		0	0	1	0	0	1
975 - Neg for strep Group A antigen		0	1	0	0	0	1
					TOTAL PARTICIPANTS		153

Flagging appears for failure to report 838, 841, 842, 919, 922, 925, 927, 943, 975 or 983.
In addition to the required organism, participants in all extents may report (No additional codes).
This sample contained *Pseudomonas aeruginosa* and *Neisseria spp.*

Abundant (i.e., third and fourth quadrant growth) *Pseudomonas aeruginosa* and few *Neisseria* spp. colonies were isolated from this patient's throat culture obtained upon hospital admission. Specimens obtained from the upper respiratory tract in general (e.g., throat, nasopharyngeal swabs, nasal discharges), while easily obtained, are typically contaminated with resident microbiota that are present in both the disease and carrier states. While both organisms recovered are not typically associated with acute pharyngitis and should not be reported from such cultures, abundant growth of *P. aeruginosa* from the initial throat culture correlated with subsequent pure growth of this organism observed from a lower respiratory specimen that confirmed this patient's hospital-acquired pneumonia. *P. aeruginosa* is an opportunistic pathogen most often associated with nosocomial pneumonia. Colonies on blood agar plates (BAP) are -hemolytic, but can be distinguished from pathogenic -hemolytic streptococci by their dark color on BAP (from green pigment produced) and Gram stain reaction/morphology.

Specimen 3 - Vaginal - 32 year old Female, Cramps and vaginal bleeding

Organisms	Extent	1	2	3	4	5	Total
877 - Staphylococcus aureus		1	3	52	23	6	85
985 - Organism is gram-positive		4	0	12	0	0	16
874 - Staphylococcus sp.; coagulase-negative; NOS		0	0	12	0	0	12
913 - Neg for N. gonorrhoeae by culture		0	3	7	2	0	12
925 - Neg for Grp B strep screen by culture		0	4	3	1	0	8
878 - Staphylococcus epidermidis		0	0	2	3	1	6
875 - Staphylococcus sp.; coagulase-positive; NOS		0	1	5	0	0	6
873 - Staphylococcus sp.; NOS		0	0	2	0	0	2
943 - Aerobe found; but referred for ID		2	0	0	0	0	2
718 - Normal flora found, not normally reported		0	0	0	1	0	1
871 - Shigella sonnei (Serotype D)		0	0	1	0	0	1
917 - No growth on Thayer Martin		1	0	0	0	0	1
	TOTAL PARTICIPANTS						152

Flagging appears for failure to report 873, 875, 877, 913, 917, 925, 943 or 985.
In addition to the required organism, participants in all extents may report 874, and 878.
This sample contained *Staphylococcus aureus* and *Staphylococcus epidermidis.*

The case patient was suffering from inflammation of the endometrial lining of the uterus which manifested, clinically, with lower abdominal cramping (a cardinal feature of endometritis) along with abnormal bleeding from the vagina due to *Staphylococcus aureus*. The laboratory diagnosis was made through culture of a transvaginal aspirate which grew 4+ pure *Staphylococcus aureus*. The diagnosis of endometritis is primarily done on clinical grounds based on the signs and symptoms of the disease. However, there are many laboratory investigations (e.g., CBC, ESR, blood/endocervical culture, wet mount of vaginal discharge) that can assist in the confirmation of the diagnosis and also as a prognostic tool for judging the response to treatment. Mild cases of endometritis is managed by starting oral antibiotics as soon as it is diagnosed, but may require hospitalization with administration of parenteral antibiotics, depending on the severity of the disease process. Antibiotic therapy is required to be continued until the patient becomes afebrile for more than 24 hours.

Specimen 4 - Stool - 38 year old Male, Cramps, diarrhea

Organisms	Extent	1	2	3	4	5	Total
866 - Shigella sp.; NOS		2	4	48	4	4	62
799 - Escherichia coli		0	3	14	3	1	21
983 - Organism is gram-negative		9	0	7	0	0	16
943 - Aerobe found; but referred for ID		4	0	2	0	0	6
869 - Shigella flexneri (Serotype B)		0	0	1	4	1	6
846 - Salmonella sp.; NOS		0	0	1	0	0	1
931 - Neg for Sal; Shig; Vib; Yers & Campy		0	0	0	1	0	1

930 - Normal Enteric flora no pathogens isolated	0	1	0	0	0	1
862 - Serratia sp.; NOS	0	0	1	0	0	1
867 - Shigella dysenteriae (Serotype A)	0	0	1	0	0	1
			TOTAL PARTICIPANTS			118

Flagging appears for failure to report 866, 869, 943 or 983.
In addition to the required organism, participants in all extents may report 799.
This sample contained *Shigella flexneri* and *Escherichia coli.*

This patient's clinical presentation was a 2-day history of fever, abdominal cramps and 7-8 diarrheal bowel movements per day, tinged with blood and mucous, and therefore, had a clinical course is consistent with bacterial dysentery. The major agents of bloody diarrhea are (in order of frequency in the industrialized world): 1) *Shigella*; 2) *Campylobacter*; 3) *Salmonella*; and 4) Shiga toxin-producing *Escherichia coli* (STEC). The pertinent laboratory work-up for this patient confirmed bloody diarrhea with the stool guaiac test and stool culture which grew *Shigella flexneri* on MAC agar, confirmed by commercial identification system. *Shigella* is a nonmotile, non-lactose-fermenting gram-negative organism that does not produce H_2S. *Campylobacter* does not grow on MAC, *Salmonella* produces H_2S and is motile, and STEC is a lactose fermenter and generally motile. The patient was treated with oral rehydration therapy with symptom resolution within 3 days.

Specimen 5 - Blood - 46 year old Female, Abdominal abscess, fever

Organisms	**Extent**	**1**	**2**	**3**	**4**	**5**	**Total**
814 - Klebsiella pneumoniae		1	5	35	17	6	64
807 - Haemophilus influenzae		1	0	10	12	6	29
805 - Haemophilus sp.; NOS		0	3	13	1	1	18
943 - Aerobe found; but referred for ID		4	1	8	2	0	15
983 - Organism is gram-negative		5	0	8	1	0	14
811 - Klebsiella sp.; NOS		0	0	8	0	0	8
813 - Klebsiella oxytoca		0	0	2	2	1	5
809 - Haemophilus influenzae; type b		0	1	0	0	0	1
826 - Neisseria gonorrhoeae		0	0	1	0	0	1
789 - Enterobacter cloacae		0	0	1	0	0	1
945 - No anaerobes isolated		0	0	0	1	0	1
877 - Staphylococcus aureus		0	0	1	0	0	1
878 - Staphylococcus epidermidis		0	0	1	0	0	1
963 - Neg for N. meningitidis Grps A/Y		0	0	1	0	0	1
				TOTAL PARTICIPANTS			160

Flagging appears for failure to report 811, 814, 943, 945, 963 or 983 along with 805, 807, 809, 943, 945, 963 or 983.
In addition to the required organism, participants in all extents may report (No additional codes).
This sample contained *Haemophilus influenza* and *Klebsiella pneumoniae.*

The previously healthy patient in this case presented with a 3-day history of right upper quadrant abdominal pain, fever and chills. Both sets (4-out-of-4 bottles) of the case patient's blood cultures drawn in the Emergency Department became positive (within 24 hours after admission) with *Klebsiella pneumonia* and *Haemophilus influenza*. A follow-up CT of the abdomen revealed a large, complex hepatic mass with areas of consolidated infiltrate. This clinical presentation is consistent with pyogenic liver abscess with a polymicrobial bloodstream infection. *Klebsiella pneumoniae* is a gram-negative organism that can cause PLA in the absence of hepatobiliary disease, and where diabetics are at increased risk. Some patients with *Klebsiella* liver abscess can develop metastatic infections (i.e., as seemingly observed in this case) including septic pulmonary emboli, for example, which may have been the mechanism by which the respiratory tract commensal, *H. influenza*, was able to seed the patient's bloodstream. As with any abscess, prompt drainage with or without drain placement should be done early in the disease course. *K. pneumoniae* will grow rapidly on routine laboratory media producing large mucoid colonies , appearing pink on MAC (i.e., indicating their ability to ferment lactose). Confirmatory ID is typically

performed using commercial ID systems using a combination of sugar fermentation and enzyme production or proteomics (i.e., mass spectrometry). *Haemophilus influenza* requires both X (hematin) and V (NAD) factors for growth in culture, therefore, growth will be seen on CHOC, but not blood agar. This organism can be presumptively identified by Gram stain indicating small, gram-negative rods (or coccobacilli) and good growth (within 24 hours) on CHOC (but not on blood) with further confirmation obtained by satelliting around *S. aureus*.