

Q3 2018 Bacteriology



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Specimen 1 - Urine - 65 year old Female, Dysuria

Organisms	Extent	1	2	3	4	5	Total
792 - Enterococcus faecalis		0	1	33	26	4	64
791 - Enterococcus sp.; NOS		0	2	36	0	0	38
985 - Organism is gram-positive		1	0	13	0	0	14
994 - Growth of gram-positive organisms		4	0	1	0	0	5
895 - Streptococcus sp.; Group D;enterococcus		0	0	4	0	1	5
943 - Aerobe found; but referred for ID		2	0	0	0	0	2
793 - Streptococcus faecalis		0	0	1	1	0	2
798 - Escherichia sp.; NOS		0	0	0	1	0	1
787 - Enterobacter sp.; NOS		0	0	1	0	0	1
989 - Klebsiella; Staphylococcus or Streptococcus		0	0	1	0	0	1
799 - Escherichia coli		0	0	1	0	0	1
983 - Organism is gram-negative		0	1	0	0	0	1
894 - Streptococcus sp.; Group D		0	0	1	0	0	1
TOTAL PARTICIPANTS							136

Flagging appears for failure to report 787, 791, 792, 793, 881, 894, 895, 942, 943, 985, 989 or 994.

In addition to the required organism, participants in all extents may report (No additional codes).

This sample contained *Enterococcus faecalis*.

The urine culture (obtained from indwelling Foley catheter) for this hospitalized patient grew $>10^5$ colony forming units per milliliter (CFU/mL) of pure, nonhemolytic colonies on blood agar, positive for L-pyrrolidonyl- β -naphthylamide (PYR). The uropathogen was identified as *Enterococcus faecalis*. The urinary tract is the most common site from which clinical strains of enterococci are recovered. Although a common cause of community acquired urinary tract infections (UTIs), enterococci are most often associated with nosocomial UTI, particularly in patients with urinary catheterization. The presence of $>10^5$ CFU/mL of a pure uropathogen from an inpatient's urine culture warrants a full identification and susceptibility. Management should include removal of urinary catheters if possible; this intervention alone has been observed to resolve enterococcal urinary catheter-associated infections/colonization in some cases. Although enterococci are intrinsically resistant to low concentrations of β -lactam antibiotics, these agents (e.g., ampicillin) are still the first choice for uncomplicated UTIs (i.e., alternatives: nitrofurantoin or fosfomycin (*E. faecalis*)). For urinary tract infections due to ampicillin- and vancomycin-resistant strains, linezolid or daptomycin may be used.

Specimen 2 - Throat - 14 year old Male, Fever, severe sore throat

Organisms	Extent	1	2	3	4	5	Total
923 - Pos for Grp A strep screen by culture		2	9	43	4	0	58
886 - Streptococcus sp.; beta-hemolytic Grp A (S. pyogenes)		0	1	22	6	3	32
887 - Streptococcus pyogenes		0	1	8	10	2	21
985 - Organism is gram-positive		1	2	12	0	0	15
921 - Pos for beta-hemolytic strep screen		0	2	2	0	0	4
943 - Aerobe found; but referred for ID		2	0	0	0	0	2
976 - Pos for strep Group A antigen		0	0	2	0	0	2

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898 - Streptococcus agalactiae	0	0	1	0	0	1
	TOTAL PARTICIPANTS					135

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 898.

This sample contained *Streptococcus pyogenes*, Group A and alpha Strep & *Neisseria* sp.

Infection is the most common cause of sore throat (with or without fever) and the causative agents of pharyngitis in children and adolescents are usually a viral etiology (e.g., rhinovirus, coronavirus, influenza viruses (A or B)) or group A Streptococcus (GAS). Culture of this patient's throat swab displayed 4+ growth of *Streptococcus pyogenes* also referred to as Group A β-hemolytic streptococcus (GABHS; based on the Lancefield classification for grouping streptococci according to their carbohydrate cell wall antigens) and 1+ *Neisseria* spp. The presence of any β-hemolytic streptococcus grown in a throat culture should be evaluated for possible clinical significance. Accordingly, any β-hemolytic, catalase-negative, gram-positive cocci in pairs and/or chains can be confirmed as *S. pyogenes* by either: 1) positive PYR test; 2) positive result for GABHS antigen with immunological grouping test; or 3) positive DNA probe test. Lastly, the presence of *Neisseria* spp. in this culture reflects the presence of commensal organisms in the oropharynx and should be reported as such (e.g., "Usual upper respiratory microbiota"). However, one should be sure to investigate predominant oxidase positive, gram-negative diplococci (i.e., not growing on blood agar) to rule-out gonococcus (e.g., pattern of oxidation of carbohydrates, and other selective tests).

Specimen 3 - Ear - 8 year old male, Earache, bronchitis

Organisms	Extent	1	2	3	4	5	Total
823 - Moraxella catarrhalis	0	2	19	13	4	38	
822 - Moraxella sp.; NOS	0	1	25	1	0	27	
874 - Staphylococcus sp.; coagulase-negative; NOS	0	1	17	3	1	22	
983 - Organism is gram-negative	6	3	5	0	0	14	
878 - Staphylococcus epidermidis	1	0	8	3	0	12	
943 - Aerobe found; but referred for ID	6	1	5	0	0	12	
718 - Normal flora found, not normally reported	1	0	2	1	1	5	
985 - Organism is gram-positive	1	0	3	0	0	4	
825 - Neisseria sp.; NOS	0	0	3	0	0	3	
873 - Staphylococcus sp.; NOS	0	0	2	0	0	2	
821 - Micrococcus luteus	0	0	1	0	0	1	
922 - Neg for Grp A strep screen by culture	1	0	0	0	0	1	
877 - Staphylococcus aureus	0	0	1	0	0	1	
799 - Escherichia coli	0	0	1	0	0	1	
948 - No pathogens isolated	0	0	1	0	0	1	
805 - Haemophilus sp.; NOS	0	0	1	0	0	1	
	TOTAL PARTICIPANTS					145	

Flagging appears for failure to report 825, 823, 822, 922, 943 or 983.

In addition to the required organism, participants in all extents may report 718, 873, 874, 878, and 985.

This sample contained *Moraxella catarrhalis* and *Staphylococcus epidermidis*.

The case patient was suffering from persistent inflammation of the middle ear (i.e., acute otitis media) and a middle respiratory infection. Culture of the middle ear fluid confirmed the causative agent by pure growth of the pathogen, *Moraxella catarrhalis*. While tympanocentesis and culture of the middle ear fluid constitute a valuable tool for a definitive diagnosis, such diagnoses are typically made on clinical grounds, due to the invasive nature of this technique. *M. catarrhalis* is a gram-negative diplococcus that appears as medium-to-large and dome-shaped whitish colonies on blood and chocolate agar (i.e.,

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its growth is inhibited on MacConkey and CNA). Identification of this organism can be made based on the Gram stain (gram-negative diplococcus), positive oxidase and butyrate tests, along with the observation that colonies that move when pushed on solid agar. As alluded to, pursuing a microbiologic diagnosis is generally reserved for patients with acute otitis media or acute bacterial rhinosinusitis who have failed empiric antibiotic therapy, patients with severe COPD exacerbations, or patients who may otherwise benefit from directed antibiotic therapy

Specimen 4 - Stool - 22 year old Female, Abdominal pain, diarrhea

Organisms	Extent	1	2	3	4	5	Total
941 - Neg for Sal & Shig (referred for Vib; Yers & Campy culture)		1	1	23	2	1	28
799 - Escherichia coli		1	1	17	3	0	22
763 - Campylobacter sp.; NOS		0	2	9	3	1	15
983 - Organism is gram-negative		8	1	3	0	0	12
939 - Neg for Sal; Shig & Yers (referred for Vib; Campy culture)		0	0	8	0	0	8
765 - Campylobacter jejuni		0	0	1	3	3	7
930 - Normal Enteric flora no pathogens isolated		0	2	2	1	1	6
943 - Aerobe found; but referred for ID		3	0	0	0	1	4
937 - Neg for Sal; Shig & Campy (referred for Vib & Yers culture)		0	0	3	0	0	3
934 - Neg for Sal; Shig; Yers & Vib (referred for Campy)		0	0	3	0	0	3
718 - Normal flora found, not normally reported		0	0	0	1	0	1
798 - Escherichia sp.; NOS		0	0	1	0	0	1
948 - No pathogens isolated		0	0	1	0	0	1
869 - Shigella flexneri (Serotype B)		0	0	1	0	0	1
TOTAL PARTICIPANTS							112

Flagging appears for failure to report 763, 765, 934, 939, 941, 943 or 983. Extent 5 941, 839, 763, 765, 934, 983
 In addition to the required organism, participants in all extents may report 798, 799, and 930.

This sample contained *Campylobacter jejuni* and *Escherichia coli*.

A stool culture was performed from a fecal specimen for this patient following an abrupt onset of abdominal pain and diarrhea. After a two-day incubation on selective blood-containing agar under microaerobic conditions (5% O₂, 10% CO₂, and 85% N₂ at 42°C, a curved, gram-negative bacterium with darting motility was recovered, and subsequently confirmed as *Campylobacter jejuni* with positive reactivity upon catalase, oxidase and hippurate testing. Intestinal campylobacteriosis is the most common diarrheal illness in the US. These infections are primarily zoonoses that result from the consumption of contaminated food (e.g., poultry), milk or water. *Campylobacter* (especially, *C. upsaliensis*) infections can also arise subsequent to direct contact with domestic animals. The clinical presentation of *C. jejuni* varies from an asymptomatic carrier state to mild enteritis with abdominal cramps and watery diarrhea, to severe disease with dysentery with severe abdominal pain, fever and bloody diarrhea. Most cases are self-limiting (i.e., 2-10 days in duration), but complications, while rare occurrence, include bacteremia, hepatitis, cholecystitis, and autoimmune complications such as Guillain-Barré syndrome and reactive arthritis. By microscopy, *Campylobacter* appears as lightly staining GNR with "gull-wing" appearance. Wet mounts of fresh stool may also reveal characteristic darting motility. For culture, fresh stool should be either set-up with 2 hours or preserved in transport medium (e.g., Cary-Blair) for direct plating onto selective "Campy" agar with or without a pre-enrichment step.

Specimen 5 - CSF - 18 year old Male, Debilitating headaches

Organisms	Extent	1	2	3	4	5	Total
877 - Staphylococcus aureus		3	5	40	20	6	74
829 - Neisseria meningitidis		0	1	11	12	6	30
825 - Neisseria sp.; NOS		0	1	17	2	0	20
943 - Aerobe found; but referred for ID		4	0	9	1	0	14

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983 - Organism is gram-negative	6	2	1	1	0	10
985 - Organism is gram-positive	2	0	3	0	0	5
878 - Staphylococcus epidermidis	0	0	2	0	0	2
873 - Staphylococcus sp.; NOS	0	0	2	0	0	2
875 - Staphylococcus sp.; coagulase-positive; NOS	0	0	2	0	0	2
901 - Streptococcus pneumoniae	0	0	0	1	0	1
973 - Pos for Staph aureus antigen	0	0	1	0	0	1
945 - No anaerobes isolated	0	0	0	1	0	1
819 - Micrococcus sp.; NOS	0	0	1	0	0	1
814 - Klebsiella pneumoniae	0	0	1	0	0	1
845 - Pseudomonas stutzeri	0	0	0	1	0	1
			TOTAL PARTICIPANTS			165

Flagging appears for failure to report 825, 829, 943, 945 or 983 along with 873, 875, 877, 943, 945, 973 or 985.

In addition to the required organism, participants in all extents may report (No additional codes).

This sample contained *Neisseria meningitidis* and *Staphylococcus aureus*.

This previously healthy 18 year-old man, due the acute onset of his debilitating headaches, was worked-up for acute meningitis. Unless lumbar puncture is contraindicated, every patient with suspected meningitis should have cerebrospinal fluid (CSF) obtained as this is a life threatening condition. Examination of the CSF is crucial for establishing the diagnosis of bacterial meningitis, identifying the causative organism, and performing in vitro susceptibility testing. A Gram stain should be obtained whenever there is suspicion of bacterial meningitis as it has the advantage of suggesting the bacterial etiology one day or more before culture results are available. In addition, because the number of organisms can be as low as 10^3 CFU/mL, concentration of the Gram stain by cytocentrifugation is important for rapid diagnosis. For this case patient, gram-negative diplococci and gram-positive cocci in clusters were seen on the initial Gram stain suggestive of meningococcal and potentially an additional secondary staphylococcal infection, as well. Meningococcus was subsequently confirmed by culture (i.e., oxidase positive, glistening nonhemolytic growth on blood agar, and β -glutamyl-aminopeptidase positive). In addition, *Staphylococcus aureus* was also confirmed by culture, as well. For all staphylococci, the tube coagulase should be performed for confirmation of slide or latex coagulase results. While meningococcus is more commonly recovered in clinical scenarios such as this, *S. aureus* meningitis does occur and is seen mostly in the setting of head trauma, neurosurgery (i.e., shunt infections), and can also occur as a complication of *S. aureus* bacteremia.