VIKORSCIENTIFIC KORPATH

Wound-ID Case Review

- **Patient History:**
  - Patient diagnosed with autoimmune disease
  - Chief complaint: two wounds not healing, two failed treatments and getting worse
  - Patient was currently taking ***Tetracycline*** for infection with no avail
  - Patient was two days away from admittance to hospital wound clinic

- **Disease State:**
  - Due to infection getting worse daily and symptoms persisting slight pain, smell of wound and discoloring
  - With autoimmune disease, flare ups may drastically reduce the healing of wounds, paired with detecting ARG's may pose problematic in this case review

- **Why This Test was Ordered:**
  - Physician agreed this patient is a viable candidate for Wound-ID, considered current treatment didn't seem to be effective and progression of wound
  - Physician uses **C/S**, his way of giving back to local private hospital in small town, he partakes in a form of philanthropy and wants to be known for "giving back"

- **Outcome:**
  - Wound-ID report detected three pathogens: A.) *Enterococcus faecalis, faecium 10^6* **(Bacteria)** B.) *Staphylococcus haemolyticus, lugdunensis 10^3* **(Bacteria)** *C.*) *Enterobacter spp. 1 x 10^2* **(Bacteria)**
  - Antibiotic Resistant Genes detected: A.) ***Macrolides*** *B.*) ***Tetracycline***
  - As noted, prior, ***Tetracycline*** was used for treatment and failed, now we know why
  - Therapy recommendations listed in First Line and Second Line target detected bacterial organisms, Notes from Provider also helped guide treatment (see report pg.2)
  - Patient outcome post Vikor recommended treatment: 24 hours after PharmD recommended treatment the smell of the infection was gone, day 2 a noticeable difference in the wound, day 3 drastic difference. Patient was never checked into the hospital's wound clinic.
  - By doing a follow up with provider on the efficacy of our Wound-ID reporting and basing it off the patient outcome, the provider said this: "More than I want to be known for being a philanthropist, I want to be known as a good thorough doctor. There are things that I am missing by not using you more and that changes today."

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VIKORSCIENTIFIC

22 WestEdge Street 8th Floor
Charleston, SC 29403
Ph# (854) 429-1069• Fx# (833) 247-4091
www.vikorscientific.com

Wound-ID™
Molecular Pathogen Report

CAP ACCREDITED #8359749

CLIA #42D2150400

Patient Name	Date of Birth	Gender	Race

Facility Information

Ordering Provider:
Facility:
Facility Phone:
Facility Fax:

Specimen Information

ACC: #
Collection Date: 06-23-2021
Received Date: 06-24-2021
Notes:
Report Date: 06-25-2021
Sample Type: Wound Swab

Laboratory Results

PATHOGENS DETECTED

Enterococcus faecalis, faecium	1 x 10^6 copies/uL	99.89%
Staphylococcus haemolyticus, lugdunensis	1 x 10^3 copies/uL	0.1%
Enterobacter spp.	1 x 10^2 copies/uL	0.01%

RESISTANCE GENES DETECTED & POTENTIAL MED CLASS AFFECTED

ermC, ermB	Macrolides
tetM	Tetracycline

ABXAssist™

Pharmacy Guidance Provided by: Advance Therapeutic Assist

Electronically approved on 06-25-2021 by: Dallas Hofmann
•Email: pharmconsult@vikorscientific.com • Phone: 1-855-742-7635, 1-855-PharmD5

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Clinical Laboratory Improvement Amendments #42D2150400

Patient Name | Date of Birth | Gender | Race

MEDICATION REVIEW

Drug Allergies:	PCN
Notes from Ordering Physician:	
Notes from Pharmacist:	1) The treatment guidance listed is based on infectious disease treatment references, the organisms detected, and genes known to contribute to medication resistance. Important clinical information such as comorbidities, renal function, etc. may influence the overall appropriateness of therapy. The provided guidance only takes drug allergies into account when they are provided. The provider should take the entire clinical presentation into account when making treatment decisions. Not all detected microbes will require antimicrobial therapy as some are part of the normal flora or can be non-pathogenic colonizers. 2) *** mecA gene set detected but failed to report on final pharmacy pdf. Staph sp. detected are typically considered part of the normal flora. Use best clinical judgment to determine whether or not these pathogens require treatment at this time *** Treatment options include Bactrim, Linezolid, Ceftaroline, Daptomycin, Vancomycin or topical Mupirocin +/- Gentamicin for synergy. 3) If treatment of Enterobacter is warranted, may use Bactrim, Levaquin. Moxifloxacin, Zosyn, Cefepime, topical Gentamicin or any OTC topical product containing Polymyxin B. 4) Enterococcus sp. is a part of the normal microflora, but when present at elevated levels it can be pathogenic. Treatment is recommended in symptomatic patients. Bactrim and cephalosporins are not effective. Treatment options include Levaquin (E. faecalis), Moxifloxacin (E. faecalis, E. faecium), Linezolid (E. faecalis, E. faecium), Daptomycin (E. faecalis, E. faecium), topical Neosporin (good Enterococcus coverage) or topical Mupirocin (reserve if possible as resistance is increasing).

	Medication	Route	Dose
FIRST LINE	levofloxacin	oral	500-750mg (PO/IV) QD x 7-14 days Considerations: BBW: Fluoroquinolones have been associated with serious and possible irreversible reactions; tendonitis/tendon rupture, peripheral neuropathy, CNS effects. These may occur all together or months after tx. Increased risk in patients over 60 and pt on corticosteroids. Avoid in Myasthenia Gravis. Adjust dose for CrCl <50ml/min.
SECOND LINE	moxifloxacin	oral	400mg (PO/IV) QD x 7-14 days Considerations: E. faecalis, E. faecium: No renal dose adjustments required; otherwise, same BBW as Levaquin.

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ALTERNATIVE	linezolid	oral	600mg (PO/IV) BID x 10-14 days

Considerations: E. faecalis, E. faecium, Staph Spp: Reserve for severe/refractory infection or if patient cannot tolerate other options (drug of last resort), Caution: SSRI, SNRI, MAOI use or Tyramine rich foods 2 weeks prior/after, uncontrolled hypertension, Will require a PA

Methodology

The infectious disease and antibiotic resistance detection panels are tested utilizing Real-time PCR technology to detect the presence of genes associated with pathogens and antibiotic resistance via amplification of genomic DNA. Amplification and detection are performed using the Applied Biosystems™ QuantStudio™ 12K Flex Real-time PCR system, which includes the QuantStudio™ 12k Software v1.3 and Thermo Fisher Scientific TaqMan™ assays. The assays are preloaded onto TaqMan™ OpenArray plates.

Limitations

This test only detects microorganisms and antibiotic resistance (ABR) genes specified in the panel. ABR genes are detected in the specimen and are not specific to a detected pathogen. ABR genes may be detected in bacterial strains not tested for in the panel.

The resistance genes for Ampicillin, selected Extended-Spectrum-Betalactamases, Vancomycin, Carbapenems, Sulfonamide, Trimethoprim, Aminoglycosides and the Quinolone gyrase groupings are assays customized by pooling the individual genes listed in the associated group. If listed as positive, this indicates that at least one of the genes in the group was detected and the class of medication could have potential resistance.

Disclaimer

This test was developed and its performance characteristics determined by Vikor Scientific™. It has not been cleared or approved by the FDA. The laboratory is regulated under CLIA as qualified to perform high complexity testing. This test is used for clinical purposes. It should not be regarded as investigational or for research. Pharmacy guidance and recommendations therein are not under the purview of the laboratory or agencies which accredit the laboratory.

The treatment guidance listed in the report is based on infectious disease treatment references, the organisms detected, and genes known to contribute to medication resistance. Important clinical information such as comorbidities, renal function, patient weight, platelet count, microbiology results, etc. may influence the overall appropriateness of therapy. The provided guidance only takes drug allergies into account when they are provided and available to the pharmacist making the recommendation. The overall appropriateness of therapy must be determined by the physician treating the patient. The provider has all the patient information necessary to make that determination and should take the entire clinical presentation into account when making treatment decisions. Should the treating physician wish to discuss the provided guidance, the pharmacist is available for consult at the email and phone number provided.

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NEGATIVE PATHOGENS
Acinetobacter baumannii
Anaerococcus vaginalis
Bacteroides fragilis
Bartonella henselae
Campylobacter coli, jejuni
Candida albicans, glabrata, tropicalis, parapsilosis
Candida auris
Citrobacter freundii
Clostridium botulinum
Clostridium difficile Toxin A/B
Clostridium perfringens
Corynebacterium jeikeium, striatum
Enterohemorrhagic E. coli (0157)
Enteroinvasive E. coli
Enteropathogenic E. coli
Enterotoxigenic E. coli
Escherichia coli
Fusobacterium nucleatum, necrophorum
HPV 16
HPV 18
Haemophilus influenzae
Herpes zoster virus (Varicella zoster virus)
Klebsiella oxytoca, pneumoniae
Listeria monocytogenes
Morganella morganii
Mycobacterium abscessus
Mycobacterium fortuitum, chelonae
Mycobacterium kansasii
Mycobacterium marinum
Mycobacterium tuberculosis
Mycobacterium ulcerans
Mycoplasma genitalium, hominis
Pasteurella multocida
Peptoniphilus harei, ivorii
Peptostreptococcus prevotii, anaerobius, asaccharolyticus, magnus
Prevotella spp.
Proteus mirabilis
Pseudomonas aeruginosa
Salmonella enterica
Serratia marcescens
Staphylococcus aureus, enterotoxins A/B
Stenotrophomonas maltophilia
Streptococcus agalactiae
Streptococcus pneumoniae
Streptococcus pyogenes
Trichophyton rubrum
Trichophyton soudanense, violaceum
Trichophyton tonsurans, interdigitale
Vibrio cholerae, parahaemolyticus, vulnificus
Yersinia enterocolitica

NEGATIVE RESISTANCE GENES	ANTIBIOTIC CLASS
aac6-1b/aacA4, ant(3), aph(A6), aac6-1b-cr	Aminoglycosides
ampC, ACC, DHA, ACT/MIR	AmpC beta lactamase
SULL, DFRA	Bactrim
PER-1, PER-2, VEB, blaNDM-1, OXA-1, GES, BlaSHV	Beta-lactams
OXA-23, OXA-40, OXA-58, OXA-72, IMP-16, NDM, blaOXA-48, OXA-48, KPC, VIM, IMP-7	Carbapenems
TEM, TEM E102K, TEM R162S, TEM G238S	Class A Beta-lactams
CTX-M	ClassA Beta-lactamases
ermA	Macrolides
*mecA	Methicillin
mcr-1	Polymyxins
QnrB, Gyrase A D87N_GTT, Gyrase A S83L_TGG, QnrA	Quinolones
VanB, VanA1, VanA2	Vancomycin