

Wisconsin State Laboratory of Hygiene UNIVERSITY OF WISCONSIN-MADISON



WELCOME to the 2021 WCLN Regional Meeting! "The COVID-19 Pandemic Response Olympics"



WISCONSIN STATE LABORATORY OF HYGIENE - UNIVERSITY OF WISCONSIN

Opening Ceremonies

Today's meeting is being live streamed and recorded. Your image and voice may be captured on our broadcast and recorded. Your consent to this is assumed if you remain in the room for the Regional Meeting.



Let the Games Begin!



Audience Participation

We strongly encourage you to participate in the discussions today. This meeting is for you.

- Those in person, please use the microphone stands in the room
- Those attending virtually:
 - Click "raise your hand". When we call on you turn on your video camera and un-mute and we should all be able to see you and hear you speak. (Remember to mute yourself, turn off your camera and lower your hand when you are done speaking.)
 - Or, write your question or comment in the Chat section and it will be read aloud by a moderator. Chat comments/questions are only visible to the host.



Audience Participation

Through out the day we will have interactive polling questions through the Kahoot program. (Polling questions will not be available to those viewing this in the recording after today.)

To participate, use your phone or computer to go to **Kahoot.it** and enter the event code that is provided. . .



WISCONSIN STATE LABORATORY OF HYGIENE - UNIVERSITY OF WISCONSIN

Engaging and Training Future Olympians Making the Proverbial 180: Clinical Laboratory Education in the Pandemic





Erik Munson

Department of Medical Laboratory Science Marquette University

Wisconsin Clinical Laboratory Network Laboratory Technical Advisory Group (LabTAG)

The presenter states no conflict of interest and has no financial relationship to disclose relevant to the content of this presentation.

You Make the Call



KAHOOT

What is your general feeling about online microbiology laboratory education (including practicum)?

- A. I've had some experience with this; it doesn't work.
- B. I've had some experience with this; gets the job done.
- C. No major experience; in theory, should work well.
- D. Get outta here; this won't work.

January 2020 (MLS/CLS/MT juniors)

Marquette University College of Health Sciences Department of Clinical Laboratory Science CLLS 4127/7127, Medical Microbiology, 4 cr. Syllabus Spring 2020

Course Director:	Erik Munson		
Office:	Schroeder Complex 267		
E-mail:	Erik.Munson@marquette.edu		
Phone:	Office: (414) 288-5848		
Office Hours:	Door is open; find me		

CLLS 4127/7127 Medical Microbiology

Laboratory Manual

Erik Munson Marquette University Department of Clinical Laboratory Science

Additional MLS/CLS/MT obligations (juniors)

Clinical Laboratory Science CLLS 4173 / 7173	Clinical Laboratory Science CLLS 4174 / 7174	
Clinical Chemistry and Concepts 2	Clinical Hematology I	
Syllabus Spring 2020	Syllabus Spring 2020	
Lecture Monday, Wednesday and Friday 9:00 – 9:50 am	Lecture Monday, Wednesday and Friday 10:00 – 10:50 am	
Class Cramer Hall 038	Class Cramer Hall 038	
DiscussionThursday 9:00 - 9:50 amClassCramer Hall 038	DiscussionThursday 10:00 - 10:50 amClassSchroeder Complex 256	
LaboratoryTuesday 2:00 pm - 4:50 pmClassSchroeder Complex Room 299	LaboratoryTuesday 8:00 am - 11:50 amClassSchroeder Complex Room 299	
Instructor Valerie Everard-Gigot, Ph.D., MT (ASCP); Clinical Assistant Professor;	Instructor Valerie Everard-Gigot, Ph.D, MT (ASCP); Clinical Assistant Professor;	
Schroeder Complex Room 264D	Schroeder Complex Room 264D	



January 2020 (senior nursing students)

MARQUETTE UNIVERSITY COLLEGE OF NURSING HEAL 4930 Special Topics in Health--Microbiology Section 101 Syllabus, Spring 2020

- Course Description: This special topics course will provide an overview of clinical and medical microbiology as it relates to the nursing profession. The course will include a survey of the structure, function, transmission, diagnosis, and control of common microorganisms. Special emphasis will be placed on the ancillary role of the clinical microbiology laboratory in the diagnosis of infectious diseases.
- Credits: Four
- Prerequisites: None
- Faculty: Erik Munson, Department of Clinical Laboratory Science
- Office: Schroeder Complex 267 Phone: (414) 288-5848 Email: erik.munson@marquette.edu
- Office hours: Tuesdays 1300 to 1600

March 2020 (MLS/CLS/MT juniors)

W Feb 26		Lab Prep; Antimicrobial Discussion III, IV	Finish up mold contaminants Finish up slide culture (Wed.)	
Th Feb 27	Mycology introduction	Bonus Round (1000): Opportunistic molds	Mold pathogens Begin mold mini-unknown	
F Feb 28	Opportunistic molds	Bonus Round (1000): Pathogenic molds		
M Mar 2	Pathogenic molds			
W Mar 4		WRITTEN EXAMINATION II	Yeasts	
Th Mar 5	Yeast		Finish mold mini-unknown Mycology Review Sheet	
F Mar 6	Yeast			
Mar 9-13	<pre>\$pring Break (no cla\$\$)</pre>			

• March 2020 (senior nursing students)

Week	Lecture/discussion date	Laboratory date	Tentative topic(s)
6	February 17		Gram-negative coccobacilli Gram-negative diplococci Miscellaneous Gram-negative bacilli Spirochetes <i>Chlamydia</i> and <i>Mycoplasma</i>
		February 19	<u>Haemophilus</u> spp. Neisseria spp., Moraxella spp.
7	February 24		Written examination #1 Anaerobes Acid-fast bacilli
		February 26	Anaerobes; aerotolerance testing Introductory mycobacteriology
8	March 2		Basic molecular biology Molecular diagnostics
		March 4	Laboratory mini-practical examination PANTHER exercise
\$\$	March 9	March 11	No class; spring break No laboratory; spring break

TIMELINE (Spring Break)



Oh, #\$%@

 \bigcirc





#\$%@STORM

Number of Specimens Tested, Positive and the Percent Positive for COVID-19 by PCR at Wisconsin Laboratories



#\$%@STORM



WHAT DO WE DO NOW (Friday)?











CAN WE PULL THIS OFF (still Friday)?

- Conversion (everything) to electronic
- Which modality/format?

We've recorded PowerPoints before; D2L Accountability "Getting Emails at 0300" Microsoft Teams...but NO HELP/RESOURCES

- Additional rumblings that faculty on-campus presence will be limited (laboratory offerings)
- Evaluations (intra-student collaboration?)

AD

MAJOR ITEMS FALL INTO PLACE

- Set up meetings in Microsoft Teams via Outlook (major assist to College of Nursing--they were scrambling for a different reason)
- A major heist
- "Essential"
- Having an 18-year-old son in college



THE HEIST



THE ROLL OUT (Saturday)

Mass communication

- Changing expectations Synchronous Most of their friends have another week off Some of these people may not be coming back
- How to "attend class"

They've never been on Teams, either Screen-shot tip sheets (major assist to Matthew)

Drive-up meetings to distribute printed materials

MONDAY, MONDAY (the 16th)

O830-1130 Nursing students

Mycology PowerPoint lectures on Teams Synchronous Everyone showed up (sorry, those from California) Five-point lecture quiz via Email

• 1200-1300 MLS/CLS/MT students



Specimen Collection lecture on Teams Synchronous Everyone showed up (one with bandwidth problem) Five-point lecture quiz via Email

UNKNOWNS WITH MLS JUNIORS

Cultivate "clinical unknowns" on multiple media

Snap digital images (iPad), upload to D2L Everyone in class has access to "all" unknowns Assign set of images the night before

Day 1 laboratory: come with a game plan

Predominant organism/potential pathogen? Erik will confirm Gram stain reaction (when asked) What is your initial biochemical screen? Which tests do you want?

Day 2 laboratory: read reactions, ID, rationale

SPECIMEN SOURCE: SPUTUM



UNKNOWNS WITH MLS JUNIORS

https://web.microso ftstream.com/video /f37fd7ee-1ea1-48f6-8852-1435147c8ba1

Long Dorian conversation

M35 EXERCISE WITH NURSES

Receive case presentation in advance

> We've discussed all organisms in previous lectures We've seen all organisms in previous lab sessions

Case B (Kristen and Annie): 36-year-old female admitted to tertiary care M35-A2 facility burn unit; specimen submitted was tissue

Vol 28 No 29 Replaces M35-A Vol. 22 No. 18

Abbreviated Identification of Bacteria and Yeast; Approved Guideline—Second Edition

Describe CLSI M35 document (with selected examples) just prior to beginning exercise

M35 EXERCISE WITH NURSES

https://web.microso ftstream.com/video /fc58a3d2-3eb2-4edb-863a-57fdf91dafdc

Short Dorian conversation

LIVE MICROSCOPY

https://web.microso ftstream.com/video /12c0597a-9015-4c6f-a158c75dad0dc451

Matthew conversation

Laboratory Practical (no "rotations")



QUESTION 6



TSI OF tubes

Mueller Hinton agar

QUESTION 9 (two parts)



TSI LIA Motility Indole MIO (Ornithine) Citrate Urea Phenylalanine VP DNase

QUESTION 20B



Microscope to Follow

QUESTION 25 (two parts)

Microscope Demonstrations

QUESTION 2 (three parts)






Left Side

Right Side

LEV levofloxacin CIP ciprofloxacin CFZ cefazolin FEP cefepime CAZ ceftazidime ERT ertapenem MER meropenem AZT aztreonam

AMP ampicillin TOB tobramycin A/S amp-sulbactam CAX ceftriaxone P/T pip-tazobactam FOX cefoxitin NIT nitrofurantoin T/S trimeth-sulfa GEN gentamicin

Broth Microdilution

Refer to your protocol for Growth ap & dilutions/concentrations No growth





Final Thoughts (Erik)



WHAT HAPPENED IN LATE 2020/2021?

 Small class sizes facilitated in-person didactic and laboratory education (to a degree)



• Spring 2021

LOTS of catch-up with the new MLS juniors Face coverings in lecture; N95 in laboratory

THE GOOD

- "We got to hear about everyone else's unknown--not just our own!"
- Regurgitation during live microscopy



- Now offer "Late Night Microscopy" review sessions
- Practical examination on PowerPoint/Teams not the worst thing in the world

Don't have to worry about "OMG, it didn't grow" Less prep time; less co\$t May be beneficial/fair for large class sizes

THE BAD

- What are they really doing (lecture)?
- THEY'RE NOT ASKING QUESTIONS
- What are they really doing (exams)?



- Hemolysis, AST, molds do not digitize well; cannot sniff in TV Land
- Tactile skills (a.k.a. practice)

Streaking for isolation Finding something on oil immersion (coccobacilli) 3D aspect of microbes (LPCB; protozoa)



AMOEBAE



Entamoeba histolytica/dispar trophozoite (trichrome, 100X)

MOEBAE



Entamoeba histolytica same troph (RBC; trichrome, 100X)

THE UGLY

Lose an organization tool when not in front of them

- Lose a motivational tool when not in front of them
- Loss of collaboration/camaraderie
- Bandwidth and delays
- Are they going to be ready for clinicals?





You Make the Call



KAHOOT

Has your opinion of on-line microbiology laboratory education (practicum) changed after listening to this?

- A. Yes, this could work.
- B. Yes, we're screwed.
- C. My opinion did not really change.
- D. I am a stubborn Scandinavian (or other applicable heritage) and am not a huge fan of change.



Final Thoughts (Your Turn)



ACKNOWLEDGMENTS

Valerie Everard-Gigot, Ph.D., MT(ASCP) Matthew Munson Dorian Weir Erin Bowles Jim Hermanson



Sarah Alhakimi **Brittany Cassel** Lauren Crudo Tracy Le Madi Leafblad Jezabel Ninaja Villa Laura Perez Raya **Peter Stahlberg Kristina Viegut**

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Engaging and Training Future Olympians

Laboratory Panelists and Audience:

How has the COVID-19 pandemic affected your ability to engage and train:

- Students who will comprise our future workforce?
- New employees?
- Have you had any issues hiring staff?



Diving Into the Unknown





Diving into the Unknown The Start of a Pandemic

Alana Sterkel, PhD, D(ABMM), SM(ASCP)CM Associate Director, Communicable Disease Division Wisconsin State laboratory of Hygiene





Welcome Back!

Olympic High Dive





The Fire is Lit



Worldwide case/day





https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html



COVID-19 in Wisconsin





Data collected by voluntary reporting from public, private, and commercial laboratories in Wisconsin. All data are estimates and do <u>not</u> reflect actual number of tests performed in the state. Capacity is dependent on availability of test supplies and adequate staffing

Wisconsin Clinical Laboratory COVID-19 Test Methods (Last updated 2/15/2021 8:45:17 AM)

GeneXpert 55	ID Now 35	BioFire 14	QuantStudio 9	Diasor 6	rin
		BDMax 10	Other (not listed) 5	EZ1 3	Manual
	Sofia 28			Managall	
		Panther	BinaxNOW 4	2	
		10			
			Cobas		

Feb 2021

Hurdles in Our Path

- We've seen supply shortages
- We've seen overfull hospitals
- We've seen demands for testing we couldn't provide
- We've been bombarded with rapidly changing information
- We've navigated demands from our hospitals and doctors
- We've battled against spreading mis-information
- We've managed changes to our own lives



Purpose

- Learn from our successes and from our mistakes
- Share our experiences
- This has been profoundly life changing and emotional
- Take care with your words, let's build each other up today

Diving Into the Unknown

All Panelists:

When you first heard about the declaration of the COVID-19 pandemic, what were your:

- First thoughts?
- First actions?

What partners did you connect with and why?

What resources did you refer to or utilize?

Diving Into the Unknown

Audience:

When you first heard about the declaration of the COVID-19 pandemic, what were your:

- First thoughts?
- First actions?

What partners did you connect with and why?

What resources did you refer to or utilize?









Laboratory Panelists:

What were some of the obstacles that you had to hurdle early on in the pandemic to continue to provide <u>routine</u> laboratory testing?



Infection Prevention Panelist:

What were some of the obstacles that you had to hurdle early on in the pandemic to continue to provide safe <u>routine</u> care?



State/Local Public Health Panelists:

What were some of the obstacles that you had to hurdle early on during the COVID-19 pandemic?



Audience:

Were there other obstacles that haven't been mentioned yet that you had to hurdle to provide <u>routine</u> laboratory testing or care?

Kahoot



- A. Laboratory
- **B.** Infection prevention
- C. Local public health
- **D.** State public health

Kahoot



If you work in the laboratory, which of the following most closely describes your workplace?

- A. Clinic
- B. Hospital ≤25 beds
- **C.** Hospital >25 and \leq 100 beds
- D. Hospital >100 beds)

Kahoot



Did you implement SARS-CoV-2 testing in your laboratory? A. Yes

B. No
Kahoot



Did you use, or are you still using a commercial reference laboratory for SARS-CoV-2 testing?

- A. Yes we did, until we could bring on testing, but we are no longer doing so and are currently testing in-house.
- **B.** Yes we did, and we are still using a reference lab for testing.
- **C.** No, we are part of a healthcare system and all our testing is referred to one location within our healthcare system.
- D. No, once commercial testing was available we've performed all testing in-house.



Clearing the Hurdles and Sprinting to the Finish Line

Laboratory panelists and audience:

If you implemented SARS-CoV-2 testing, what strategy did you use to determine what assay(s) you would use?

Did you have to modify your testing strategy and why?

What type of screening testing did the laboratory perform (presurgical, employee) and how?



Clearing the Hurdles and Sprinting to the Finish Line

Panelists and Audience:

Did the obstacles you had to hurdle change as the pandemic continued and if yes, how did they change?



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WORK LIFE BALANCE Sticking the Landing

Bob Leschke, MD, CPCC

WORK LIFE BALANCE?

WORK LIFE BALANCE?



WORK LIFE BALANCE!

20



• We all have parts of our jobs that are dissatisfying (some more than others)

• We all have places we would rather be (much of the time)

PLACE OF CHOICE



Recharging the battery when it is depleted.

and the fail



Keeping the battery from depleting as quickly.

132111534

COVID has made it hard . . .

- Lockdowns
- Social distancing
- Lack of travel
- Home schooling





COVID has made it hard . . .

- Our volume of work is greater.
- The kind of work is different.
- In some cases the work is more dangerous.
- Working with less resources.
- "It doesn't have to be this way!"
- "When will it get back to normal?"

LOCUS OF CONTROL

The sense that we have some say in what happens and that our actions make a difference in the outcome.

Focus on the places that you have some control and stop trying to control what you can't.





Hope

Agency + Plan

BOUNDARIES & TRADE OFFS



YES

to?

What are you willing to say

NO

to?

WHAT WILL YOU

WHO WILL YOU



SELF COMPASSION

Aware

- We must be willing to believe that we are hurting.
- We have our own special reasons why things are hard and we can share those reasons with others.





Worthy

- We must believe that we are deserving of relief.
- "Everyone is hurting now so I can wait."

Enough

We must believe that care for ourselves does not come at the expense of others. you cannot pour from an empty cup



Selfish

- Put on your own mask before you help others.
- Good kind of "selfish".

STRATEGIES

At work strategies

- Three deep breaths
- Meditative hand washing
- Body checks
- Totems
- Step away from your environment





Make home your home

- Transition point on the way home.
- Decide what the first 15 minutes look like.
- Avoid one-upsmanship.
- Have electronic free time.
- If you must do work at home, have a specific place you do that and leave it there.
- Every study of resilient relationships shows that it really is *quality* over *quantity*.



Additional Strategies

- Three good things
- Forward thinking

STICK THE LANDING!

Start where you are. Use what you have. Do what you can.





WORK LIFE BALANCE Sticking the Landing

Bob Leschke, MD, CPCC

http://leschkecoaching.com • leschkecoaching@gmail.com



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Building the Team and Passing the Baton

Panelists:

Responding to the pandemic required teamwork. Describe how the process worked in your facility and who your team was comprised of.

Did the roles of the team members change and evolve over the course of the pandemic?
Audience:

Responding to the pandemic required teamwork. Describe how the process worked in your facility and who your team was comprised of.

Did the roles of the team members change and evolve over the course of the pandemic?

Laboratory Panelists:

What were your initial goals for testing capacity and what is your test capacity now?

What impacted your test volume and capacity?

Laboratory Audience:

What were your initial goals for testing capacity and what is your test capacity now?

What impacted your test volume and capacity?

Panelists and Audience:

Were you able to pass the baton successfully?

Victory Lap for the Gold Medal Laboratory Heroes



Lunch – Back at 12:45 PM



Laboratory Panelists:

How do you feel about your laboratory's overall response to the COVID-19 pandemic?

Audience:

How do you feel about your laboratory's overall response to the COVID-19 pandemic?

How do you feel about the WCLN's overall response to the COVID-19 pandemic?

Infection Prevention Panelist:

How do you feel about your infection prevention overall response to the COVID-19 pandemic?

Audience:

How do you feel about your facilities infection prevention overall response to the COVID-19 pandemic?

How do you feel about infection preventions overall response to the COVID-19 pandemic?

Public Health Panelists:

How do you feel about your public health department's overall response to the COVID-19 pandemic?

Audience:

How do you feel about your local public health department's overall response to the COVID-19 pandemic?

How do you feel about the state public health department's overall response to the COVID-19 pandemic?

Laboratory Panelists and Audience:

What changes have you made in the laboratory as a result of the pandemic that you will keep moving forward?



Infection Prevention Panelists and Audience:

What changes have you made in infection prevention as a result of the pandemic that you will keep moving forward?



Public Health Panelists and Audience:

What changes have you made in public health as a result of the pandemic that you will keep moving forward?

All Panelists and Audience:

When the next pandemic occurs, what will you do that worked well with the COVID-19 pandemic and what will you do differently?

Rugby, Fencing, or Synchronized Swimming?









Andrea Pitkus, PhD, MLS(ASCP)^{CM} Disclosures

 I am a paid employee of the University of Wisconsin-Madison and member of the Problem Concept Maps (ProMaps) team

ProMaps is housed in the Department of Medicine in the School of Medicine and Public Health at UW-Madison



kal Delister = 1,9 × DELETING (MALENSE) NEMOCRIW PONTICISEVING - TRABILICE ALS DIVA BINICIDE MEEO (CCHCR)

Agenda

- □ What is a Patient Problem?
- ProMaps and the Problem Oriented View
- Laboratory Role and Value
- Clinical Decision Support LOINC Considerations
- Communications
- Questions?





Discuss ways laboratory data can be utilized in aiding clinical decision making

Improve Cross Disciplinary Communication

What is a Patient Problem?



Department of Medicine UNIVERSITY OF WISCONSIN SCHOOL OF MEDICINE AND PUBLIC HEALTH

The Problem

- Office of the Coordinator for Health IT (ONC) <u>defines</u> a problem as "information about a condition, diagnosis, or other event, issue, situation or clinical concept that is documented."
- An elevated cholesterol (result or finding) may warrant "lipidemia" be added to problem list
- It is mapped to International Classification of Diseases (ICD) or SNOMED CT codes in the electronic health record and LIS.

Problems and The Problem List

- The problem list contains current and past (resolved) patient problems
- □ Why is this important?
- Physicians organize their work around patient problems. CMS requires ICD codes for billing.
- An HIV problem may warrant lab orders for HIV testing or CD4 levels for monitoring, diagnosing or treating the problem and medications such as Nucleotide Reverse Transcriptase Inhibitors or Antifungals

The Problem: Clinician Burnout



Cognitive Overload

Clinician Burnout



The.....split-attention effect¹ occurs when clinicians must interact with multiple sources to acquire and synthesize information.....

In just three years, physician burnout increased from 45.5 percent to 54.4 percent, according to a paper authored by doctors at the University of California, Riverside School of Medicine.

American Journal of Medicine, August, 2018

Stanford's Chief Wellness Officer Aims To Prevent Physician Burnout

Washington Post, August 3, 2018

The Widespread Problem of Doctor Burnout

New York Times, August 23, 2012

The Solution: Problem Oriented View (POV)

Dr. Larry Weed fathered the Problem Oriented Medical Record (POML) which organizes relevant data for the patient's diagnoses

Wright, A., Sittig, D. F., McGowan, J., Ash, J. S., & Weed, L. L. (2014). <u>Bringing</u> <u>science to medicine: an interview with Larry Weed, inventor of the problem-oriented</u> <u>medical record.</u> *Journal of the American Medical Informatics Association : JAMIA*, *21*(6), 964–968. https://doi.org/10.1136/amiajnl-2014-002776

POV also reduces cognitive burden to find results amidst the data deluge clinicians face with EHRs today

Buchanan J. <u>Accelerating the Benefits of the Problem Oriented Medical Record</u>. *Appl Clin Inform*. 2017;8(1):180-190. Published 2017 Feb 15.

Problem Lists



The Solution

Current State: The Problem List



Future State: Problem Oriented View

NEUROLOGIC

v Epilepsy [M L I P C H]

Meds

lamOTRIGINE (LAMICTAL) 100MG tab	Take 2 tabs (200mg) in the AM & 1.5 tabs (150mg) in the PM. (Take crushed per G-Tube)	105 tab	6 ordered	6/10/2015
midazolam (VERSED) 2MG/ML syrup	Give 7ml per g-tube for seizures greater than 5 minutes. Limit once daily.	100 mL	3 ordered	7/2/2015

Labs

LAMOTRIGINE 4.8 1/11/2014

Imaging

9/12/2012 MRI HEAD W & W/O CONTRAST

Impression: 1. Findings compatible with bilateral Sturge-Weber syndrome with associated

Procedures

 I2/14/2012
 Routine EEG

 CLINICAL INTERPRETATION: This EEG recording is abnormal due to generalized

slowing and disorganization.

Clinic Notes

3/11/2015	Epilepsy	Dr. Stanley
9/23/2014	Neurosurgery	Dr. Livingstone

Hospitalizations

7/31/2014	Neurosurgery	Dr. Livingstone
8/2/2013	Neurology	Dr. Stanley

²Buchanan J. <u>Accelerating the Benefits of the Problem Oriented Medical Record</u>. <u>Appl Clin Inform.</u> 2017;8(1):180-190. Published 2017 Feb 15.

Problem Oriented View^{1,2}

An EHR that organizes relevant patient information for a disease in one window as described above reduces the consequences of split-attention effect.

ProMaps and the Problem Oriented View



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Selected Problem Statuses

Maps: Existing, Under Construction and Planned

Listing by Specialty

Specialty	Problem Name	Map Status
Allergy	Asthma	Planned
	Urticaria and Angioedema	Planned
Cardiology	Cardiac Arrhythmia	Released
	Cardiomyopathy	Fully Validated
	Coronary Artery Disease	Released
	Dyslipidemia	Released
	Heart Failure	Released
	Hypertension	Released
	Thromboembolic Disease	Reviewed by MD
	Valvular Heart Disease	Draft completed

Hematology	Anemia	Released
	Hemochromatosis	Planned
	Chronic Myeloid Leukemia	Planned
	Chronic Lymphocytic Leukemia	Planned
Infectious Disease	HIV and AIDS	Planned
	Lyme Disease	Planned
	Osteomyelitis	Planned

www.problemlist.org

Map Creation Process

- Modified Delphi Technique to achieve expert consensus via Google Sheets (lab ballot)
- Lab / LOINC expansion of different test results by a medical laboratory scientist
- Physician QA review / scope
- Build Files and Release Online

COPD Medication	S			Ohio State	Van	derbilt	Stanfor	d I	U. Washingto	n U.Wisco	nsin	UT-SW	COPD Medic	ations				Ohio State	Van	Iderbilt	Stanfo	rd I	U. Washing	ton	U.Wisconsin	UT-SW
				Allen	Rid	nmond	Kuschner	r	Horan	McCartn	ру	Glazer						Allen	Rid	shmond	Kuschn	er	Horan		McCartney	Glazer
Additional Med Suggested by:	Pharm Subclass	Medication	Ohio Jatego Vote	o orj #	anderbi Sategor Vote	2	Stanforc Category Vote	2	ushingti ategorj Vote	U. /isconsl >ategory Vote	:	UT-SW \$ategory Vote	Additional Suggested	Med Phar by:	m Subclass	Medication	Ohio Satego Vote	•	anderb Sategor Vote	1	Stanforc Category Vote	5	U. shingti ategory Vote	71	U. sconsi itegory Vote	UT-SW >ategorj Vote
	Antiasthmatic - MoNclonal Antibodies	Mepolizumab		Asthma, Nt COPD			Y							Antiasthma Antibodies	atic - MoNclonal	Mepolizumab	Y	Asthma, Nt COPD	Y		Y		Y		y.	¥
	Antiasthmatic - MoNclonal Antibodies	Omalizumab		Asthma, Nt COPD			Y						\rightarrow	Antiasthma Antibodies	atic - MoNclonal	Omalizumab	y	Asthma, Nt COPD	Y		Y		Y		Y	¥
	Antiasthmatic - MoNclonal Antibodies	Reslizumab		Asthma, Nt COPD			Y							Antiasthma Antibodies	atic - MoNclonal	Reslizumab	Y	Asthma, Nt COPD	Y		Y		y		v	¥
	Anti-Inflammatory Agents	Cromolyn Sodium	у	Inhaler Nw off the market	Y		Y		n	n		y		Anti-Inflam	matory Agents	Cromolyn Sodium	y	Inhaler Nw off the market	Y		Y		n		n	×
	Bronchodilators - Anticholinergics	Aclidinium Bromide	Y		Y		Y		y	y		Y	On-line	Bronchodil Anticholine	ators - ergics	Aclidinium Bromide	Y		Y		Y		y		Y	¥
	Bronchodilators - Anticholinergics	Ipratropium Bromide	Y		Y		Y		y	y		Y	interestion	Bronchodil Anticholine	ators - ergics	Ipratropium Bromide	Y		Y		Y		v		Y	Y
	Bronchodilators - Anticholinergics	Ipratropium Bromide HFA	Y		Y		Y		y	y .	_	Y	interaction	Bronchodil Anticholine	ators - ergics	Ipratropium Bromide HFA	Y		Y		Y		Y		Y	¥
	Bronchodilators - Anticholinergics	Tiotropium Bromide MoNohydrate	Y		Y		Y		y	y		Y	and phone	Bronchodil Anticholine	ators - ergics	Tiotropium Bromide MoNohydrate	÷.		Y		Y		y		Y	*
	Bronchodilators - Anticholinergics	Umeclidinium Bromide	Y		Y		Y		y	y		Y	diaguasian	Bronchodil Anticholine	ators - ergics	Umeclidinium Bromide	Y		Y		Y		v		v	¥
	Leukotriene Modulators	Montelukast Sodium	Y	_	Y		Y	_	Y	Y		N	discussion	Leukotrien	e Modulators	Montelukast Sodium	Y		Y	1000	Y		y		v	N
	Leukotriene Modulators	Zafirlukast	Y		Y		Y	_	Y	Y	-	N	-	Leukotrien	e Modulators	Zafirlukast	Y		Y		Y		y		Y	N
	Leukotriene Modulators	Zileuton	Ŷ	_	Ŷ		Y	_	Y	γ		N	-	Leukotrien	e Modulators	Zileuton	Y		Y		Y		Y		Y	N
	(PDE4) Inhibitors	Roflumilast	Y		Y		Y		Y	Y	_	Y		Selective P (PDE4) Inhi	hosphodiesterase bitors	4 Roflumilast	¥		Y		Y	-	v	_	v	¥
	Steroid Inhalants	Beclomethasone Dipropionate	Y		Y		Y	_	Y	Y		Y		Steroid Inh	alants	Beclomethasone Dipropionate	Y		Y		Y		Y		Y	Y
	Steroid Inhalants	Budesonide	Y	_	Y		Y	_	Y	Y	_	Y		Steroid Inh	alants	Budesonide	Y		Y		Y		y		Y	Y
	Steroid Inhalants	Ciclesonide	Y		Y		Y		Y	V V	_	Y		Steroid Inh	alants	Ciclesonide	Y		Y	1.1.1	Y		y		Y	Y

Challenge Tests	Glucose 3 Hours Post 100g Glucose	1530-5	PCM Team Decision
Challenge Tests	Glucose 3 Hours Post 75g Glucose	1533-9	PCM Team Decision
Challenge Tests	Glucose 3 Hours Post Dose Glucose	20437-0	PCM Team Decision
Challenge Tests	Glucose 3 Hours Post Challenge	18342-6	PCM Team Decision
Challenge Tests	Glucose Baseline	1547-9	83%
Challenge Tests	Glucose Pre Dose Insulin IV	54257-1	83%
Clinical Category	Result Name	LOINC Code	

Medications

Search: Show 25 entries Medication Category **RxNorm Subclass** RxNorm Code % Consensus Agreement Anti-Diabetic Agents Alpha-Glucosidase 16681 100% Acarbose Inhibitors Anti-Diabetic Agents Alpha-Glucosidase miglitol 30009 100% Inhibitors Anti-Diabetic Agents **Biguanides** Metformin 6809 100%

Enabling POV

SME and UW ProMaps team content development driven by clinical guidelines Available online at <u>ProblemList.org</u>

-Diabetes Problem-Meds and Labs (above) leverage LOINC codes for labs, RxNorm codes for meds, and SNOMED CT codes for problems Freely available for global EHR and information system integration

Problem Oriented View Study

- Epic simulation environment was used to display data in two Views:
 - The Problem Oriented View (POV)
 - The Traditional View (Epic standard)
- Participants asked to answer questions using the two Views
- 3 institutions, 51 participants (internal medicine residents)
- Cases test ability to extract data from EHR, not clinical knowledge
 - E.g., "John has hypothyroidism. When was his TSH last checked?"

✓ Hypertension goal BP (blood pressure) < 150/90
 ✓ Details Chronic:

 ✓ Code: I10 Noted: 06/19/2017
 ✓ Relevant Medications

 Medication ▲

 Prescriptions
 > amLODIPine (NORVASC) 10 MG tablet
 ✓ 10 mg, Oral, Daily
 > carvedilol (COREG) 25 MG tablet
 ✓ 25 mg, Oral, BID with meals
 > hydrALAZINE (APRESOLINE) 25 MG tablet
 ✓ 50 mg, Oral, TID

🖲 Relevant Results

	Most Recent	12/19/2016
Chem Profile		
BUN, BId	56 (12/19/2016)	56
Creatinine	2.2 (A) (12/19/2016)	2.2 (A)
eGFR	29.0 (A) (12/19/2016)	29.0 (A)
Potassium	3.9 (12/19/2016)	3.9
Sodium	139 (12/19/2016)	139
Urine Chemistry		
Creatinine, Urine	103 (8/25/2015)	

Study Hypotheses

The Problem Oriented View will allow participants to complete their cases:

More Quickly	More Accurately	With Greater User	With Less Cognitive Work
	(Lower Error Rate)	Satisfaction (SUS) ¹	(NASA-TLX) ²

1. SUS = System Usability Scale, from Brooke, J. (1986). "SUS: a "quick and dirty" usability scale". In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland (eds.). Usability Evaluation in Industry. London: Taylor and Francis. https://www.usability.gov/how-to-and-tools/methods/system-usability-scale.html

2. NASA-TLX = NASA Task Load Index, from Hart, S. G. & Staveland, L. E. (1988) Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research. In P. A. Hancock and N. Meshkati (Eds.) Human Mental Workload. Amsterdam: North Holland Press. https://humansystems.arc.nasa.gov/groups/TLX/

Study Results

More Qu	ickly	More Accu (Lower Erro	urately or Rate)	With Great Satisfaction	rer User n (SUS)	With Less Cognitive Work (NASA-TLX)				
Traditional	POV	Traditional	POV	Traditional	POV	Traditional	POV			
196 sec	172 sec	7.4%	3.3%	41.8	58.0	0.96	0.72			
POV faster by 24 seconds		POV reduces of by 55%	error rate	POV more sati 16.2 points	sfying by	POV less cognitive work by 0.24 points				
				Scale 0 – 70, 70 experience	best	Scale 0.4 – 2.8, 2.8 most cognitive work				
p = 0.03		p = 0.003		p < 0.0001		p = 0.0003				

■ N = 48 participants

Semanik MG, Kleinschmidt PC, Wright A, Willett DL, Dean SM, Saleh SN, Co Z, Sampene E, Buchanan JR. Impact of a problem-oriented view on clinical data retrieval. J Am Med Inform Assoc. 2021 Apr 23;28(5):899-906. doi: 10.1093/jamia/ocaa332. PMID: 33566093; PMCID: PMC8068438.

The ProMaps Plan

- Current availability in Epic
- Continued development of most common problem maps with labs and meds
- Attain critical mass (~200+) maps, secure additional funding, have as public standard
- □ Adoption by more EHRs, for more use cases
- □ Adding radiology, procedures, etc. to maps
- Updates and maintenance of maps



See More Information at https://problemlist.org

ProMaps slides courtesy of Dr. Joel Buchanan and Dr. Michael Semanik

Laboratory Role and Value



The Laboratory Role and Value

- Clinical laboratory generates over 70% of EHR data utilized for clinical decision making!
- Reduce clinician cognitive burden and better aid clinical use of data like lab data by:
 - Clinical decision support (CDS) tools / aids
 - EHR usability/ redesign / facility customization
 - Policies for implementations


Laboratory Data Usability 1

- To be computer processable/utilized in clinical decision support like ProMaps, laboratory data need to be:
 - I. Electronic. Paper records just don't cut it!
 - Discretely Modeled. PDF/Text Blob reports are human readable, but not very computer processable
 - Think Orders-Results-Values LIS Data Builds

Laboratory Data Usability 2

- Ike LOINC for lab orders and results and SNOMED CT for qualitative result values, organisms, specimen types, specimen sources, etc.
- 4. Messaged with proper HL7 message structure and interfaces connecting systems
- 5. Maintained. With test updates, coding updates, new message functionality, etc.

Why?

- □ So computers can utilize lab data better
- PCM is dependent on LOINC codes from each performing laboratory driving their appearance in Problem Oriented View.
 - Uncoded or paper results won't appear
 - Important information could be missed from your laboratory
 - It's no longer enough to just report results, they need to be usable!

Why?

Huge physician complaint is unusable results \rightarrow Adds to their burden Encoding and structuring lab data at point of origin reduces manual mapping that may be needed out of the laboratory, and allows data to flow to downstream systems reducing potential for errors to be introduced later (a patient safety and data quality issue)

Clinical Decision Support LOINC Considerations



CDS LOINC Considerations

- PCM is example of Clinical Decision Support (CDS) Tool Using LOINC
- Understand Use Cases and ensure LOINC mapping usage is "Fit for Purpose"
 - Maps to LOINC and LOINC Map Quality / Appropriateness
 - LOINC Subsets (Clinical, Lab, Document Ontology, Radiology, etc.)
 - US versus International Use
 - LOINC Status / Use
 - Generic LOINCs / Context

LOINC Mapping and Maintenance

- Clinical Decision Support Projects using LOINC (like ours) need to:
 - Ensure items are mapped to LOINC (or queries won't return results)
 - Ensure items are mapped appropriately to LOINC (or queries may return unintended results)
- Mappers make sure LOINC is updated within 90 days of each release
- Also vital for 21st Century Cures Act and Federal Interoperability Implementations
 FHIR Apps, Information Blocking, etc.

LOINC Considerations US vs Intl

- US vs International Usage
 - Units may or may not differ mmol/L
 - Rankings as rough indicator
 - Community Maps as rough indicator
 - Clinical Experience
 - All inform Usage. Feedback welcome
- Countries with own LOINC subsets
- Countries not using LOINC



LOINC Statuses

- Deprecated, Discouraged or Trial
- We include Deprecated and Discouraged, even though Best Practice is not to map to them
- Our use case retrieves historic lab results which may be mapped to LOINCs now discouraged or deprecated

Physician and Lab Perspectives

- Physician has "test" in mind
- Each laboratory has one or more "kinds of tests"
 - Different methods or specimens used in various settings (i.e. inpatient, outpatient, point of care)
 - Reference lab may not perform POCT, critical care testing (i.e. blood gases)
 - Orders, reflex tests with many results
- We present to physician different ways "test" can be performed.
- □ Most patients only have a few kinds of "tests"

Generic LOINCs

- Generic LOINCs are non specific for specific method or analyte
 - Interpretations
 - Coagulation Biomarker Panel vs. Genetic Marker Results vs Pathology Report
- CDS Queries with generic LOINCs often need additional information in query to have appropriate context
 - If Coag CDS, want to include Coag genetic and biomarkers, but exclude pathology, other genetic and biomarkers, prenatal, electrophoresis interpretations, etc.

Cultures and Reflex Tests

Antimicrobial Sensitivity LOINCs used in context of organism(s) cultured, body site and other details

If Methicillin LOINC queried, are all organisms and specimens desired or only resistant values, or urine specimens, indicating urinary tract infections (UTIs)?

For Reflex Testing, is the final result desired or all results in cascade?

Communications



Department of Medicine UNIVERSITY OF WISCONSIN

SCHOOL OF MEDICINE AND PUBLIC HEALTH

Getting Out of the Lab I

Being the face of the laboratory Volunteering for hospital/clinical committees Picnic, cafeteria, coffee etc. Projects with laboratory data Clinical informatics projects Education and Outreach programs

Getting Out of the Lab II

Connecting with clinical colleagues
 What are their lab challenges?
 How do they use laboratory data?
 Differences in Outpatient vs Inpatient?
 Patient population differences

Lab Data Usability Issues

 Some LISes don't support sensitivity orders in OBR 4 (order) part of message so can't be sent to public health

In Micro and Transfusion lack of maps.

- How do you help physicians with usability of lab data.
- Perhaps radiology creat pjt to get more throughput and revenue.
- Most common physician problems?

Your Trusted Lab Resource

Make friends. You can be their trusted lab resource and they can be yours in nursing, radiology, nutrition, etc.

□ Be seen as a peer health professional

Questions and Answers

Thank you for your attention!

Contact Information:

Andrea Pitkus pitkus@wisc.edu



Department of Medicine UNIVERSITY OF WISCONSIN SCHOOL OF MEDICINE AND PUBLIC HEALTH

Break

WISCONSIN STATE LABORATORY OF HYGIENE - UNIVERSITY OF WISCONSIN



Highlighting the Gold Medal Winners



WISCONSIN STATE LABORATORY OF HYGIENE - UNIVERSITY OF WISCONSIN



Highlighting the Gold Medal Winners

Review of WCLN Surveillance

Allen Bateman, PhD, MPH, D(ABMM)

Director, Communicable Disease Division Wisconsin State Laboratory of Hygiene



6 October 2021





Your participation in the Wisconsin surveillance system is **vital** to monitor infectious diseases of public health importance

Outline

- SARS-CoV-2
- Impact of SARS-CoV-2
 - Specimen numbers at WSLH
 - TB
 - Enteric bacteria
 - Norovirus
 - Rabies
 - Other respiratory diseases
- WSLH surveillance tables

SARS-CoV-2 Surveillance

U.S. trends Last 90 days All time New reported cases by day Hospitalizations 7-day average 7-day average 200,000 cases 100,000 hospitalized 100,000 50,000 Feb. 2021 Feb. 2020 Feb. 2021 Feb. 2020 Óct. Oct. Jun. Jun. Oct. Jun. Jun. Oct.

Tests by day

New reported deaths by day



https://www.nytimes.com/interactive/2021/us/covid-cases.html



SARS-CoV-2 Surveillance in Wisconsin



https://www.dhs.wisconsin.gov/covid-19/data.htm

SARS-CoV-2 Genomic Surveillance

	1														
	**	**	_	_	_	_	_	_	_	_	_	_	_	_	100%
															10070
WHO label															90%
Alpha															0.044
Beta															80%
Gamma														7.2	70%
Delta													7.2	3.1.61	
											N	172	.1.61		60%
	7.2	7.2	7.2	7.2	12	7.2	7.2	7.2	17.2	317.2	617.	8.1.61			
lota	1.61	.1.61	.1.61	.1.61	1.61	.1.61	3.1.61	.1.61	8.1.6	B.1.6	B.1				50%
Карра				8	8	-									1001
Mu															40%
N/A														5	30%
,														B.1.1	
Other													11.7		20%
												_	8		
* Enume one HHS re														P.1	10%
the aggrega weeks displ															0%
** These projections	/21	/21	/21	/21	/21	/21	/21	/21	/21	/21	/21	21	/21	/21	
dates	25	18	11	9/4	28	21	14	5	31	24	11	10)	3	26	

United States: 6/20/2021 - 9/25/2021

United States: 9/19/2021 - 9/25/2021 NOWCAST

LISA

038						
WHO label	Lineage #	US Class	%Total	95%PI		
Alpha	B.1.1.7	VBM	0.0%	0.0-0.2%		
Beta	B.1.351	VBM	0.0%	0.0-0.2%		
Gamma	P.1	VBM	0.0%	0.0-0.2%		
Delta	B.1.617.2	VOC	99.0%	97.9-99.8%		
	AY.1	VOC	0.1%	0.0-0.5%		
	AY.2	VOC	0.0%	0.0-0.2%		
lota	B.1.526	VBM	0.0%	0.0-0.2%		
Карра	B.1.617.1	VBM	0.0%	0.0-0.2%		
Mu	B.1.621	VBM	0.0%	0.0-0.2%		
N/A	B.1.628		0.0%	0.0-0.2%		
	B.1.637		0.0%	0.0-0.2%		
Other	Other*		0.9%	0.0-1.9%		

* Enumerated lineages are VOI/VOC or are circulating >1% in at least one HHS region during at least one two week period. "Other" represents the aggregation of lineages which are circulating <1% nationally during all weeks displayed.

** These data include Nowcast estimates, which are modeled projections that may differ from weighted estimates generated at later dates

https://covid.cdc.gov/covid-data-tracker/#variant-proportions

SARS-CoV-2 Genomic Surveillance in Wisconsin



Number of sequences by selected time period of sample collection.

https://dataportal.slh.wisc.edu/sc2dashboard#tab-2341-2

SARS-CoV-2 Genomic Surveillance in Wisconsin



Proportion of sequenced strains that are variants, over time by sample collection date.

https://dataportal.slh.wisc.edu/sc2dashboard#tab-2341-2



December 22, 2020 - 3:56 PM ET

MICHAELEEN DOUCLEFF

What We Know About The New U.K. Variant Of Coronavirus — And What We Need To Find Out

• December 2020: B.1.1.7 in the U.K.



https://www.npr.org/sections/goatsandsoda/2020/12/22/948961575/what-we-know-about-the-new-u-k-variant-of-coronavirus-and-what-we-need-to-find-o



SARS-CoV-2 WGS approach in Wisconsin

- Participate in CDC's NS3 program
- Overall approach: general and targeted
 - General
 - WSLH sequencing all PCR positives from diagnostic testing at WSLH
 - Request positives from clinical labs statewide
 - Selected clinical labs initially; then broadened to all labs
 - Targeted
 - WI DHS Department of health criteria to enrich for variant identification sent to WSLH: positive samples from individuals with
 - International travel
 - Vaccine failure
 - Prolonged infections
 - Suspected re-infections



COVID-19 Health Alert # 25:

Surveillance for New Genetic Variants of SARS-CoV-2: Information for Clinicians

Bureau of Communicable Diseases, January 4, 2021



• June/early July 2021: request all positives





- August 2021: 10 per lab per week
- Now: 5 per lab per week





- 4 other labs in Wisconsin also sequencing
 - City of Milwaukee Health Department Laboratory
 - Marshfield Clinic Research Institute
 - UW-Madison AIDS Vaccine Research Laboratory
 - Medical College of Wisconsin

Thanks for your partnership in genomic surveillance!

Wisconsin Sta Laboratory of UNIVERSITY OF VISCO 2601 Agriculture Dr, Mad	Errin C. Rider, Director of Clin CDD Customer FAX: 844-390 kits and Suppli	Ph.D., D(ABMM),M(ASCP)CM cal Laboratory Services Service 2-1013 2033 es: 800-862-1088	SARS-CoV-2 Ver. 1/2021			
(Please type or print	using black pen)					
Patient Information	l					
Ivanie (Lasi, Filsi).						
Address:						
City:	State: Zip:	Account: 74200	Account: 74200			
Date of Birth:	Gender: M	F				
Ethnicity Race Hispanic/Latino Ame NonHispanic Asia	g Indian 🗆 Black/African Amer. 🗆 n 🗆 Pacific Islander	Clinician: White Other				
Your Patient ID Number:		Your Specimen ID Number:				
Collected:	Nasopharynx Swab Anterior Nares (Nasa Combined Throat/Na Throat Swab	□ BAL d) Swab □ Sputum isopharynx Swab □ Other				
☐ VR01760 SARS	-CoV 2 PCR (must mee -CoV-2 Sequencing) mu	t WDPH criteria) 1st meet WDPH criteria OR be reque	sted for surveillance)			
SARS-CoV-2 PCR	(check all that apply)	SARS-CoV-2 Sequer	ncing			
Pregnant: Employed in a healthca Has symptom related to If symptomatic Staff in a congregate cc Resident in a congrega Patient was hoapitalized	are setting: [o COVID-19: [c, date of onset: are setting: [because of this condition: [odwitted the ICU:	Yes □ No • Only for previous! Yes □ No • Results are for sur be reported to sub Yes □ No • Optimal volume 1 Yes □ No • Optimal volume 1	ly PCR positive specimens veillance only and will not mitters mL			
If hospitalized	, admitted to 100.					
If hospitalized,	8					
If hospitalized, Postmortem: Yes Vaccination History International Trave	s (COVID): <u>Was patient</u> If Yes, da l History (Places and da	Xaccinated? Yes No Unk te first vaccinated: / / (tes):	nown			
If hospitalized, Postmortem: Ye: Vaccination History International Trave	s (COVID): <u>Was patient</u> If Yes, da l History (Places and da WISCONSIN STATE L	vaccinated? Yes No Unk te first vaccinated: / / ites): ABORATORY OF HYGIENE US	nown E ONLY			

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- SARS-CoV-2
- Impact of SARS-CoV-2
 - Specimen numbers at WSLH
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 - Enteric bacteria
 - Rabies
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- WSLH surveillance tables



Specimen numbers at WSLH - 2020




18000 16000 14000 12000 10000 8000 6000 4000 2000 0 Feb Jan Mar Apr May Jun Jul Aug Sep Oct Nov Dec



18000

16000												
14000												
12000												
10000												
8000			*									
6000					-							
4000		\checkmark										
2000												
0	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Myco	obacteriol	ogy 🗕	Bacterio	ology 🛁	-Virolog	gy ——	STDs	Serol	logy	











Mycobacteriology Testing Volume





TB Cases in Wisconsin, 2011-2021 (YTD)

Year	No.	Rate*		
2011	70	1.2		
2012	71	0.87		
2013	50	0.87		
2014	48	0.83		
2015	69	1.2		
2016	40	0.69		
2017	49	0.84		
2018	49	0.84		
2019	51	0.87		
2020	35	0.59		
2021 (YTD)	43	0.74		

*People with TB per 100,000 (2.7 nationwide average)



Decreased Rates of Infection with Pathogens Transmitted Commonly Through Food During the COVID-19 Pandemic — Foodborne Diseases Active Surveillance Network, 10 U.S. Sites, 2017–2020

https://www.cdc.gov/mmwr/volumes/70/wr/mm7038a4.htm?s_cid=mm7038a4_w_

National Center for Emerging and Zoonotic Infectious Diseases



Foodborne Diseases Active Surveillance Network

MMWR Report Incidence Estimates for 2020











Fewer infections reported every month beginning in March



Infections linked to international travel decreased markedly



Factors related to the COVID-19 pandemic likely contributed to decreases in incidence of enteric infections



As usual, Campylobacter and Salmonella led in number of infections



As usual, *Listeria* had the largest percentage of ill persons hospitalized

95%



Incidence rates decreased for most pathogens

	2020	Compared with 2017–2019			
Pathogen	Incidence Rate	% Change	(95% CI)		
Campylobacter	14.4	-23%	(-29% to -16%)		
Salmonella	13.3	-22%	(-29% to -17%)		
Shiga toxin-producing <i>E. coli</i> (STEC)	3.6	-37%	(-47% to -26%)		
Shigella	3.1	-41%	(-54% to -23%)		
Yersinia	0.9	-10%	(-29% to +14%)		
Vibrio	0.7	-25%	(-39% to -8%)		
Listeria	0.2	-27%	(-43% to -7%)		
Cyclospora	0.6	-17%	(-50% to +37%)		

Purple shading shows statistically significant declines

Similar proportion of bacterial infections detected by CIDT only compared with previous 3 years





for some pathogens

Incidence of Salmonella infection

Decreased for some serotypes

Unknown factors

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				k.	I 4,[5],12:i:-	Typhimurium	
∽_	Campylobacter	Listeria	STEC	~~	Enteritidis	Javiana	
	Salmonella S	Shigella V	/ibrio				
				→	Newport	Infantis	
→	Cyclospora	Yersini	a				
				~~~	Hadar increased		
Laboratory factors Not responsible for decreased incidence				Influ	COVID-19 pa uenced exposure	andemic and detection	
→ % of infections diagnosed by CIDTs was stable				Public health measures			
<b>M</b> .	% of CIDT-positive	specimens		Ĩ	Changes in healtl	ncare delivery	
<b>Y</b>	with renex culture	ueciedseu					

48



### Rabies











https://www.cdc.gov/flu/weekly/index.htm

### Early in 2021-2022 season...



https://www.cdc.gov/flu/weekly/index.htm



#### WHO Global Influenza Surveillance and Response System (GISRS)

#### Southern hemisphere, 2020



#### Southern hemisphere, 2021

Number of specimens positive for influenza by subtype



#### https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Southern



#### WHO Global Influenza Surveillance and Response System (GISRS)

Northern hemishere





Mask wearing, social distancing and other steps to stop COVID-19 have also curtailed influenza

By Katie Peek on April 29, 2021

https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Northern

WHO Global Influenza Surveillance and Response System (GISRS)

#### Northern hemisphere, 2021

Number of specimens positive for influenza by subtype

1000



#### https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Northern

Human seasonal influenza under COVID-19 and the potential consequences of influenza lineage elimination

Vijaykrishna Dhanasekaran,^{1,2*} Sheena Sullivan,³ Kimberly M. Edwards,^{1,2} Ruopeng Xie,^{1,2} Arseniy Khvorov,³ Sophie A. Valkenburg,^{1,2} Benjamin J. Cowling,¹ Ian G. Barr³



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## COMMENT

#### Check for updates

## Influenza lineage extinction during the COVID-19 pandemic?

Marios Koutsakos $\mathbb{D}^{1}$ ^{$\square$}, Adam K. Wheatley $\mathbb{D}^{1}$ , Karen Laurie², Stephen J. Kent $\mathbb{D}^{1,3}$  and Steve Rockman^{1,2}

The SARS-CoV-2 pandemic has seen a notable global reduction in influenza cases of both influenza A and B viruses. In particular, the B/Yamagata lineage has not been isolated from April 2020 to August 2021, suggesting that this influenza lineage may have become extinct, which may provide opportunities for improving availability and effectiveness of influenza vaccines.

### **Other Respiratory Diseases: RSV**

Respiratory Virus Activity, Wisconsin October 2020 to Present





#### Percent Positive RSV, 2019-2021



#### RSV Positive Cases, PCR July to Mid-September 2019-2021

2019	2020	2021
9	11	3771

#### **Other Respiratory Diseases**

Respiratory Virus Activity, Wisconsin October 2020 to Present



#### Aggregate data from Wisconsin Clinical Laboratories

- All clinical labs in Wisconsin
- Weekly data: number of specimens tested, and number positive for each respiratory virus
- Advantage: large numbers (500-1000/week)



#### Aggregate data from Wisconsin Clinical Laboratories



Centers for Disease Control and Prevention CDC 24/7: Saving Lives, Protecting People™

Map of Participating Labs

#### The National Respiratory and Enteric Virus Surveillance System (NREVSS)



### Acute Flaccid Myelitis (AFM)

Confirmed AFM cases by CDC



Month of onset

### Circulation of influenza, RSV, and SARS-CoV-2: an uncertain **W Q season ahead**

"We could get RSV, influenza, and SARS-CoV-2 circulating at the same time, and we just do not know how that is going to play out"



Published Online August 6, 2021 https://doi.org/10.1016/ S2213-2600(21)00364-7

For the Academy of Medical Sciences report see https:// acmedsci.ac.uk/filedownload/4747802
## Outline

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  - Other respiratory diseases
- WSLH surveillance tables



### Laboratory-based Surveillance Plan

- Detailed instructions
- Description of surveillance requests
- Web-based reporting instructions



#### Laboratory-Based Surveillance Plan 2021-2022



Information, Forms and Instructions



Wisconsin State Laboratory of Hygiene Laboratory-based Surveillance Plans, Wisconsin, 2021-2022

Respiratory Pathogen	Testing Data requested	Frequency to Report	Confirmatory testing available at WSLH
	Rapid Testin	g/Antigen Dete	ction
Influenza A/B	Number detected and number tested	Weekly	<ol> <li><u>ALL</u> summer positives</li> <li>During respiratory virus season, limited to first confirmed A or B positive at WSLH</li> <li>Additionally, please send positive specimens from patients with:         <ol> <li>International travel history</li> <li>Swine exposure</li> </ol> </li> </ol>
Rotavirus	ł		Send one positive/week
SARS-COV-2	+		No (please contact WSLH for
RSV Strep (rapid tests only)	+		approval)
		PCR	
Influenza A/B	Number detected and number tested	Weekly	<ul> <li>ONLY send the following specimens:</li> <li>1. Unable to subtype (InfA Ct&lt;35.0) if subtyping was attempted</li> <li>2. One hospitalized patient per week</li> <li>3. Patients with international travel history</li> <li>4. Patients with swine exposure</li> </ul>
SARS-CoV-2 and Non- influenza respiratory pathogens (e.g. RSV) <i>B. pertussis</i> Other viruses (e.g., VZV)	-		No
Enterovirus*	Number detected & number tested	Weekly	Yes*

* Enterovirus typing may be performed on CSF specimens related to clusters of severe disease, acute flaccid myletis (AFM), paralysis, death or those requested by the Wisconsin Division of Public Health (WDPH).

Table 1

Pathogen	Testing Data to Report	Frequency to Report	Send specimens to WSLH
Gas	tropathogen	s (PCR or o	other CIDT)
Aeromonas species			Isolates or stool for identification
Campylobacter species			Isolates or stool for identification; Antimicrobial susceptibility testing and molecular subtyping (WGS) will be performed as necessary
Enterohemorrhagic/ Shiga Toxin-Producing <i>E. coli</i> (EHEC/STEC)			Isolates, stool or enrichment broth for identification, serotyping and molecular subtyping (WGS)
Plesiomonas shigelloides			Isolates or stool for identification
Salmonella species	Number detected and number tested	Weekly	Isolates or stool for identification, antimicrobial susceptibility testing and molecular subtyping (WGS)
Shigella species and Enteroinvasive E.coli (EIEC)			Isolates or stool for identification and antimicrobial susceptibility testing; Molecular subtyping will be performed as deemed necessary



Pathogen	Testing Data to Report	Frequency	Send specimens to WSLH
Gast	tropathogen	s (PCR or o	ther CIDT)
Vibrio Species			Isolates or stool for identification and referral to CDC
Yersinia species			Isolates or stool for identification
<i>Cryptosporidium</i> species	-		Stool for identification* and genotyping
Cyclospora cayetanensis			Stool for molecular subtyping and/or referral to CDC
Rotavirus	Number detected	Weekly	One positive per week for molecular subtyping/genotyping
Any other organism suspected of being in a cluster or outbreak of public health significance	and number tested		Consult with Wisconsin Division of Public Health Foodborne Disease Epidemiologists; isolates or stool for identification and molecular subtyping as applicable
Clostridioides difficile			WSLH does not request submission of this organism at this time
Norovirus			WSLH does not request routine submission of this organism at this time unless specifically requested by the WDPH or WSLH





Pathogen	Testing Data to Report	Frequency	Send specimens to WSLH
Gast	tropathogen	s (PCR or o	other CIDT)
Astrovirus			WSLH does not request submission of this organism a this time
Sapovirus	•		WSLH does not request submission of this organism a this time
Adenovirus F (40/41)	Number		WSLH does not request submission of this organism a this time
Enteropathogenic, Enteroaggretative and Enterotoxigenic <i>E. coli</i> (EPEC, EAEC and ETEC)	detected and number tested	Weekly	WSLH does not request submission of these organism at this time
Giardia species			WSLH does not request submission of this organism a this time
Entamoeba histolytica			WSLH does not request submission of this organism a this time unless specifically requested by the WDPH.

Pathogen	Specimens Requested	Frequency	Confirmatory testing available at WSLH
,	Antimicrobia	al Resistanc	ce (AR)
Pan-resistant organisms (R to all drugs tested in your laboratory)			Identification, antimicrobial susceptibility testing, AR-targeted PCR and referral to CDC as necessary
Candida auris, C. haemulonii, invasive C. glabrata and unusual* and hard to ID Candida			Identification, antimicrobial susceptibility testing and referral to CDC as necessary
Enterobacteriaceae resistant to carbapenems	AST results and	As detected	Identification, antimicrobial susceptibility testing, carbapenemase screen, AR- targeted PCR and referral to CDC as necessary
Staphylococcus aureus (I or R to Vancomycin)	any phenotypic or molecular targets detected		Identification, antimicrobial susceptibility testing and referral to CDC as necessary
Enterococcus** with elevated MIC's to Vancomycin (≥32 µg/ml), Daptomycin (≥8µg/ml), Linezolid (≥8µg/ml)	submitted with isolate		Identification, antimicrobial susceptibility testing and referral to CDC as necessary
Pseudomonas aeruginosa (Resistant to carbapenems other than ertapenem and non-susceptible to cefepime and/or ceftazadime)		Up to 5 isolates per month	Identification, antimicrobial susceptibility testing, carbapenemase screen, AR- targeted PCR and referral to CDC as necessary
[†] Acinetobacter baumanii (Resistant to carbapenems)		As detected	Identification, antimicrobial susceptibility testing, AR-targeted PCR and referral to CDC as necessary
Aspergillus fumigatus isolates from invasive infections			Isolates will be forwarded to the Maryland Department of Health for surveillance of azole resistance.

Pathogen	Frequency to Send	Send Specimens to WSLH for Characterization	
Invasive Bacteria (Blood, CSF or other sterile body site)			
Haemophilus influenzae	As detected	Isolates or CSF for identification and serotyping	
Listeria monocytogenes		Isolates for identification and molecular subtyping (WGS)	
Neisseria meningitidis		Isolates or CSF for identification, antimicrobial susceptibility testing and serogrouping	
Streptococcus pneumoniae		Isolates or CSF for identification, antimicrobial susceptibility testing and serotyping *serotyping performed upon request on: • CSF isolates • Isolates non-susceptible to clinically relevant drugs • Possible failure of therapy or vaccine or outbreak related isolates	
Any other organisms suspected of being in a cluster or outbreak of public health significance		Consult with Wisconsin Division of Public Health Epidemiologists; Isolates for identification and molecular subtyping	
Gram negative isolates from sterile body sites that are unidentifiable using commercial systems		Sequenced based and phenotypic identification will be performed	



THANK

Your participation in the Wisconsin surveillance system is **vital** to monitor for emerging novel strains with pandemic potential and other pathogens that impact community health.

## **Medal for the Every Day Olympian**



WISCONSIN STATE LABORATORY OF HYGIENE - UNIVERSITY OF WISCONSIN

## **Peter A. Shult Award**

- The Peter A. Shult Award is being established in 2022 at the suggestion of the WCLN Laboratory Technical Advisory Group (LabTAG).
- The Peter A. Shult Award will be awarded annually by the WSLH to recognize an exceptional clinical laboratory professional.
- The award is named in honor of Dr. Shult's vision of and contributions to the development of the WCLN in 2003 and his active support in maintaining and strengthening the WCLN until his retirement in 2021.





## **Peter A. Shult Award**

#### **Attributes:**

- This award is for a laboratory professional at any stage of their career or educational degree attainment who is employed in a Wisconsin Clinical Laboratory Network (WCLN) member clinical laboratory.
- This individual actively participates in the WCLN
- This individual has made outstanding contributions to promoting the field of clinical laboratory science and/or has demonstrated exceptional clinical laboratory science service within their own facility, health system, or within the WCLN.



## **Peter A. Shult Award**

#### **Nominations:**

- Nomination forms and detailed instructions will be posted on our WCLN web page early in 2022.
- Reminders to nominate an individual will be included in Wisconsin Laboratory messaging.
- Completed nominations must be submitted by March 1, 2022 to be considered.
- LabTAG will review all nominations and determine the awardee.
- All nominees will be recognized and the award will be presented at the spring technical meeting in 2022.



## Thank You !

### **Laboratory Technical Advisory Group**

- Tyler Tschanz Mayo Clinic Health System Eau Claire Hospital, Eau Claire (Region 1)
- Becky Brooks Ascension St. Michael Hospital, Stevens Point (Region 2)
- Tyler Radke Bellin Health, Green Bay (Region 3)
- Jorn Bansberg- Vernon Memorial Hospital, Viroqua (Region 4)
- Heather Alvarez Columbus Community Hospital, Columbus (Region 5)
- Katie Fuchs- Ascension St. Elizabeth Hospital, Appleton (Region 6)
- Tim Block Froedtert St. Joseph's Hospital, West Bend (Region 7)
- Eric Beck-ACL Laboratories, West Allis (At large member)
- Erik Munson Marquette University, Milwaukee (At large member)
- Raymond Podzorski St. Mary's Hospital, Madison (At large member)



# Thank You !

### 2021 WCLN Regional Meeting Speakers

- Erik Munson
- Alana Sterkel
- Robert Leschke
- Andrea Pitkus
- Allen Bateman

### 2021 WCLN Regional Meeting Panelists

- Anna Kocharian
- Jessie Phalen
- Anna Marciniak
- Nikki Mueller
- Heather Alvarez
- Tyler Tschanz
- Jorn Bansberg
- Eric Beck
- Tim Block
- Becky Brooks



## **Thank You !**

### **2021 WCLN Regional Meeting Technical Support Team**

- Jim Hermanson
- Susan Schmidt
- Laura Louison

WISCONSIN STATE LABORATORY OF HYGIENE - UNIVERSITY OF WISCONSIN



## Closing Ceremonies Thank you all of you in attendance today both in person and virtual! Your presence and participation today are what made this meeting a success. You are true gold medal Olympians!



## The Games Have Concluded

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