

Measles Community Response: Preparing Your Office and Hospital

A multidisciplinary panel of experts from:









Today's Speakers

Seattle Children's

- **Danielle Zerr, MD**, **MPH** Division Head, Infectious Diseases; Medical Director Infection Prevention
- Thérèse "Tee" Mirisola, MSN, RN, CIC, Director, Infection Prevention
- Adrienne D'Alo, PMP, Special Pathogens Program Manager
- Brianna Enriquez, MD, Medical Director, Emergency Management

Allegro Pediatrics

• Amy Carter, MD, FAAP, Chief Medical Officer

Public Health – Seattle & King County

- Eileen Benoliel, RN, BSN, Vaccine Preventable Disease Program Manager
- Libby Page, MPH, Immunization Program Manager



Additional Panelists

Seattle Children's

- Caitlin McGrath, MD, MS, Associate Medical Director, Infection Prevention
- Yasaman Fatemi, MD, MSHP, Associate Medical Director, Infection Prevention

Northwest Healthcare Response Network

• Vicki Sakata, MD, FAAEM, FAAP, Senior Medical Advisor



Seattle Children's Infection Prevention Perspective

Danielle Zerr, MD, MPH Division Head, Infectious Diseases; Medical Director, Infection Prevention Thérèse "Tee" Mirisola, MSN, RN, CIC, Director, Infection Prevention Adrienne D'Alo, PMP, Special Pathogens Program Manager



Case

- Jan-Feb 2025: Infant travels internationally to a country with endemic measles
- Feb. 25 2025:
 - Presents to Children's (SCH) with signs and symptoms of measles
 - Testing obtained and ultimately positive for measles
- SCH and PH identified multiple exposure points most during period with nonspecific symptoms

Date	Time	Location
2/20/25	6:00 pm- 9:00 pm	Apple Store at Bellevue Square 213 Bellevue Square, Bellevue, WA 98004
2/21/25 – 2/22/25	10:30 pm – 2:15 am	Seattle Children's Hospital Emergency Department 4800 Sand Point Way NE, Seattle, WA 98105
2/24/25	1:00 pm – 4:15 pm	Allegro Pediatrics – Bothell 11724 NE 195 th St, Ste 100, Bothell, WA 98011
2/25/25	1:00 pm – 4:00 pm	Northwest Asthma & Allergy Center 8301 161 st Ave NE, Ste 308, Redmond, WA 98052
2/25/25	2:30 pm – 5:30 pm	Seattle Children's Hospital Emergency Department 4800 Sand Point Way NE, Seattle, WA 98105

• Hundreds exposed. To date: 5 symptomatic children tested with negative results



Key Features of Measles Epidemiology

- Highly transmissible: R0 12–18
- Incubation period:
 - Avg. 11-12 days from exposure to onset of prodromal symptoms
 - Avg. 14 days (range 7-21) exposure to rash
- Contagion period
 - 4 days prior to rash through 4th day of rash
- Symptoms:
 - Non-specific prodrome: fever, conjunctivitis, coryza, cough (3C's)
 - Rash





Outcomes (Why We Worry)

- Common complications
 - Otitis media, pneumonia, diarrhea
- Severe complications
 - Encephalitis: 1 of every 1,000 measles cases (often w/ permanent brain damage)
 - Mortality: 1-3 of every 1,000 children will die
 - <u>Subacute sclerosing panencephalitis (SSPE)</u>:
 - Rare, fatal degenerative brain disease
 - Generally develops 7 to 10 years after measles infection.
- People at high risk for complications:
 - Infants and children aged <5 years
 - Adults aged >20 years
 - Pregnant people
 - People with compromised immune systems (leukemia, HIV infection, etc.)





Preventing Exposures at Children's Locations

- When there is a local case or a large outbreak somewhere else:
 - Use Public Health notices as a trigger
 - Content on public-facing website
 - Erect signs at all entrances
 - +/- Screener at ED entrance
- If we have a large local exposure or local transmission
 - All of the above
 - Screener at the ED entrance



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We have a case; Now what?

- Contact Tracing (exposed: shared air space + 2hrs after index case leaves)
 - Notify Occupational Health to confirm staff immunity
 - Patient line list with age, immunity, immunocompromised?
 - 28/54 exposed patients at SCH were up-to-date on MMR vaccine
 - 5 received secondary testing at SCH
- Flag EHR with isolation status
 - Isolate anyone without two vaccinations starting day 5
- Notify all families and give instructions specific to immune status
 - Encourage families to utilize their PCP as primary contact for follow-up questions





Post-Exposure Prophylaxis (aka PEP)

- Planning for PEP:
 - Work with pharmacy & sourcing to validate supplies
 - Work with operations to plan for staff and space for administration
 - MMR to be given by 72 hours post-exposure
 - IM/IVIG to be given by 6 days post-exposure
- Administer PEP:
 - Strategy:
 - Maintain ED capacity by utilizing UC and PCP office when possible
 - Optimize efficiency through nurse-initiated standing orders for MMR and IMIG
 - Location of PEP administration at SCH:
 - MMR Vaccine: any Seattle Children's Urgent Care (primarily rely on PCP office for MMR)
 - IMIG: Seattle Children's Urgent Care Main Campus
 - IVIG: Seattle Children's Emergency Department



PEP: Not Immunocompromised



Red

READ ALL THE FOOTNOTES!!

PEP: Pregnant or Immunocompromised



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Category	Measles Immune	PEP Type Depending on Time After Initial Exposure				
	Status	≤3 days (≤72 hours)	4–6 days	>6 days		
Severely immunocompromi sed ^b	IG recommended regardless of measles immune status	 Administer immune globulin intravenous (IGIV)^c Home quarantine^d 		PEP not ind (too late)Home quara	icated antine ^d	
Pregnant Immune •PE		•PEP not indicated				
	Nonimmune	•Administer IGIV ^c •Home quarantine ^d		•PEP not ind (too late) •Home quara	icated antine ^d	

WA DOH

Measles Post-Exposure Prophylaxis (PEP) for Non-Symptomatic Susceptible Contacts



Recommended Dose and Timing of Measles PEP

Risk Factor	Time from First Exposure ¹			
	<72 hours	72 hours through day 6		
Infant less than 6 months old	Give intramuscular IG ² (IGIM): 0.5 mL/kg ³	Give IGIM: 0.5 mL/kg ³		
Infant age 6 through 11 months	Give IGIM ² : 0.5 mL/kg ³ or Give MMR ¹ vaccine	Give IGIM ² : 0.5 mL/kg ³		
Susceptible ⁴ pregnant woman	Give intravenous IG ² (IGIV): 400 mg/kg	Give IGIV ² : 400 mg/kg		
Severely immunocompromised ⁵	Give IGIV ² : 400 mg/kg	Give IGIV ² : 400 mg/kg		
Susceptible close contact over 1 year old ⁶	Give MMR ² vaccine if no contraindications	Can consider giving IGIM ² : 0.5 mL/kg ³ to those <66 pounds		

READ ALL THE FOOTNOTES!!

How SCH and Allegro Pediatrics Partnered to Manage Patients Exposed at Allegro

• Allegro:

- Provided line list with names, DOB, caregivers' names and numbers.
- Referred to Seattle Children's for IGIM
- Provided MMR for PEP
- SC:
 - Provided IGIM in our UC
 - No patients required IVIG
 - Provided a site for testing symptomatic patients





Testing for Measles

- ED best setting for testing safely (negative airflow rooms)
- Provider's actions:
 - Call ahead to ED to inform that the patient needs testing/assessment and to plan for arrival
 - Call Transfer Center at 206-987-8899
 - Give patient instructions on how to avoid exposures
- In the ED:
 - Automatic IP page when measles test is ordered
 - PH must be involved to approve testing at DOH





✓ Consider measles in the differential diagnosis of patients with fever and rash:

		Yes	No	Comments
A)	What is the highest temperature recorded?		٩F	Fever onset date:///
B)	Does the rash have any of the following			Rash onset date://
	Was the rash preceded by one of the symptoms listed in (C) by 2-4 days?			Measles rashes are red, maculopapular rashes that may
	Did fever overlap rash?			become confluent – they typically start at bairline, then face, and
	Did rash start on head or face?			spreads rapidly down body.
C)	Does the patient have any of the following?			Rash onset typically occurs 2-4 days
	Cough			after first symptoms of fever (≥101°F)
	Runny nose (coryza)			and one or more of the 3 Cs (cough, conjunctivitie, or convra)
	Red eyes (conjunctivitis)			conjunctions, or conjunction
D)	Unimmunized or unknown immune status?			Dates of measles vaccine: #1// #2//
E)	Exposure to a known measles case?			Date and place of exposure:
F)	Travel, visit to health care facility, or other known high-risk exposure in past 21 days?			See local health department for potential exposure sites.

- Measles should be highly suspected if you answered YES to at least one item in B and C, PLUS a YES in D or E or F. IMMEDIATELY:
 - Mask and isolate the patient (in negative air pressure room when possible) AND
 - Call your local health department to arrange testing at the WA State Public Health Laboratories (WAPHL). All health care providers must receive approval from [name of local health jurisdiction] prior to submission.
 - o [LHJ phone number] during normal business hours
 - [after hours phone number] after hours (duty officer)
- Collect specimens: see algorithm for specimen collection timing according to rash onset
 - Preferred: Nasopharyngeal (NP) or throat swab for rubeola PCR and culture
 - Most accurate day 0 5 after rash onset
 - Urine for measles PCR and culture
 - O Urine PCR test is most sensitive between ≥72 hours and 10 days after rash onset and may not be positive until >4 days after symptom onset

Acceptable: Serum for measles IgM and IgG testing

- IgM is most accurate greater than 72 hours after rash onset
- NOTE: neither IgM nor IgG antibody responses can distinguish measles disease from the response to vaccination in a patient with suspected measles that has been vaccinated 6–45 days prior to blood collection.

If you have questions about this assessment or collection and transport of specimens, call your local

Who to test?

• WA DOH Tool for Assessing for Measles Testing

Report all SUSPECT measles cases immediately to your local health department.

www.doh.wa.gov/ForPublicHealthandHealthcareProviders/NotifiableConditions/Measles

Consider measles in the differential diagnosis of patients with fever and rash:

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 - NOTE: neither IgM nor IgG antibody responses can distinguish measles disease from the response to vaccination in a patient with suspected measles that has been vaccinated 6–45 days prior to blood collection.

If you have questions about this assessment or collection and transport of specimens, call your <u>local</u> <u>health department</u>.

DOH 348-490 May 2024



To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email <u>doh.information@doh.wa.gov</u>.

The Good News

- Highly effective vaccine:
 95% VE after 1 dose
 97% VE after 2 doses
- An opportunity to bring people up to date
- Consider vaccination pre-travel
- Confirm staff are up to date



Seattle Children's – Emergency Management

Bri Enriquez, MD, Medical Director Emergency Management



Seattle Children's – Activation of Incident Command

Consider activation for any incident that requires rapid:

- Assessment
- Communication
- o Decisions/action





Emergency Management



Seattle Children's

Seattle Children's – Activation of Incident Command

- Clear decision making
- Team alignment/prioritization
- Ensure content experts can focus on their tasks
 - Set up huddles we had 4 in first
 24 hours
 - $_{\odot}~$ Operations lead to enact plans



UW Medicine

SCHOOL OF MEDICINE

Seattle Children's

HOSPITAL • RESEARCH • FOUNDATION





Seattle Children's – Activation of Incident Command

- Communications team
 - \circ Internal
 - Patient/Families
 - Referring providers
 - Social media/websites
- Planning and Logistics leads
- Liaison
 - o Public health
 - Healthcare network (NWHRN)

Emergency Management



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Community Clinic Perspective

Amy Carter, MD, Chief Medical Officer of Allegro Pediatrics



Public Health Alert Activated our Response

Public Health informed us that a patient who tested positive for measles was in our clinic during their contagious period (4 days prior to rash)

- Immediate escalation to Operational Leadership Team
 - \circ Chart review
 - Timeline: start when patient entered the building through 2 hours after they left
 - \odot Creation of exposure lists
 - Employees
 - Patients
 - \odot Communication planning then execution

Coordination of message and timing with Public Health announcement
 Post-exposure prophylaxis (PEP)



Contact Tracing

- Employees
 - \odot Verify MMR status
- Patients by vaccine status
 - \circ No MMR vaccines
 - < 6 months</p>
 - 6-12 months with no travel prophylaxis
 - \circ 1 MMR vaccine
 - 6-12 months with travel prophylaxis
 - 1-4 years

Fully vaccinated (2 MMR doses, 28+ days apart, after 12 months of age)

Coordinate with both King and Snohomish County Public Health







Communication Plan: set priorities, work in parallel

Patients

- Exposed
 - In room within 2 hours after index case
 - Eligible for MMR (give within 72 hrs)
 - Eligible for IMIG (give within 6 days)
 - Fully vaccinated
- Not exposed

Employees

• Exposed

- Working today
- Not working today
- Everyone else
 - Reminder about HIPPA



PEP & Isolation Guidance: Time is Critical

The goal is to prevent spread beyond the one index case.

• Post-exposure prophylaxis (PEP)

o < 6 months: IMIG</pre>

Needed to coordinate with Seattle Children's to administer

- \circ 6-12 months: early MMR (still need 2 after 12 months)
- \odot 1-4 years: early 2nd MMR (will complete series)

Isolation

 All patients exposed who are not fully immunized must be isolated for 21 days (28 if they receive IMIG)









Education

Prepare for the wave of anxiety

- Clinical Staff
 - Email briefing:
 - Reminder of clinical presentation
 - Testing guidelines
 - Operational workflows
- Patient Families
 - Updated measles blog
 - Nurse advice line
 - Portal messages
 - Telehealth visits



Do What We Can to Prepare for an Outbreak

Outreach to patients due for MMR	Protect employees	Ensure telehealth access	Advocacy	
 Overdue for MMR Due for MMR and well-child visit Educate families traveling internationally (+some areas of TX, NM) Ensure staffing to allow scheduling in a timely manner 	Work with Employee Health (office manager for small clinics) to review MMR status	Message patients to NOT come into clinic if exposed (through travel or any other sites) but to call or schedule telehealth if develop symptoms	Pediatricians are natural child advocates at the local, state and federal levels - Engage parents in advocacy	



Public Health Perspective

Eileen Benoliel, RN, BSN, Vaccine Preventable Disease Program Manager Libby Page, MPH, Immunization Program Manager *Public Health – Seattle & King County*



Coordination with Clinicians - Isolate

- Have a planned triage process for patients with fever and rash so these patients are not waiting in common areas with other people.
- Patients with rash and fever should not stay in waiting rooms or other common areas.
- Immediately isolate patients with suspected measles in an airborne infection isolation room (AIIR) or a private room with a closed door.
- Follow standard and airborne precautions when evaluating suspected cases, regardless of vaccination status.
- After patient is discharged, do not use or have staff enter the room for 2 hours.



Coordination with Clinicians - Notify

- Report suspected measles cases to your state or local health department immediately AND before discharging or transferring patients.
- Public Health will ensure appropriate, rapid testing and investigation.



Coordination with Clinicians - Test

- Collect the following specimens on patients with suspected measles:
 - 1. Nasopharyngeal swab placed in viral transport media
 - 2. Urine, minimum 20mL, in sterile leak proof container
 - 3. Serum, minimum 1mL, in red top or red-grey top tube
- Public Health will facilitate diagnostic testing with WAPHL



Coordination with Clinicians - Manage

- Identify potentially exposed persons at the facility: patients, visitors, staff, volunteers
- Public Health will identify close contacts and recommend postexposure prophylaxis (PEP) for eligible people



Presumptive Evidence of Immunity

- Written documentation of ≥1 doses measles-containing vaccine administered on or after the first birthday for preschool-age children and adults not considered high risk
- Written documentation of 2 doses measles-containing vaccine for schoolage children and adults at high risk:
 - Healthcare personnel
 - International travelers
 - Students at post-high school educational institutions
- Laboratory evidence of immunity
- Laboratory confirmation of disease
- Birth before 1957



Vaccine Recommendations & Best Practices

- **Assess** patient immunization status at every visit, including sports physicals and routine care.
- Strongly recommend MMR vaccination based on the recommended schedule, health condition, occupation, and other risk factors.
- Ask patients about upcoming international travel and recommend MMR vaccination based on recommended schedule; vaccinate at least 2 weeks before travel. Under-immunized patients should still receive MMR vaccination if their departure is sooner.
- Make sure patients understand the risks of not getting vaccinated. Let patients know that if exposed to measles, they will need to isolate for 21 days. Explain potential complications from measles, like pneumonia, hearing loss, intellectual disability, and death.



Vaccine Recommendations & Best Practices

- Use Reminder / Recall systems (letters, postcards, telephone, emails, texts) to ensure that patients who are due or overdue for MMR vaccinations are notified.
- Track immunity status of staff and volunteers.
 - Encourage staff and volunteers to provide documentation of measles vaccination or laboratory evidence of disease or immunity (IgG).
 - Store the records securely and maintain confidentiality.
- Consider **mandatory vaccination** (except for medical exemptions) or presumptive evidence of immunity for healthcare workers.











MMR Immunization Coverage by County

19-35 month olds with ≥1 dose, 2023



https://doh.wa.gov/data-and-statistical-reports/washington-tracking-network-wtn/immunization-data/county-public-health-measures-dashboard



Resources for Healthcare Providers

- <u>Measles One-Pager for Healthcare Providers</u> Project Firstline and AAP
- <u>Measles For Healthcare Professionals CDC</u>
- Measles Specimen Collection Instructions for RT-PCR WA DOH
- Measles Specimen Collection Instructions for Serology WA DOH
- Immunization Schedules CDC
- <u>Safety Information for Measles, Mumps, Rubella (MMR) Vaccines CDC</u>



Additional Resources

For Infection Preventionists

- Interim Measles Infection Prevention Recommendations in Healthcare Settings CDC
- <u>Measles Playbook</u> APIC Emerging Infectious Diseases Task Force

For Laboratories

- Public Health Laboratories Lab Test Menu WA DOH
- <u>Measles Specimen Shipping Guide</u> WA DOH

For the General Public and International Travelers

- <u>Measles Resources</u> PHSKC
- Plan for Travel Measles CDC



Resources

- Red Book
- CDC

o <u>Clinical Overview of Measles | Measles (Rubeola) | CDC</u>

- Washington State DOH
 - o Measles | Washington State Department of Health
 - o <u>348-490-MeaslesAssessmentQuicksheetProviders.docx</u>
 - o <u>Measles Post-Exposure Prophylaxis (PEP) for Non-Symptomatic</u> <u>Susceptible Contacts</u>
- PPN
 - o <u>EMS250221_MeaslesPosterUpdate_250221v2.pdf</u>
 - o Recognizing Measles in Your Patients | Pediatric Pandemic Network
 - o Measles FAQ for Families & Caregivers | Pediatric Pandemic Network

