


**MEASLES:
IT ISN'T JUST A LITTLE
RASH**

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ROME 2019 NEW ENGLAND
REGIONAL INTERGRATING
MEDICAL EDUCATION Providence, RI, August 8 - 11

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Conflict of Interest Disclosure

I have no conflicts and nothing to disclose


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Learning Objectives

- Review the epidemiology and spread of measles
- Recognize the clinical presentation of measles
- Facilitate discussions with anti-vaxxers about measles vaccine

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2019 is a very bad year for measles
It's not just the US outbreaks. Measles is making a global comeback.

CBS NEWS U.S. measles outbreak hits highest mark in 25 years

Washington is under a state of emergency as measles cases rise

By Amir Vora, CNN
Updated 10:26 PM ET, Tue January 29, 2019

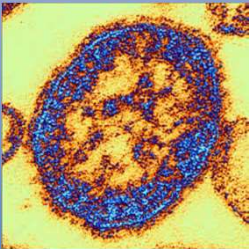
Measles cases quadruple globally in 2019, says UN **BBC**

npr N.Y. Suburb Declares Measles Emergency, Bars Unvaccinated Minors From Public Places
January 27, 2019, 10:48 AM EST

The New York Times Measles Outbreak Now at 880 Cases, With Fastest Growth Still in New York
Warming weather usually slows transmission of the virus, but it is not clear that this outbreak is fading, experts said.

What is Measles?

- Respiratory disease caused by Rubeola virus
- Single-stranded
- Enveloped RNA virus
- Paramyxoviridae family



History of Measles

The first known written account of measles was by a Persian doctor **9th century**

Francis Home, a Scottish physician, demonstrated that measles is caused by an infectious agent in the blood of patients. **1757**

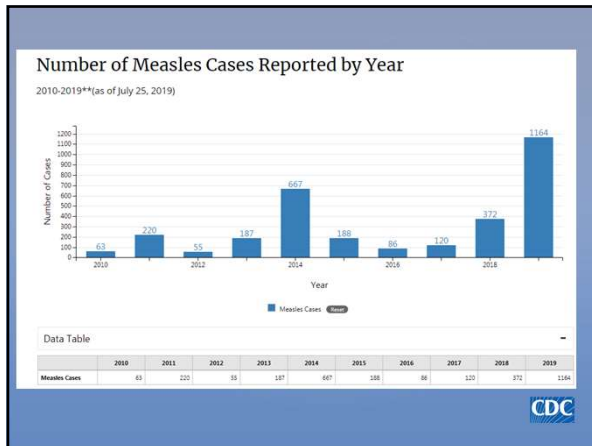
Measles became a nationally notifiable disease requiring U.S. healthcare providers and laboratories to report all diagnosed cases. In the first decade of reporting, an average of 6,000 measles-related deaths were reported each year. **1912**

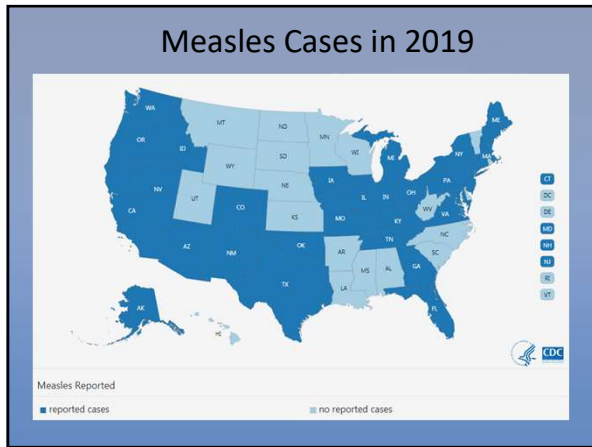
Dr. John Enders and colleagues licensed a measles vaccine in the US **1963**

An improved vaccine was developed by Dr. Maurice Hilleman. In 1971, he put his vaccines for measles, mumps and rubella together to make MMR, replacing a series of six shots with just two. **1969**

2000-2015 **2000** Measles was declared eliminated* from the U.S.

According to the World Health Organization, measles vaccination prevented an estimated 20.3 million deaths worldwide. It costs approximately one U.S. dollar to immunize a child against the disease, making the vaccine one of the best buys in public health.





MEASLES IS VERY CONTAGIOUS

ONE PERSON WITH MEASLES CAN SPREAD IT TO 9 OUT OF 10 UNVACCINATED PEOPLE AROUND THEM.

PAHO WHO UNICEF

#STOPMEASLES #VACCINATOR

1 person can infect up to 90% of close contacts who are not immune

Measles is highly contagious. It spreads when an infected person coughs or sneezes.

Infected people can spread measles to others from four days before through four days after the rash appears

Measles is Just a Plane Ride Away

- Measles is still common in many other countries.
- Unvaccinated travelers continue to get measles in other countries and bring it into the United States. Then they can spread it to others.
- Anyone who is not protected against measles is at risk of getting the disease.

Clinical Features

- Incubation Period: 7 – 14 days after a person is infected
- High fever: 103°F or higher
- **3 Cs:** Cough, Coryza, Conjunctivitis
- Koplik Spots: Tiny white spots inside the mouth

Clinical Features

- 3 – 5 days after symptoms begin, a rash breaks out
- When the rash appears fever spikes to 104°F
- After a few days, the fever subsides and the rash fades

Recognizing the Rash

- Flat red spots → on top of which small raised bumps may also appear
- Starts on face at the hairline; spreads downward to neck, trunk, arms, legs and feet
- Spots may become joined together as they spread from head to rest of the body

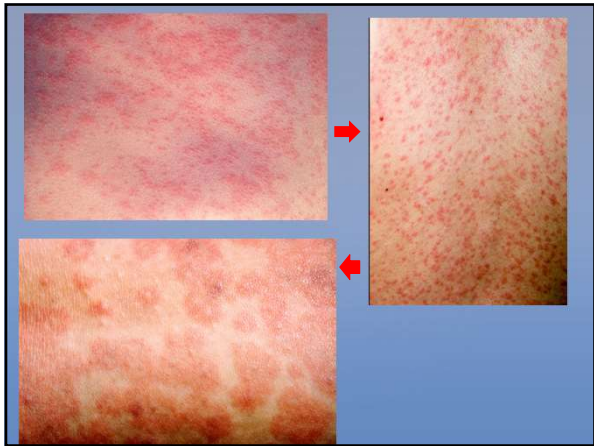
Photos of People with Measles

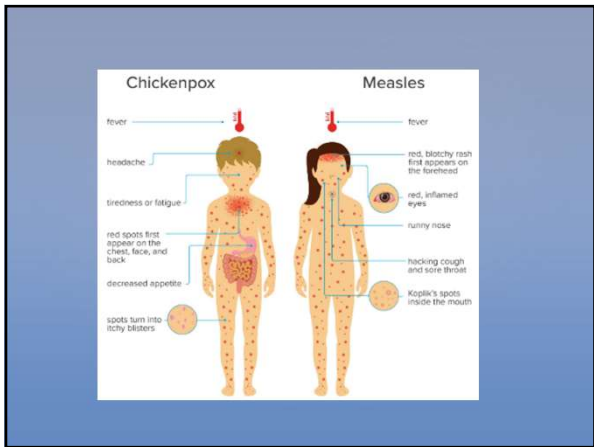


Koplik spots inside the mouth




Measles skin rash





People at High Risk for Complications

- Infants and children aged <5 years
- Adults aged >20 years
- Pregnant women
- People with compromised immune systems, such as from leukemia, HIV infection

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

Complications

<p>Common complications</p> <ul style="list-style-type: none">• Ear infections• Diarrhea	<p>Long-term complications</p> <ul style="list-style-type: none">• Subacute sclerosing panencephalitis (SSPE)
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Severe complications

- Pneumonia
- Encephalitis

Can cause death: 1 or 2 out of 1,000 people with measles

Measles may cause pregnant non-immune women to give birth prematurely or have a low-birth-weight baby

Subacute sclerosing panencephalitis (SSPE)

- Very rare, but fatal disease of the CNS
- Results from measles acquired earlier in life
- Develops 7-10 years after a person had measles
- Risk of developing SSPE higher for a person who acquires measles at < 2 years of age

Testing

- Measles RT-PCR from nasopharynx or urine
- Serologic test for Measles IgM antibody
- Significant rise in measles IgG by a standard serologic test
- Healthcare providers should report suspected measles cases to their local health department within 24 hours

Treatment of Measles

- Supportive care is the mainstay
- Antiviral therapy not established, occasional use of ribavirin for severe cases (IV)
- Vitamin A deficiency is associated with increased mortality
- Evidence suggests that vitamin A doses of 200,000 IU/day x 2 days reduce severity, mortality, especially if child is < 2 yo

Bichon et al. Case report: Ribavirin and vitamin A in a severe case of measles. *Medicine (Baltimore)* 2017 Dec;96(50):e9154.
 Madigan et al. Risk factors for measles death. Kyegga District, western Uganda, February–September, 2015. *BMC Infect Dis.* 2017 Jul 3;17(1):462

PREVENTION



STOP

Do you have Measles symptoms?

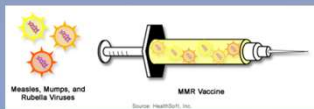
- Fever
- Cough
- Runny nose
- Sore and watery “pink” eyes
- Blotchy rash starting on the face

PLEASE put on one of the masks provided on this stand **NOW**



Alert reception that you are returning to your car, where a doctor will assess you with priority.

MMR Vaccine



Median MMR Vaccine Effectiveness		
Disease	1 dose	2 doses
Measles	93%	97%
Mumps	78%	88%
Rubella	97%	N/A

Vaccination is the Best Protection Against Measles

- Two doses of MMR (measles-mumps-rubella) vaccine are **97% effective** at protecting against measles.
- MMR vaccine protects you and people who are unable to be vaccinated because they are too young or have weakened immune systems.



Who Should Get Vaccinated

Children

- 1st dose: 12-15 months of age
- 2nd dose: 4-6 years of age

Students at post-high school educational institutions with no evidence of immunity*

2 doses separated by at least 28 days

Adults born after 1957 with no evidence of immunity*

At least 1 dose

*Acceptable presumptive evidence of immunity against measles includes at least one of the following: written documentation of adequate vaccination, laboratory evidence of immunity, laboratory confirmation of measles, or birth before 1957

Who Should Get Vaccinated

International travelers with no evidence of immunity*

- Infants 6-11months of age: 1 dose
- Children > 12 months of age (including teenagers, adults): 2 doses separated by at least 28 days

Health care workers with no evidence of immunity*

2 doses separated by at least 28 days

*Acceptable presumptive evidence of immunity against measles includes at least one of the following: written documentation of adequate vaccination, laboratory evidence of immunity, laboratory confirmation of measles, or birth before 1957

Health care worker Immunity

- Immune if born before 1957 (consider titres)
- Immune if born after 1957 and have had 2 doses of MMR (written documentation)
- Titers may be drawn if unsure
- Disease and vaccine confer lifelong immunity
- If immune, pregnant HCP's may care for children with measles

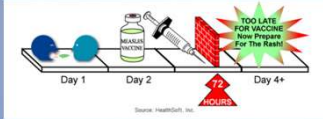
MMR: Adverse Reactions

Fever	5 – 15%
Rash	5%
Joint Symptoms	25%
Thrombocytopenia	< 1/30,000 doses
Parotitis	Rare
Deafness	Rare
Encephalopathy	<1/1,000,000 doses

Vaccine Associated “Measles”

- MMR is a live vaccine → can cause “look-alike” rashes in 5% of vaccines
- Can get transient measles rash 7-10 days after vaccination, fever
- Work up can show Measles IgM + serology
- Not contagious, does not need isolation

PEP for Measles



- MMR vaccine within 72 hours of exposure
- If not administered within 72 hours as PEP should be offered at a later time

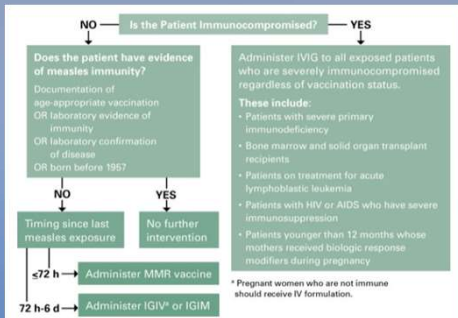
PEP for Measles



- IG if given within 6 days of exposure:
 - may prevent or minimize the disease
 - prevent complications in high risk pts with no e/o immunity (infants, unimmunized pregnant woman, severely immunocompromised pts)
- IG is not used for outbreak control
- DO NOT administer IG and MMR together

Tunis et al. Updated NACI recommendations for measles post-exposure prophylaxis. Can Commun Dis Rep. 2018 Sep 6; 44(9): 226-230

Care of the Exposed Patient



MEASLES OUTBREAK

Protect Families & Communities with MMR Vaccine

The United States has had more than 1,000 cases of measles in 2019.

MEASLES
Measles spreads through the air when an infected person coughs or sneezes. So, to understand how it can spread so fast, ask your child if they've ever been around someone infected if they are not vaccinated.

Measles starts with a fever, then a rash in a cough, runny nose, and red eyes. These signs usually appear 7-14 days after infection. The rash starts with small, red spots on the face and neck, and then spreads to the rest of the body. Measles can cause complications, such as the 10 days of pneumonia that occurs in one out of 100 children.


CHILDREN NEED 2 DOSES OF MEASLES VACCINE
The best way to protect against measles is with a combination vaccine that also protects against other diseases, including mumps, rubella and chickenpox. The MMR vaccine is proven to be very safe and effective.

MMR VACCINE IS SAFE & EFFECTIVE
The MMR shot is very safe and effective at preventing measles, mumps, rubella, and chickenpox. The only possible side effects are mild, such as a sore throat or fever, which usually go away within a few days. In very rare cases, severe allergic reactions can occur, usually within minutes or hours of receiving the vaccine. Serious allergic reactions are extremely rare. Scientific studies and reviews continue to show that there is no link between measles and autism. There is also no link between mumps and autism. There is no link between rubella and autism. Numerous scientists have studied MMR vaccine and found no link between MMR vaccine or thimerosal and autism.

BEFORE TRAVELING ABROAD
Each year, thousands of people get infected with measles in other countries and bring the disease into the United States and spread it to others. Before any international travel—

- Infants 12 months old need 1 dose of measles vaccine
- Children 12 months and older need 2 doses (separated by at least 28 days)
- Teenagers and adults who do not have evidence of immunity to measles should get 2 doses (separated by at least 28 days)

There are also other diseases that travel easily between countries and which you may not have been vaccinated against. If you are planning to travel abroad, talk to your healthcare provider about other vaccines you may need.



<https://www.cdc.gov/measles/dowloads/fs-measles-outbreak-508.pdf>

MMR and Autism

- In 1998, Andrew J. Wakefield, et al published a paper in *Lancet*: suggesting a link between MMR vaccine and autism
- This study was subsequently found to be based on falsified results → paper was retracted by the journal, lead author's medical license was revoked
- Unfortunately, the damage was done → **"vaccine hesitancy"** → outbreaks of measles

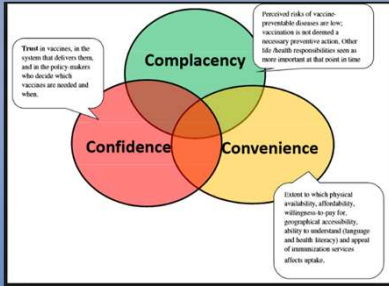
MMR and Autism

Multiple large studies including a meta-analysis, which involved 1.2 million children, have repeatedly demonstrated that there is no causal link between MMR vaccine and autism.

- Hviid A, Hansen JV, Frisch M, et al. Measles, mumps, rubella vaccination and autism: a nationwide cohort study. *Ann Intern Med.* 2019 Mar 5. [Epub ahead of print]
- Taylor LE, Swerdfeger AL, Eslick GD. Vaccines are not associated with autism: An evidence-based meta-analysis of case-control and cohort studies. *Vaccine.* 2014;32(29):3623-3629
- Hornig M, Brieseman T, Buie T, et al. Lack of association between measles virus vaccine and autism with enteropathy: a case-control study. *PLoS ONE.* 2008;3(9):e31140
- Smeeth L, Cook C, Fombonne E, et al. MMR vaccination and pervasive developmental disorders: a case-control study. *Lancet.* 2004;364(9438):963-969
- Jain A, Marshall J, Buikema A, et al. Autism occurrences by MMR vaccine status among US children with older siblings with and without autism. *JAMA.* 2015;313(15):1534

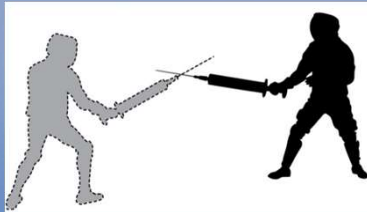
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Vaccine Hesitancy: one of the top 10 threats to global health (WHO)

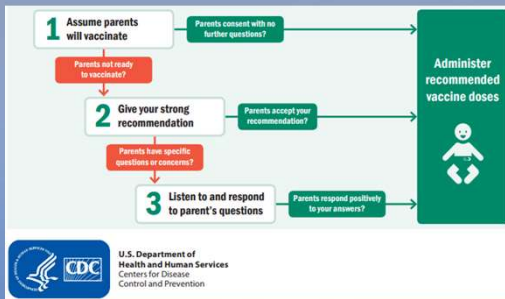


CDC Tool Kit

www.cdc.gov/measles/toolkit/healthcare-providers.html



CDC Tool Kit



Positive Approach

- Instead of saying *"What do you want to do about shots?"*, say *"Your child needs three shots today."*
- Instead of saying *"Have you thought about the shots your child needs today?"*, say *"Your child needs DTaP, Hib, and Hepatitis B shots today."*

Try, Try, Try Again!

- "I strongly recommend your child get these vaccines today...."
- "...These shots are very important to protect him from serious diseases."
- "...I believe in vaccines so strongly that I vaccinated my own children on schedule."
- "...This office has given thousands of doses of vaccines, and we have never seen a serious reaction."

Resources

Table. Educational Resources for Health Care Providers and Parents	
Health Care Providers	
Children's Hospital of Philadelphia Vaccine Education Center	www.chop.edu/centers-programs/vaccine-education-center
Centers for Disease Control and Prevention: Measles	www.cdc.gov/measles/index.html
World Health Organization: Measles	www.who.int/immunization/diseases/measles/en/
Immunization Action Coalition	www.immunize.org/handouts/measles-mmir-vaccines.asp
Parents	
Children's Hospital of Philadelphia Vaccine Education Center	www.chop.edu/centers-programs/parents-pack
Centers for Disease Control and Prevention: Immunization Education and Training	www.cdc.gov/vaccines/ed/patient-ed.html
Voices for Vaccines	www.voicesforvaccines.org/home/

Voices for Vaccines Home About Vaccines Tools Why I Choose Blog Join Us Support
PARENTS SPEAKING UP FOR IMMUNIZATION

**Pro-Child.
 Pro-Community.
 Pro-Vaccine.**

Voices for Vaccines (VFV) is a parent-driven organization supported by scientists, doctors, and public health officials that provides parents clear, science-based information about vaccines and vaccine-preventable disease, as well as an opportunity to join the national discussion about the importance of on-time vaccination.

[Find out More](#)



Because we don't want our children to suffer from diseases previous generations worked so hard to prevent

Take home points

- Resurgence of a preventable disease
- Highly contagious disease
- 3 clinical stages: IP, prodromal, final: rash
- High suspicion, THINK Measles!
- Isolation & Prevention are Key
- Vaccinate vaccinate vaccinate!

References

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- Rosenthal T. Fighting Disinformation With Credible Information About Vaccines. Infectious Disease Special Edition June 2019
- Mandell, Douglas and Bennett's Principles and Practice of Infectious Diseases: 8th Edition
