Revisiting Old Foes

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Disclosures
• I have no disclosures
• I do not intend to mention off label uses of drugs

Objectives
• 1. Diagnose measles,
• 2. Prevent spread of measles and
• 3. Encourage patients to get vaccinated.
The Foe: Measles

- Measles remains endemic in most countries outside the Western hemisphere including Europe, Asia, the Pacific and Africa
- Worldwide, 19 cases of measles per 1 million persons are reported each year; about 89,780 die

Images courtesy of CDC and AAP

www.cdc.gov/measles/travelers.html

CDC Travel Notices

- Israel
- Japan
- Kazakhstan
- Moldova
- England
- France
- Greece
- Italy
- Indonesia
- Philippines
- Serbia
- Congo
- Columbia
- Brazil

Images courtesy of CDC

www.cdc.gov/measles/travelers.html

2019 Cases* in 31 States


*As of October 3, 2019

Images courtesy of CDC

www.cdc.gov/measles/
2019 Outbreaks Nearby*

- Sullivan and Orange Co, NY: ended 10/3
- Rockland, NY: 312 cases, ended 9/25/19
- NYC: 654 cases, outbreak over 9/3/19
- NJ Cases: 18 in 2019; 33 in 2018

* As of 10/3/19

www.cdc.gov/measles/cases-outbreaks.html

Measles

- RNA virus: family Paramyxoviridae, genus Morbillivirus
- Transmitted by droplets and air
- Extremely contagious
- Incubation period 8 to 12 days
- Contagious 4 days prior to 4 days after the rash appears

Measles in the US

- Vaccine licensed 1963; 95% effective
- US measles free since 2000

www.cdc.gov/measles/cases-outbreaks.html

As of October 3, 2019
Measles in the US

- 2014: over 600 cases, 23 outbreaks
- 2018: 137 cases, 17 outbreaks
- 2019: 1250 cases as of 10/3/19
- US travelers bring measles home
- Travelers to US bring measles along
- Secondary spread to unimmunized contacts

www.cdc.gov/measles/index.html

Measles Cases By Month

www.cdc.gov/measles/cases-outbreaks.html

Clinical Illness

- Fever, cough, conjunctivitis
- Day 2 to 3 of fever, Koplik spots appear
- One to 3 days later, rash appears on the face, maculopapular to confluent
- Rash spreads and then fads over days

Images courtesy of CDC

Photos from CDC
Fever, Cough, Conjunctivitis

Photos courtesy of CDC

Koplik spots

Photos courtesy of CDC

Confluent Rash

Photos courtesy of CDC
Complications

- Otitis media (7-9%)
- Respiratory: pneumonia (viral and bacterial 1-6%); laryngotracheitis
- Encephalitis (1/1000)
- Subacute sclerosing panencephalitis: 5 to 10 years later (1/10,000)

Strebel PM, Orenstein WA. Measles. NEJM 2019;381:349-57

Diagnosis

- Clinical
- Confirm with serology: IgG and IgM
- Virus isolation: nasopharyngeal swab, urine
- Report all suspected cases: local health department – if not available, call the state

Treatment

- Isolate the patient: air and droplet
- Report the case
- Vitamin A: Once daily for two days
  - 200,000 IU age > 12 mo; 100,000 IU 6-11 mo; 50,000 IU < 6 mo
- Ribavirin: in vitro, not approved

Prevention

- Measles vaccines: MMR and MMRV
- Routine: 12-15 mo, 4-6 yr
- Post-exposure: within 72 hours
- Immunoglobulin 0.25 ml/kg (max 15)
- Travelers/outbreaks: MMR for ages 6 to 12 mo; child: give 2nd dose

Infection Control

- Staff: all should be immune
- Proof of immunity: 2 doses of vaccine or seropositive
- NOTE: no need for serology if 2 doses given
- Born 1957 and later: 2 doses; seropositive
- Born before 1957: generally considered immune but serology recommended if not immunized; vaccine if negative

Infection Control

- Triage is essential
- When possible, make the diagnosis outside of your office: car
- If the child is in your office, put into a room
- Mask on the child if possible
- The entire area is considered contaminated for 2 hours after the patient leaves
- Air in offices often re-circulated
**Take Home Messages**

- Think measles: fever, cough, conjunctivitis and then rash
- Notify local health department stat
- Get the proper specimens: serology and viral culture (NP preferred)
- Get everyone protected and immunized: staff and patients

**What Happened?**

- Vaccine hesitancy
- Vaccine refusal
- Access to care
- Complacency
- Information overload

**Vaccine Hesitancy***

- The media empire: > 400 anti-vaccine websites
- The political machine
- Deliberate predation: NYC
- Lack of robust vaccine advocacy
- New media and vaccine information flow

*Peter Hotez, Dina Borzekowski: Webinar 7/17/19*
Public Concerns

- Are vaccines safe?
- The vaccine schedule: are there too many, too soon?
- Is natural disease better?
- What about adjuvants and additives?
- Why are vaccines mandated?


Immunization Safety

- Starts during development
- Animal studies before human studies
- Safety and efficacy
- Investigational New Drug Application
- Phase 1, 2 and 3 clinical trials

www.fda.gov/BiologicsBloodVaccines/Vaccines/default.htm

Post-licensure Safety

- Vaccine adverse events reporting system (VAERS)
- Vaccine Safety datalink (VSD)
- Clinical immunization safety assessment (CISA)
- Manufacturer
- University, interested investigators

www.cdc.gov/vaccinesafety/ensuringsafety/monitoring/index.html
Are Vaccines Safe?
• YES
• Safety is a priority in public health
• All medicines have side effects
• Adverse events following immunization must be reported and are being studied

Vaccine Schedule
Why so soon?
• Early infection often more dangerous
• Delaying doesn’t decrease adverse events
• Delaying leaves children unprotected

Vaccine Schedule
Why so many?:
• Prevention beats trying to cure
• More in this case is better
• The immune system is designed to handle multiple antigens at once
Is Natural Disease Better?

• No way!
• Very risky approach
• An ounce of prevention makes more sense
• Not true for many of the diseases
• Not an approach that protects children

Preservatives, Additives, Adjuvants and Residuals

• Thimerosal, phenol, 2-phenoxyethanol
• Sugars, amino acids, proteins (gelatin, albumen, cow derived stuff)
• Aluminum salts enhance immune response
• Antibiotics, formaldehyde, cellular products (egg, yeast)

Additives and Adjuvants

• There is a reason for each
• Additives may preserve or stabilize
• Residuals are miniscule amounts left over from the production process
• Adjuvants are there to boost the response
Why Mandate Vaccines?
• Prior to mandates, rates were low and disparities abounded
• Look at adult immunization rates
• Why mandate education: children are our future
• Why immunizations: Ounce of prevention will always be superior to pounds of cure

What Can You Do?
• Nurses and doctors are trusted sources of information
• Give a strong recommendation
• Listen to and respond to questions
• Communicate effectively
• Stay up to date; read!

National Immunization Awareness Month 8/2019
• You have the power to protect against vaccine-preventable diseases
• Vaccines are safe and effective
• Vaccinate on time
• Vaccine-preventable diseases are still a threat

www.cdc.gov/vaccines/events/niam/hcp/key-messages.html
There is no vaccine against stupidity!

Smiling is a contagious condition!