

Discloser Statement

I HAVE NOTHING TO DISCLOSE

Adult Immunization ACIP UPDATE

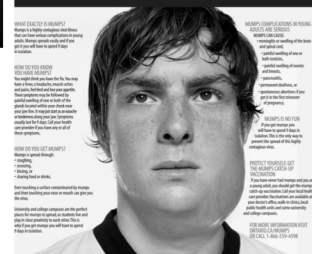


ACIP Recommendations

- Third dose of MMR vaccine recommended during an outbreak of Mumps
- Heplisav-B recommended as option for adults over the age of 18 to prevent hepatitis B infection
- Shingrix (HZ/su) is the preferred vaccine to prevent Herpes Zoster recommended for adults 50 and older



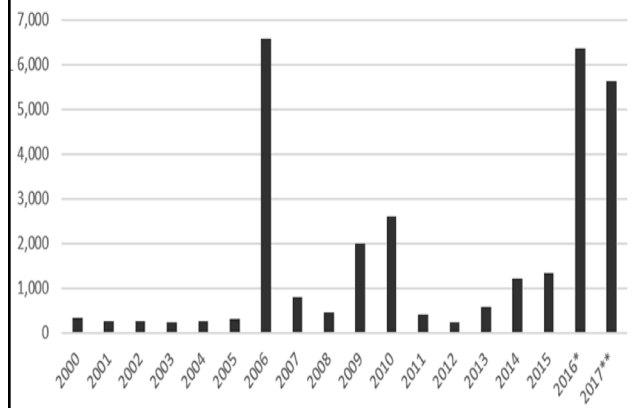
MUMPS IS NOT JUST FOR KIDS ANYMORE



Mumps Clinical Features

- Incubation period 14-18 days
- Nonspecific prodrome of myalgia, malaise, headache, low-grade fever
- Parotitis in 30%-40%
- Up to 20% of infections asymptomatic

Mumps Cases in U.S., by Year



Mumps outbreaks

- Among young adults at universities and other communities
- The outbreaks have been in groups with relatively high vaccine rates for completion of 2 doses of MMR
- It is not clear as to the cause but waning immunity following immunization and antigenic differences between the virus strain and the strains in the vaccine may be contributing factors
- Although the evidence supporting the effectiveness of a third dose of MMR is limited, the evidence for vaccine safety is reassuring
- ACIP voted to recommend the use of a third dose of MMR during an outbreak

Effect of Third Dose of MMR Vaccine in an Outbreak of Mumps at the University of Iowa

- 20,496 students in the 2015-2016 academic year
- Mumps diagnosed in 259 students
- 98.1% had received at least 2 doses of MMR
- During the outbreak 4,783 received a third dose
- The attack rate with three doses versus two doses was 6.7 vs. 14.5 per 100,000 $p < 0.001$
- Students had more than 9 times the risk for mumps if they had received the second MMR more than 13 years before the outbreak

MMR Vaccine Contraindications and Precautions

- Severe allergic reaction to vaccine component or following prior dose
- Pregnancy
- Immunosuppression
- Moderate or severe acute illness
- Recent blood product

ACIP retrospectively assessing whether adding PCV 13 to the schedule for adults over the age of 65 has led to improved pneumonia outcomes



To become comfortable with uncertainty is one of the primary goals in the training of a physician

- 1) William Osler MD
- ★ 2) Sherwin Nuland MD
- 3) Michael Crichton MD
- 4) Atul Gawande MD



Sherwin Nuland MD

- Surgeon and author who taught bioethics and history of medicine at Yale medical school
- Book : "How We Die: Reflections on Life's Final Chapter" NY Times best seller, finalist for the Pulitzer Prize
- TED talk discussed his struggle with severe depression and obsessive thoughts
- Produced a lecture series for the Great Courses titled The History of Scientific Medicine Reviewed Through Biography
- Died of Prostate Cancer at home March 2014

Sir William Osler MD

- Canadian Physician and one of the four founding physicians of Johns Hopkins Hospital
- Created the first residency training program
- Brought Medical students out of the classroom and emphasized bedside teaching
- Author of The Principles and Practice of Medicine
- Renowned physician, author, historian, and practical joker

Osler

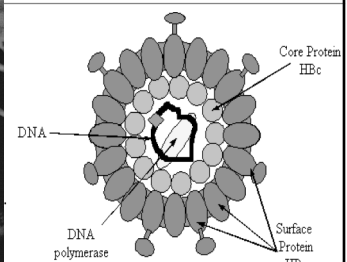
- The young physician starts life with 20 drugs for each disease and the old physician ends life with one drug for 20 diseases
- One of the first duties of the physician is to educate the masses not to take medicine
- The philosophy of one age have become the absurdity of the next, and the foolishness of yesterday has become the wisdom of tomorrow
- He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all
- Listen to your patient, he is telling you the diagnosis

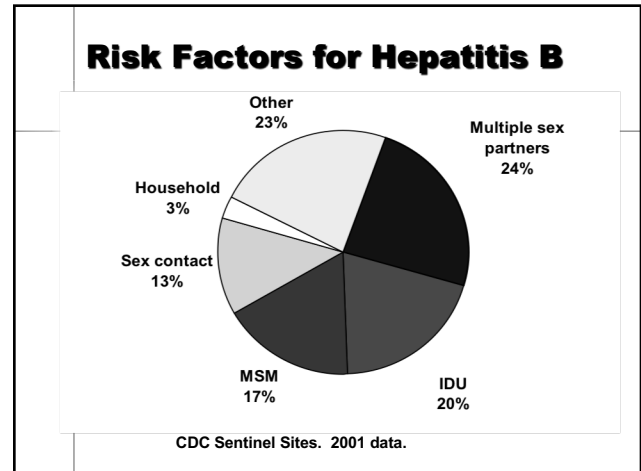
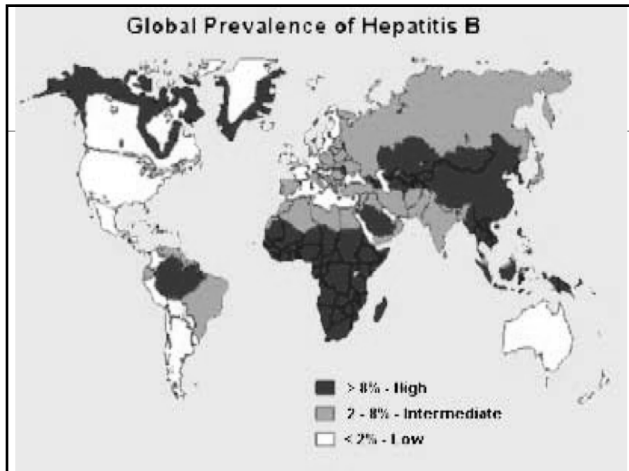
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Michael Crichton MD

- Graduated Harvard Medical School, best selling author, producer, director, and screen writer
- Never received a medical license
- His Books have sold over 200 million copies worldwide
- Only creative artist to have simultaneous No. 1 status in US for T.V., Film, and Book sales (ER, Jurassic Park, and Disclosure)
- Died November 4, 2008

Hepatitis B





Hepatitis B Vaccine Adult Candidates

- Men who have sex with men
- Heterosexual with multiple partners
- Persons with a recently acquired sexually transmitted disease
- Commercial sex workers
- Injection drug users
- Male prison inmates
- Persons receiving hemodialysis
- People with chronic liver disease

Hepatitis B Vaccine in Adult Diabetes Patients

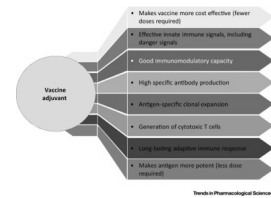
- ACIP recommendation to give Hepatitis B vaccine to unvaccinated adults with diabetes who are younger than 60 years old
- Unvaccinated adults older than 60 may receive the Hepatitis Vaccine at the discretion of their health care provider
- CDC has investigated numerous Hep B outbreaks in long care term facilities and nursing Homes
- Use of blood glucose meter for more than one resident without cleaning and disinfection between uses, improper sterilization of equipment, failure to consistently wear gloves and perform hand hygiene between finger stick procedures

Heplisav-B approved by ACIP

- Heplisav-B (HepB-CpG) recommended by ACIP 2/21/2018
- Heplisav-B approved for 18 years and older
- Two doses 1 month apart
- 4 trials, Higher rate of protection with 2 doses one month apart of Heplisav-B (7,056 subjects) then three doses over 6 months with Energix-B (3,214 subjects)
- Anti-HBs>10 achieved in 90%-100% of HepB-CpG versus 70.5-90.2% with Energix-B in diabetic patients protection was about 90% versus 65%
- Safety evaluation of 9,871 subjects receiving HepB-CpG versus 4,385 subjects receiving Energix B
- HepB-CpG mild adverse event, serious adverse event, or cardiovascular event was 45.65, 5.4%, and 0.27% versus Energix -B 45.7%, 6.3%, and 0.14%
- Post marketing evaluation will be ongoing

HepB-CpG yeast derived recombinant HBsAg

- Combining purified HBsAg with small synthetic immunostimulatory cytidine-phosphate-guanosine oligodeoxynucleotide (CpG-ODN) motifs (1018 adjuvant)
- The 1018 adjuvant binds to binds to Toll-like receptor 9 to stimulate a direct immune response to HBsAg



Herpes Zoster

- 1 million episodes occur annually in the United States
- Lifetime risk of zoster estimated to be at least 20%-30%
- 50% of persons living until age 85 years will develop zoster

Zostavax

- Recommended in 2006 for patients >60 years old
- 14X the potency of Varicella vaccine
- 39,000 adults >60 over 3 years vaccine versus placebo
- Shingles reduced by 51% , 64% in those (60-69)
- PHN reduced by 39%

Contraindications to Shingles Vaccine

- Live vaccine
- HIV/AIDs
- Immunocompromised by medication (MTX, corticosteroids ,TNF inhibitors)
Cancer treatment- chemotherapy, radiation
- History of leukemia, lymphoma
- Pregnant
- Active, untreated TB

ZOE-50 study (Zoster Efficacy in Adults 50 years and older study)

- HZ/su vaccine studied in 2 studies with over 38,000 patients over age 50 , half got two doses of vaccine and half got placebo
- After 3 years there were 6 cases of Shingles in the vaccinated group and 210 in the placebo group for and efficacy of 97.2%
- There was no variation in vaccine efficacy with age
- HZ/su vaccine is a subunit vaccine with an adjuvant, not a live attenuated vaccine, ? could be given to immunocompromised patients
- Most common adverse events were pain at the injection site and myalgia(84.4%) versus placebo (37.5%)
- Serious adverse events were similar between the groups (1.1% vs 1.3%)
- Two dose vaccine given 2 months apart
- Recently approved by ACIP Oct 2017

Shingrix versus Zostavax

- ACIP voted 8 to 7 to recommend Shingrix over Zostavax
- Shingrix versus Zostavax efficacy estimate
- Ages 60-69 (97% versus 64%)
- Ages 70-79 (91% versus 41%)
- Older then 80 (91% versus 18%)

Shingrix versus Zostavax

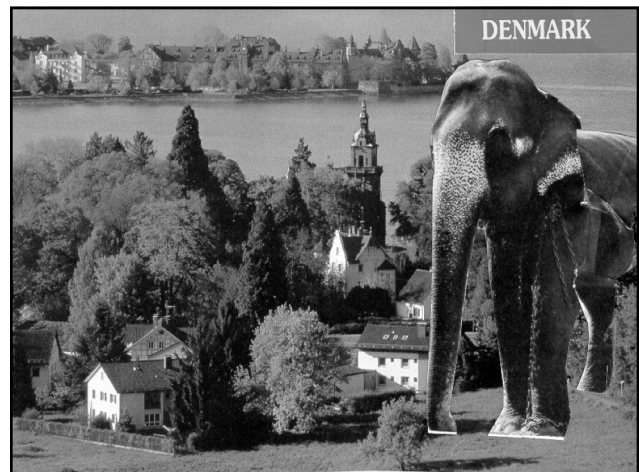
- Shingrix is 2 IM shots separated by 2-6 months
- Zostavax is one SC injection
- Shingrix is \$280 for both shots
- Zostavax is \$220 for the immunization
- Shingrix improved protection and longer duration of immunity

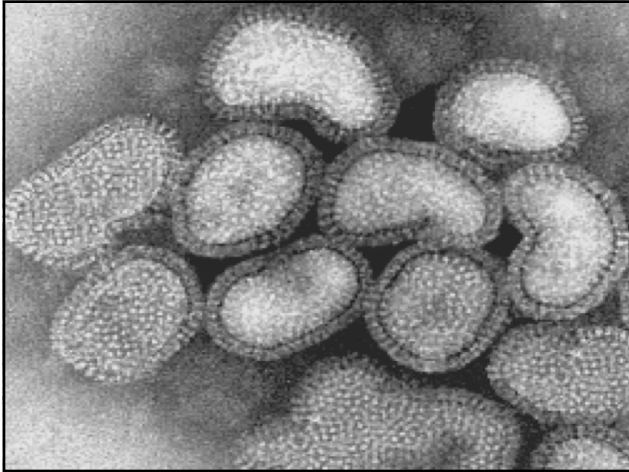
Shingrix subunit vaccine

- Glycoprotein E isolated
- Two Adjuvants (monophosphoryl lipid A and QS-21)



- Pick any number between 2 and 10
- Multiply that number x 9
- Add the two digits of that number together
- Subtract 5 from that number
- Pick the letter which corresponds to that number in the alphabet (A=1 B=2 C=3 D=4)
- Pick a country which begins with that letter.
- Now take the second letter of that country and choose a large animal which begins with that letter





Influenza

- Influenza got its name in Italy in the 1700s because the illness was thought to be caused by the "influence" of the stars



Influenza and age related complications

- 80%-90% of influenza related deaths in patients older than 65
- 50%-70% of hospitalizations in patients older than 65



High Dose Influenza Vaccine



- Four times the Potency
- 65 years and older
- 24% more effective in preventing influenza
- Increased incidence of self limited side effects
- 3,745 high dose Vaccine versus 3,827 standard dose vaccine
- Influenza in High dose versus regular vaccine 228 versus 301 (1.4% vs. 1.9%)
- Number needed to vaccinate 200, BUT did not stratify for efficacy for moderate or severe illness and results may differ depending on the match to the circulating strain

Fluad influenza vaccine

- Approved for 65 years and older
- Adjuvant vaccine (oil in water emulsion of squalene oil)
- Adjuvant is added to enhance the immune response
- Initially approve in Italy in 1997, at the time of Fluad approval in the U.S. in 11/2015 it had been licensed in 38 countries
- An Observational study in Canada in 2011/2012 showed improved efficacy over nonadjuvant influenza vaccine in preventing laboratory confirmed influenza
- Local pain, redness and swelling at injection site most common side effect
- Fluad versus standard influenza vaccine increased rate of systemic reactions such as (headache, fever, malaise,) 17% vs. 12%

Recombinant Influenza Vaccine Flublok

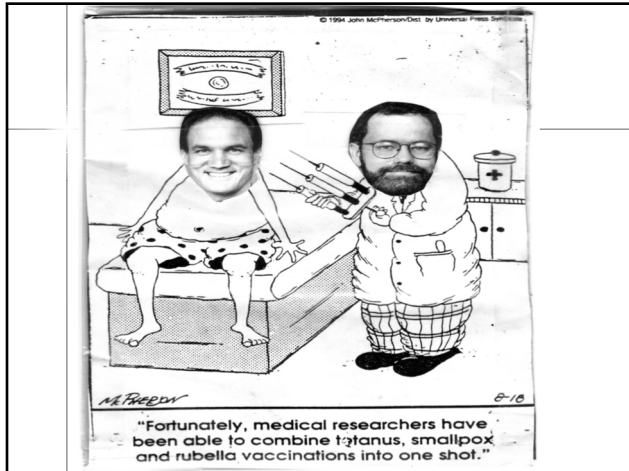
- Flublok (RIV4) was shown in a 9,000 subject (Age over 50) randomized control trial in the NEJM to be about 30% more effective than Standard quadravalent vaccine
- RIV4 (45ug per dose) versus IIV4 (15ug per dose)
- RIV4 confirmed influenza cases (96 among 4427) was 2.2% versus IIV4 confirmed influenza cases (138 cases among 4301) was 3.2%, NNV=100

Case of J.R. 66 year old who presents for a Physical Exam in the Fall

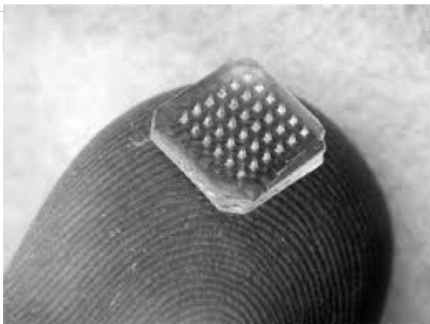


Immunizations in the future





Immunization Patch



Vaccines in development

- Zika Virus
- Norovirus
- Respiratory Syncytial Virus
- Dengue Virus

Immunization Information

- www.cdc.gov
- Immunization Hotline 1-800-232-2522
- www.immunize.org
- Needle tips publication
- Immunize Women

Which is NOT an actual ICD-10 Code

- 1) SUCKED INTO A JET ENGINE (V97.33)



- 2) BITTEN BY PARROT (W61.01)



- 3) BURN DUE TO WATER-SKIS ON FIRE (V91.07)



- ★ 4) UNSPECIFIED INJURY FROM LIONFISH (W33.01)



- ICD-9 Procedure codes 3,824 Diagnosis Codes 14,025
- ICD-10 Procedure codes 71,924 Diagnosis Codes 69,823

50% of What we learn in residency and medical school is no longer true ~~1~~ years later

NOW, IT'S 1 YEAR

50%

