Vaccines in Special Populations
Why Vaccination?

• Nietzsche- “That which does not kill us, makes us stronger”
• Kelly Clarkson- “What doesn’t kill you makes you stronger”
• Patricia Samuelson-”What does kill you, does kill you.”
Types of Increased Risk

• Increased susceptibility to infection
• Increased susceptibility to complications
Increased Susceptibility to Complications

• Liver disease-not more likely to get hepatitis A because you have an alpha one antitrypsin deficiency; but much more likely to get sick and die if you do.

• Phagocytic dysfunction (an immune deficiency)-not more prone to influenza. But it DOES increase the risk of bacterial superinfection-hence high priority for flu vaccine.
Components of the Immune System

- Innate—already present, is quick, doesn’t lead to memory (or at least not much)
- Adaptive—learns to recognize pathogens and react more strongly to future exposures. Takes time to develop.
How Do Antibodies Work?

• Neutralize pathogens-bind to them, ideally even before entry to a cell
How Do Antibodies Work?

• Facilitate opsonization-bind to a pathogen so that it can be phagocytized, pulled out of circulation, notably in the spleen
How Do Antibodies Work?

• Activate complement to lyse the pathogen, or stimulate cell mediated immunity to destroy infected cells.
The Problem With Encapsulation

Resistance to organisms with a polysaccharide capsule is heavily dependent on opsonization.

What organisms are especially prominent in this group?
Strep Pneumonia
Hemophilus Influenza
Neisseria Meningitidis
Encapsulated pathogens

• Many people have either an anatomic or functional loss of spleen
• Surgically, after trauma
• Sickle cell disease

• They are very prone to overwhelming infection and rapid death
• Need both pneumococcal vaccines, Hib, and both meningococcal vaccines.
• (also prone to babesiosis, hep c, TB, malaria, solid tumors etc but we do what we can)
Diabetic Patients

• High rates of pneumococcal disease
• High rates of hepatitis B

• Should receive PPSV 23 and hepatitis B vaccine at time of diagnosis
Neurologic Diseases

• Neuromuscular disease
  Increase susceptibility to pneumococcal disease
• Seizure disorders are included
Autoimmune Disorders

- Crohn’s Disease
- Rheumatoid Arthritis

Both increase the risk of pneumococcal disease substantially. That is in addition to the effect of immunosuppressive treatment.
Alcohol Abuse

• Patients who abuse alcohol are at increased risk for
• Pneumococcal disease
• Hepatitis A and B complications
Injection Drug Users

• Need hepatitis A and B
HIV

• Not all are immunodeficient-best to immunize before they are
• PPSV 23
• Meningitis ACWY
• Men B?
• HPV
• Hepatitis B
Therapeutic Immunosuppression

- Best time to immunize is before hand, i.e. before start of biologics for RA, when the organ transplant is first considered. Once immunosuppression has occurred live vaccines can’t be used.

- Steroid Use-live vaccines can be dangerous, others may not take
  
  Physiologic replacement is not an concern
  
  Less than 20 mg a day or every other day of prednisone or equivalent is not a contraindication to live vaccines
  
  20 mg a day for less than 2 weeks-can vaccinate right after
  
  More than 20 mg for more than 2 weeks-withhold for one month
Kidney Disease

- ESRD, Nephrotic Syndrome (directly lose IgG). Considered immune deficiency state and an indication for pneumococcal conjugate vaccine.
- Need hepatitis B
Heart Disease

• Chronic disease-need PPSV 23
• Spike in MI rate in flu season-those at risk are high priority for flu vaccine
Lung Disease

• Current Smoker
Pregnant

• High risk for complications of flu
• Vaccination in pregnancy key to prevent flu and pertussis in neonate
Travel

• CDC travel site gives information for specific areas.
• Key to find out all planned activities-cavers may need rabies vaccine for example.
Occupational

- Generally handled by employee health, needs are VERY specific.