Hepatitis B Pre and Post Vaccination Testing and Non-Response to Vaccination

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Characteristics of Hepatitis B Vaccine

• Highly immunogenic: > 95% response rate
• Excellent safety profile, few contraindications
• Can be administered to immune or HBV infected individuals w/o concern
• Reliable testing for infection and immunity available
### Serologic Tests for Hepatitis B

<table>
<thead>
<tr>
<th>Serologic Test</th>
<th>Interpretation</th>
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</thead>
<tbody>
<tr>
<td>HBsAg + HBc-AB</td>
<td><strong>Infection:</strong> acute or chronic</td>
</tr>
<tr>
<td>HBc-AB + HBs-AB</td>
<td><strong>Immunity:</strong> Natural</td>
</tr>
<tr>
<td>HBs-AB</td>
<td><strong>Immunity:</strong> Vaccine</td>
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</tbody>
</table>
Pre-Vaccination Screening

• Not Routinely Recommended

• Purpose: Identify infected and/or immune individuals

• Defer Immunization (infected and immune)

• Refer for counseling & treatment (infected)
Pre-Vaccination Serologic Testing

*Not indicated* for infant and children

- *Maybe* considered for adult/high risk

Cost effective for adult/high risk?

- Cost of vaccine
- Cost of serologic testing
- Prevalence of infection (HBc-Ab) in population
- Compliance of individuals—*always administer first dose at time of testing!*
Prevalence of HBV Infection, by Age, and Cost Effectiveness of Pre-Vaccination Testing

Percent Anti-HBc-AB

“Maybe CE”

Not CE

Age Group (Years)
Immunogenicity of hepatitis B vaccine by Age

95% of healthy young seroconvert with 3 doses!
Risk Factors for non-response to HB vaccine

- Older age
- Immunodeficiency
- Chronic Illness
- Smoking
- Obesity
Post-Vaccination Screening

• > 95% seroconvert after 3 doses
  – immune (HBs-Ab+)

• Testing 1-2 months following 3rd dose
  – False-negative test (Hbs-Ab neg) possible after 6 months

• Quantitative HBs-Ab (best, if available)
  – > 10 mIU/ml HBs-Ab
Post-Vaccination Serologic Testing

• Not Routinely Recommended

• May be considered:
  – Infant of HBsAg+ mother (infected/immune)
  – High Risk for non-response and infection
  – HCWs
Post-Vaccination Screening

Management of Infants of HBsAg+ Mothers:

- Test at 9 months of age-
  - R/O possible late infection or
  - R/O passive immunity, if administer HBIG
Post-Vaccination Screening

Management of Non-Responders:

- Test 1-2 months after 3rd dose
- May administer repeat 3 dose series –0, 1, 6 months
- Retest after completing repeat series
Management of Non-responders

• May administer an additional 3 doses on same schedule (0, 1, 6 months)

• 30% respond after 1 additional dose

• 50% respond after 3 additional doses
Persistent non-Responders

• < 5% do not develop antibody

• May be non-responder or hyporesponder”

• “May be Chronic HBV (HBsAg+); will not respond to vaccine

• If exposed, should administer HBIG (if available)
Expected Results of Post-vaccination testing

95% of healthy young seroconvert with 3 doses!
Management of Non-responders: Program Considerations

- 95% of healthy adults immune after 3 doses
- Need to test 100% to identify 5% of non-responders
- 50% of non-responders seroconvert (2.5% of total population) with 3 additional doses
- Little Potential Benefit: $95\% + 2.5\% = 97.5\%$!
END