Occupational HBV Post-Exposure Prophylaxis

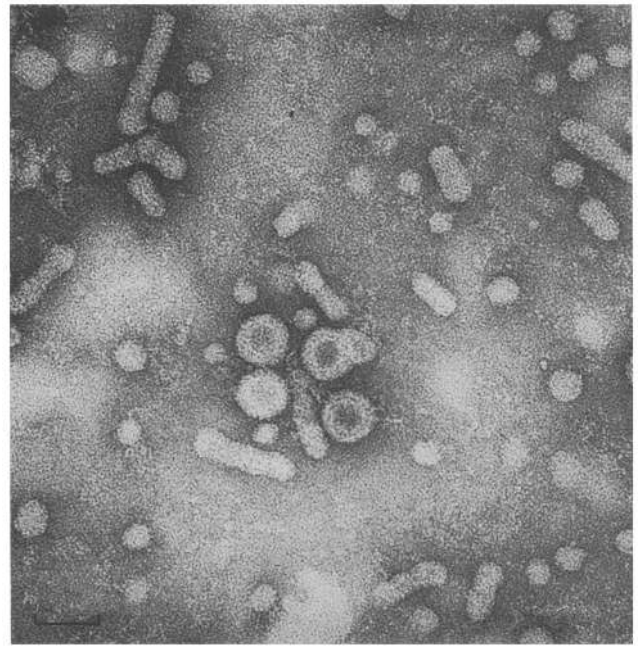
Hawai'i Hepatitis B ECHO Program
Rodolfo E Bégué, MD
JABSOM and KMCWC
November 21 st, 2022

HBV vaccine

- Based on HBsAg → anti-HBs
- 3 doses IM
- Seroconversion 95% (92%, 84%)
- Anti-HBs ≥ 10 mIU/mL → protective
- Efficacy 100%
- ~30-50% loose Abs in 10-15 years

1st yeast-based vaccine

1st VLP vaccine



HBV vaccination USA

- Introduced 1981
- Universal immunization at birth (1991)
  Catch-up immunization older children and adolescents
- Testing/immunization pregnancy
- Immunization of high-risk adults
  “Permissive” immunization for adults

Health care workers as high-risk group for HBV

- HBV Vaccination
- OSHA recommended
- Series of 3-doses *
- Check anti-HBs
- If anti-HBs ≥ 10 mIU/mL → protected (“for ever”)
- If anti-HBs < 10 mIU/mL → revaccinate with a 2nd series of 3-doses
- Recheck anti-HBs
- If still anti-HBs < 10 mIU/mL → evaluate for chronic HBV

Occupational HBV exposures

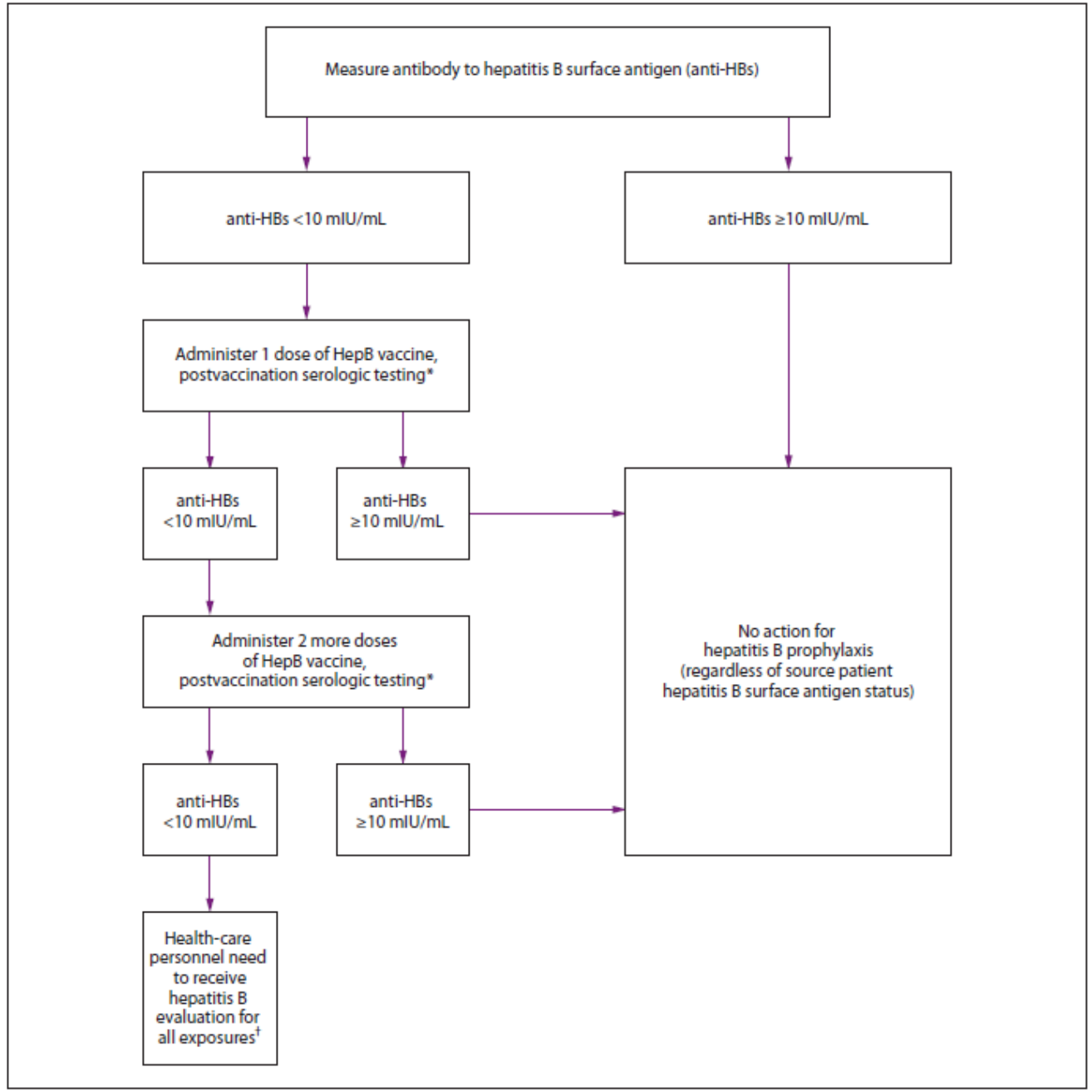
- Too many algorithms and Tables!

TABLE 3. Recommended postexposure prophylaxis for exposure to hepatitis B virus

Vaccination and antibody response status of exposed workers*	Treatment		
	Source HBsAg† positive	Source HBsAg† negative	Source unknown or not available for testing
Unvaccinated	HBIG§ x 1 and initiate HB vaccine series¶	Initiate HB vaccine series	Initiate HB vaccine series
Previously vaccinated			
Known responder**	No treatment	No treatment	No treatment
Known nonresponder††	HBIG x 1 and initiate revaccination or HBIG x 2§§	No treatment	If known high risk source, treat as if source were HBsAg positive
Antibody response unknown	Test exposed person for anti-HBs¶¶ 1. If adequate,** no treatment is necessary 2. If inadequate,†† administer HBIG x 1 and vaccine booster	No treatment	Test exposed person for anti-HBs 1. If adequate,¶ no treatment is necessary 2. If inadequate,¶ administer vaccine booster and recheck titer in 1–2 months

MMWR 2001

FIGURE 6. Pre-exposure evaluation for health-care personnel previously vaccinated with complete, ≥3-dose HepB vaccine series who have not had postvaccination serologic testing*



MMWR 2013

TABLE 2. Postexposure management of health-care personnel after occupational percutaneous and mucosal exposure to blood and body fluids, by health-care personnel HepB vaccination and response status

Health-care personnel status	Postexposure testing		Postexposure prophylaxis		Postvaccination serologic testing†
	Source patient (HBsAg)	HCP testing (anti-HBs)	HBIG*	Vaccination	
Documented responder§ after complete series (≥3 doses)	**No action needed**				
Documented nonresponder¶ after 6 doses	Positive/unknown	—**	HBIG x2 separated by 1 month	—	No
	Negative	**No action needed**			
Response unknown after 3 doses	Positive/unknown	<10mIU/mL**	HBIG x1	Initiate revaccination	Yes
	Negative	<10mIU/mL	None		
	Any result	≥10mIU/mL	**No action needed**		
Unvaccinated/incompletely vaccinated or vaccine refusers	Positive/unknown	—**	HBIG x1	Complete vaccination	Yes
	Negative	—	None	Complete vaccination	Yes

TABLE 5. Postexposure management of health care personnel after occupational percutaneous or mucosal exposure to blood or body fluids, by health care personnel HepB vaccination and response status

	Postexposure testing		Postexposure prophylaxis		
HCP status	Source patient (HBsAg)	HCP testing (anti-HBs)	HBIG	Vaccination	Postvaccination serologic testing
Documented responder after complete series			No action needed		
Documented nonresponder after two complete series	Positive/unknown	—*	HBIG x2 separated by 1 month	—	N/A
	Negative		No action needed		
Response unknown after complete series	Positive/unknown	<10 mIU/mL	HBIG x1	Initiate revaccination	Yes
	Negative	<10 mIU/mL	None	Initiate revaccination	Yes
	Any result	≥10 mIU/mL	No action needed		
Unvaccinated/incompletely vaccinated or vaccine refusers	Positive/unknown	—	HBIG x1	Complete vaccination	Yes
	Negative	—	None	Complete vaccination	Yes

MMWR 2018

Occupational HBV exposure

- ① Did an exposure occur?
- ② Is the “source” HBV infected?
- ③ Is the “recipient” immune?

① Did an exposure occur?

- Type of fluid:
  Blood and fluids contaminated with blood
  vaginal secretions, semen, CSF, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, unfixed tissue
  No risk: tears, saliva, nasal secretions, sputum, stool, urine, sweat, unless blood-contaminated
- Type of exposure:
  Percutaneous
  Broken skin
  Mucosa
  No risk: Intact skin

② Is the source HBV infected?

- Most times we don't know
- An effort should be made to test the source patient (HBsAg)
- If source is unknown or cannot be tested, assume may be positive
- Do not test discarded needles

Source	Serologic	Clinical
HBsAg(+)/HBeAg(+)	37% to 62%	22% to 31%
HBsAg(+)/HBeAg(-)	23% to 37%	1% to 6%

③ Is the recipient (HCW) immune?

- If HCW properly vaccinated (3 doses) *
  and seroresponse (≥ 10 mIU/mL) documented
- Everything is good ! (sort of …)
  nothing to do …
  (do anti-HBs → if high (≥ 10 mIU/mL) → good
  if low (< 10 mIU/mL) → give HBV vaccine x 1) *
  provide counseling to HCW

(Continues …)

Is the recipient immune? (Continuation…)

- If history of vaccination/seroresponse but no documentation
  do anti-HBs (I would do baseline HBsAg too) *
  → If anti-HBs ≥ 10 mIU/mL → immune
  all good (regardless of status of the source)
  provide counseling to HCW
  → If anti-HBS < 10 mIU/mL
  do HBsAg (if not done yet)*
  revaccinate 1-3 doses
  consider HBIG x 1 dose
  recheck ant-HBs after vaccination

Is the recipient immune? (Continuation…)

- If never vaccinated or incompletely vaccinated (0, 1 or 2 doses only) (and source unknown or HBsAg positive)
- Do not do anti-HBs (I would) *
  (I would do HBsAg) *
  HBIG x 1 dose
  Start or complete vaccination (up to 3 doses)
  Check anti-HBs 1-2 months after completing vaccination

What about HBIG?

- Consider in high-risk scenarios
- If source is HBsAg-positive or unknown
  And, HCW is:
  - unvaccinated or incompletely vaccinated (3 doses) *
  - response unknown/undocumented and anti-HBs < 10 mIU/mL
  Administer HBIG (and vaccinate)
- One more rare category:
  - documented non-responder after 2 rounds of vaccination
  → to them, give 2 doses HBIG, no vaccine needed
- After HBIG, do not check anti-HBs for at least 6 months

What about other HBV markers?

- If source is HBsAg-positive or unknown
  And HCW is anti-HBs < 10 mIU/mL
- Then, baseline do HBsAg and anti-HBc on HCW
  Repeat 6 months after exposure
- If an HCW does not seroconvert after 2 rounds of 3-HBV series test for HBsAg and anti-HBc

What about other interventions?

- No role for antivirals as postexposure prophylaxis
- HCW should refrain from blood (and other) donation for at least 6 mo
- No need to modify sexual practices or becoming pregnant
- Breast feeding can be continued
- No modification in patient-care responsibilities

The reverse situation

- Scenario: HCW is HBV-infected and cares for patients (CDC 2012, SHEA)
- No reason for discrimination
  No restriction in training or practice
  No need to inform patients about status of HCW
- Casual contact not a concern
  no restrictions for non-invasive procedures
- But, for HCW does “exposure-prone procedures”
  Expert panel oversight to “guide” practice
  monitor HBV-VL (every 6 months?)
  keep HBV-VL <1,000 IU/mL
  HCW may consider antiviral therapy
- If an exposure happens, the same protocol (reversed) would follow
- Legal (and ethical) issues may (will) arise

References

- Beltrami EM, Alvarado-Ramy F, Critchley SE, et al. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. MMWR Morb Mortal Wkly Rep 2001, vol 50, No RR-11:1-54
- Schillie S, Murphy TV, Sawyer M, et al. CDC Guidance for Evaluating Health-Care Personnel for Hepatitis B Virus Protection and for Administering Postexposure Management. MMWR Morb Mortal Wkly Rep 2013; vol 62, RR-10: 1-19
- Schillie S, Vellozzi C, Reingold A, et al. Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices. MMWR Morb Mortal Wkly Rep 2018, vol 67, No 1
- Holmberg SD, Suryaprasad A, Ward JW. Updated CDC Recommendations for the Management of Hepatitis B Virus-Infected Health-Care Providers and Students. MMWR Morb Mortal Wkly rep 2012; vol 61, No. 3: 1-12