Mongolian Emergency Service

Hospital Hygiene Project

MeshHp.mn

Hepatitis vaccination in healthcare staff and handling of virus carriers

18 June 2014, UB, Mongolia

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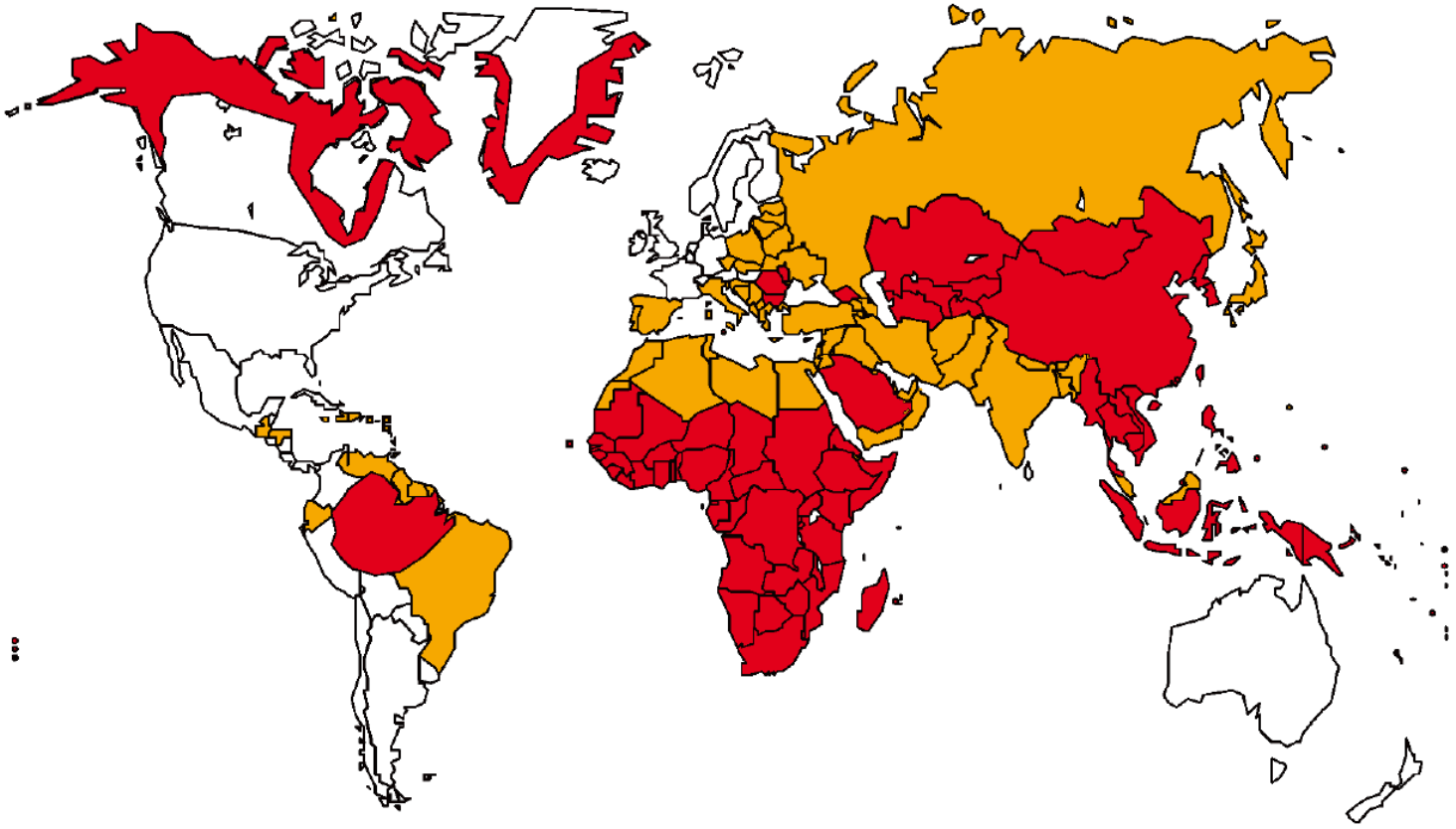
Figure 1. Geographical distribution of HBV endemicity



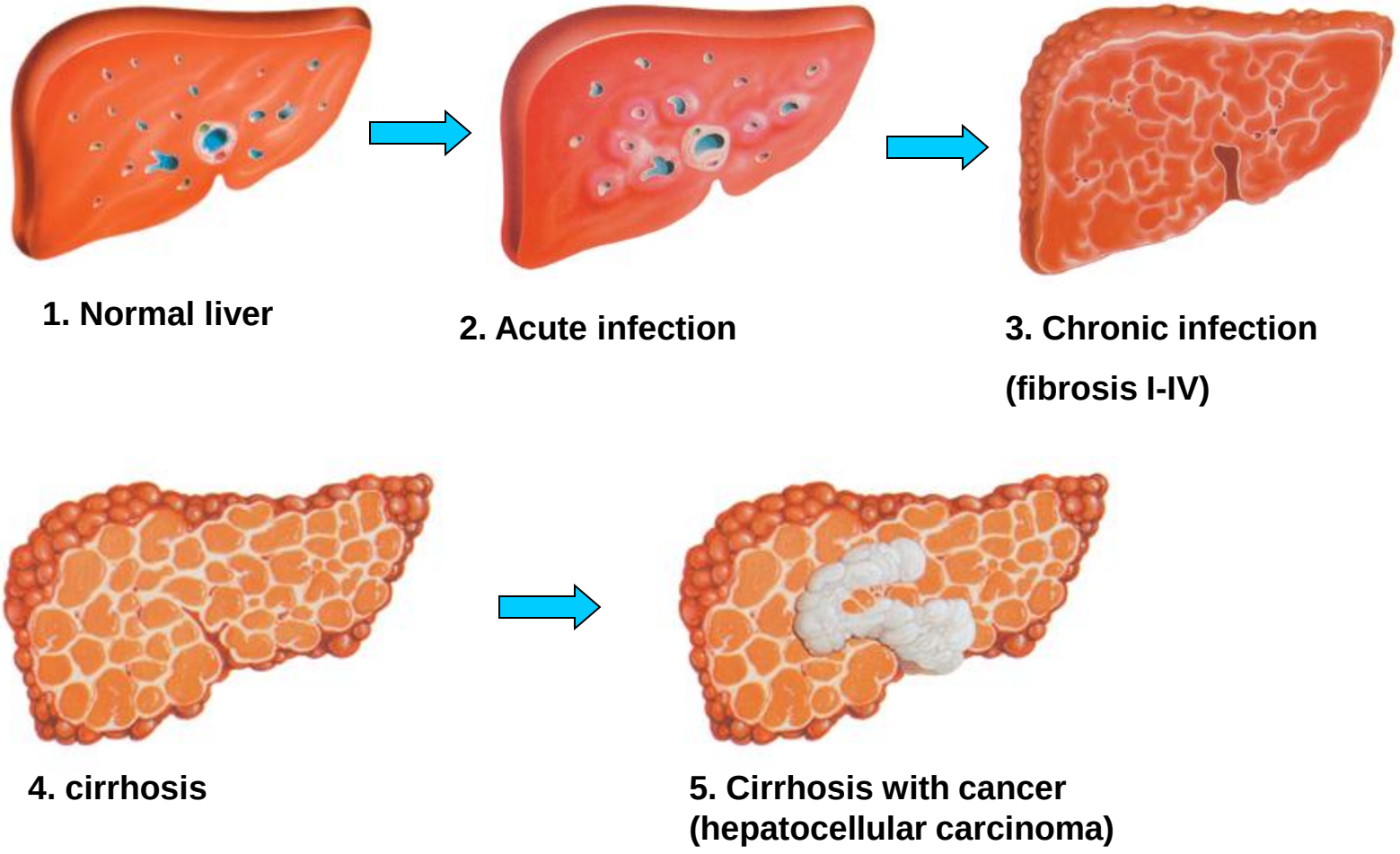
Red: High (HBsAg prevalence ≥8%
Orange: Intermediate (HBsAg prevalence 2%–7%)
White: Low (HBsAg prevalence <2%)

Source: World Health Organization. Introduction of hepatitis B vaccine into childhood immunization services. Management guidelines, including information for health workers and parents. Geneva: WHO; 2001.

Markers of Hepatitis B

HBs-AG	Anti-Hbs	Anti-Hbc	Anti-Hbc-IgM	HBV-PCR	Result
pos	neg	neg	pos	pos	Acute Infection
pos	neg	neg	neg	pos	Chronic Infection
neg	pos	neg	neg	neg	Vaccination
neg	pos	pos	neg	neg	Condition after Hepatitis B

Development of hepatocellular carcinoma (HCC)



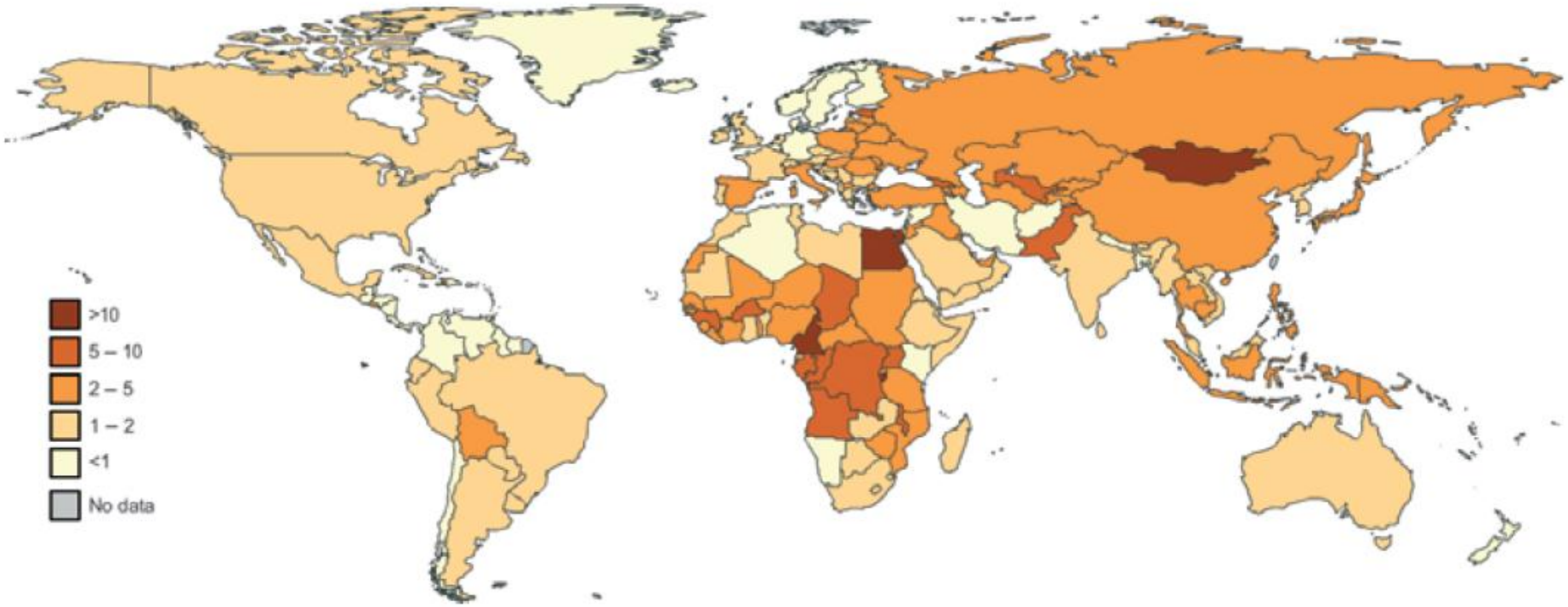


FIG. 1. Hepatitis C global prevalence 2010 (%).

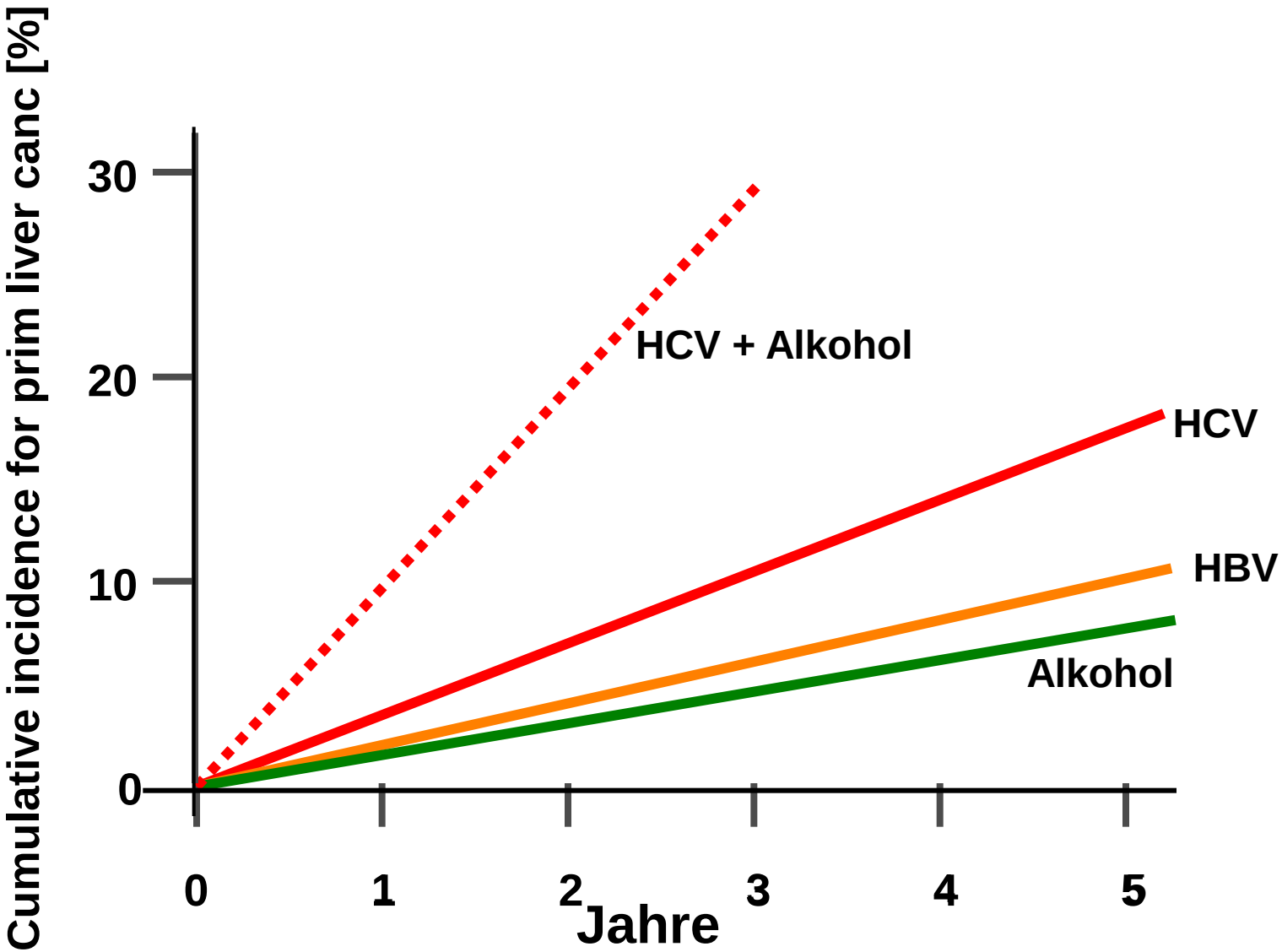
REVIEW

Evolving epidemiology of hepatitis C virus

D. Lavanchy
Interlifescience, Massagno Ticino, Switzerland

Clin Microbiol Infect 2011; **17:** 107–115

Risk for the development of liver cancer



Greten, Wedemeyer, Manns Deutsches Ärzteblatt 2006

Hepatitis B

- Vaccine against hepatitis B is available since1982

- Vaccine is 95 % effective in preventing HBV Infection

→ First vaccine against human cancer

-chronic hepatitis/cirrhosis/hepatocellular carcinoma is avoided

Hepatitis B vaccination in Mongolia

Since 1991 for all infants:

- 1st day of birth,
- 1 month of age,
- 6 months of age.

MoH order 2012 (No 432):

- HCW in public sector and medical students 2 shots with 1 month interval.

No control.

Vaccinated:

- < 10 % in 2012,
- 50 % at end of 2013.

New staff of healthcare facilities has to be vacinated.

Table 2: Results of hep B vaccination program for children in Mongolia since 1991		
	2004	**2009-2010**
n	1,145	5,894
Age (years)	7-12	4-6
HBsAg	5.2 %	0.5 %
Anti-HBc	15.6 %	
Complete hep B vaccination	60 %	82 %
Anti-HBs > 10IU/ml	17 %	
Anti-HCV	0.6 %	
Health Science University… 2011, Davaalkham et al. 2006, 2007a, b		

The risk of transmission from an infected patient to a HCW by a needlestick injury is around

30 % for hepatitis B,

3 % for hepatitis C and

0.3 % for HIV.

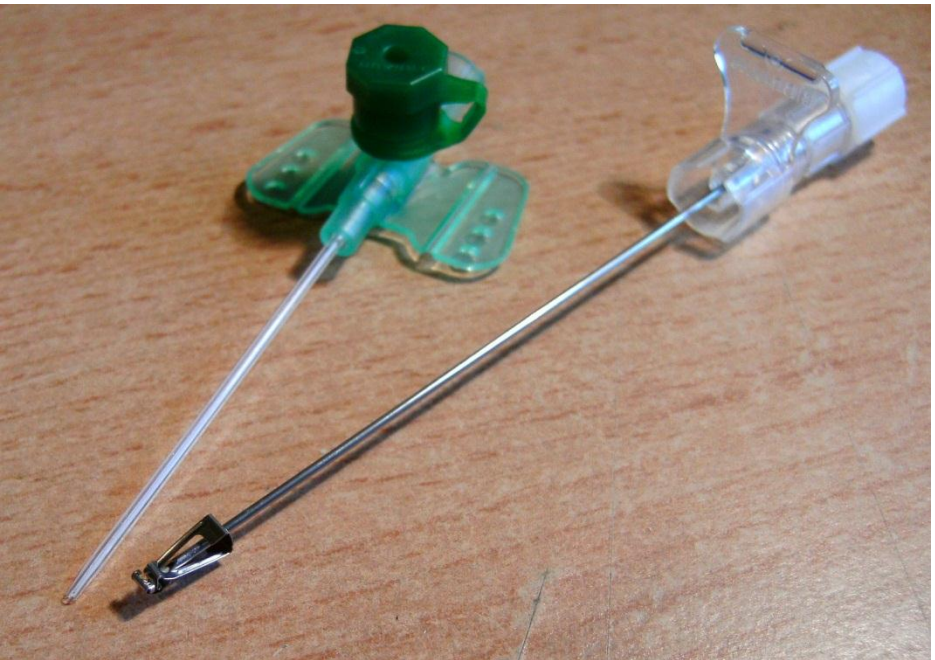
Protection

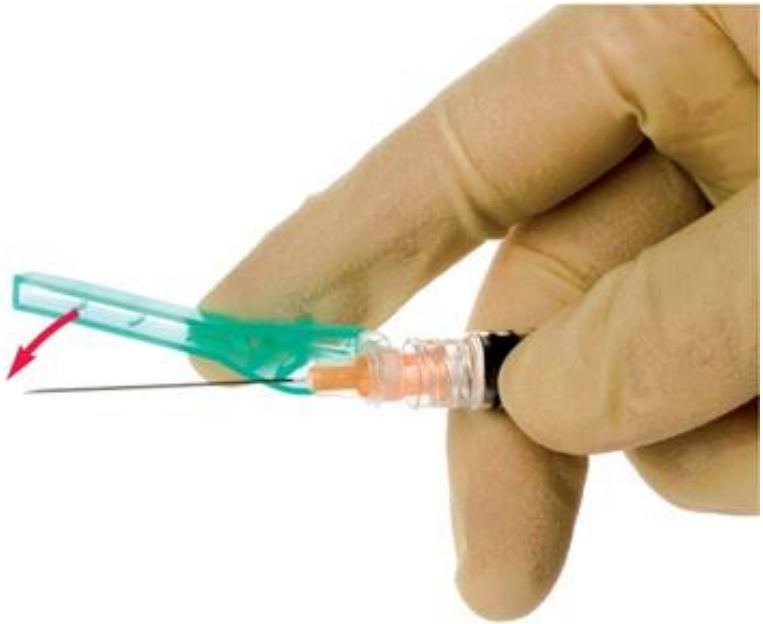
Gloves

Reduce injections

Safe sharps

Carefully handling of sharp waste





After each needlestick or sharp injury:

A co-worker should immediately be called to help.

Ideally a skin wound should be disinfected using alcohol or alcohol hand rub (use of alcohol will cause pain).
If alcohol is not available, wash extensively with soap and water.

For mucous membrane, in most cases only water douching may be realistic (alternatives: iodine, chlorhexidine or octenidin preparations).

Post exposure

Index patient negativ: no action.

Index patient HBs-Ag positive: see table.

Index patient HBs-Ag status not known: HBsAg within 48 h.

Anti-HBs in injured staff member		HB vaccine	HB immunoglobuline
> 100 IE/l		no	no
10 – 99 IE/l		Yes	No
< 10 IE/l or cannot be determined within 48 hours	Anti-HBs > 100 IE/l in former times	Yes	No
	Anti-HBs never > 100 IE/l in former times	yes	yes

Hepatitis C:

There is currently no recommended PEP.

Perform baseline and follow-up testing for anti-HCV and alanine aminotransferase (ALT) up to six months after exposure.

Perform HCV RNA at four to six weeks if earlier diagnosis of HCV infection desired.

Hepatitis C should be treated after seroconversion.

Hepatitis B vaccination – German recommendations

No necessity to test for hepatitis infection before vaccination.
But vaccination will not be successful.
Regarding the big numbers of infections in Mongolia, test might make sense because of costs.

4-8 weeks after 3rd shot Anti-HBs: ≥ 100 IE/l.

Usually no booster vaccination needed.
Eventually, in persons with high risk: control after 10 years.

Vaccinated as baby and new occupational risk:
One booster shot and control as usual.

Hepatitis B vaccination – German recommendations

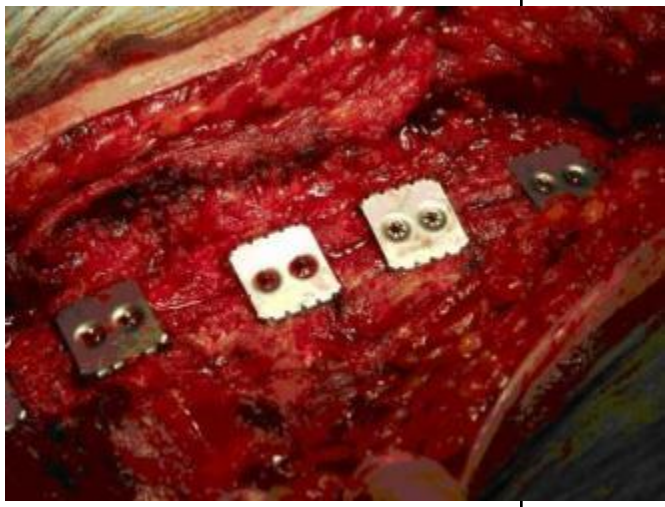
Low-responders:

- Anti-HBs: 10-99 IE/l.
- Immediately 4th shot – and test again after 4-8 weeks.
- If negative again: additional up to 2 shots – and test again 4-8 weeks after last shot.
- Different opinions if still negative after 6 shots.

Non-responders:

- Anti-HBs: < 10 IE/l.
- HBsAg and Anti-HBc to exclude chronic HBV infection.
- If not: go on like low-responders.

HCWs carrying virus in Germany
(EPP: exposure prone procedures)



Risky workplaces: surgical work in

- gynecology,
- heart and lung surgery,
- (abdominal surgery),
- oral and maxillofacial surgery.

Risky work:

- operations with narrow operation field,
- Poorly visualised operation field,
- long operations,
- fingers near to sharp and spiky instruments,
- digital palpation of a needle tip in a body cavity,
- dental operations,
- closing of sterniotomy.

SHEA Guideline for Management of Healthcare Workers Who Are Infected with Hepatitis B Virus, Hepatitis C Virus, and/or Human Immunodeficiency Virus

Category III: Procedures for which there is definite risk of bloodborne virus transmission or that have been classified previously as "exposure-prone"

- General surgery, including nephrectomy, small bowel resection, cholecystectomy, subtotal thyroidectomy other elective open abdominal surgery
- General oral surgery, including surgical extractions,[j] hard and soft tissue biopsy (if more extensive and/or having difficult access for suturing), apicoectomy, root amputation, gingivectomy, periodontal curettage, mucogingival and osseous surgery, alveoplasty or alveoectomy, and endosseous implant surgery
- Cardiothoracic surgery, including valve replacement, coronary artery bypass grafting, other bypass surgery, heart transplantation, repair of congenital heart defects, thymectomy, and open-lung biopsy
- Open extensive head and neck surgery involving bones, including oncological procedures
- Neurosurgery, including craniotomy, other intracranial procedures, and open-spine surgery
- Nonelective procedures performed in the emergency department, including open resuscitation efforts, deep suturing to arrest hemorrhage, and internal cardiac massage
- Obstetrical/gynecological surgery, including cesarean delivery, hysterectomy, forceps delivery, episiotomy, cone biopsy, and ovarian cyst removal, and other transvaginal obstetrical and gynecological procedures involving hand-guided sharps
- Orthopedic procedures, including total knee arthroplasty, total hip arthroplasty, major joint replacement surgery, open spine surgery, and open pelvic surgery
- Extensive plastic surgery, including extensive cosmetic procedures (eg, abdominoplasty and thoracoplasty)
- Transplantation surgery (except skin and corneal transplantation)
- Trauma surgery, including open head injuries, facial and jaw fracture reductions, extensive soft-tissue trauma, and ophthalmic trauma
- Interactions with patients in situations during which the risk of the patient biting the physician is significant; for example, interactions with violent patients or patients experiencing an epileptic seizure
- Any open surgical procedure with a duration of more than 3 hours, probably necessitating glove change

HCWs carrying virus in Germany

Every risky work forbidden instantly, then….

Expert commission in hospital:
At least medical director, occupational physician, hygienist, microbiologist/virologist, a surgeon, head nurse (if HCW is a nurse), administration, patient (if wanted), hepatologist, state authority.

Decision according to risky work and virus concentration.
Virus concentration control after 3 months.
Eventually therapy.
Individual decision.

Usually no action if not doing risky work.

Virus concentration (Germany)

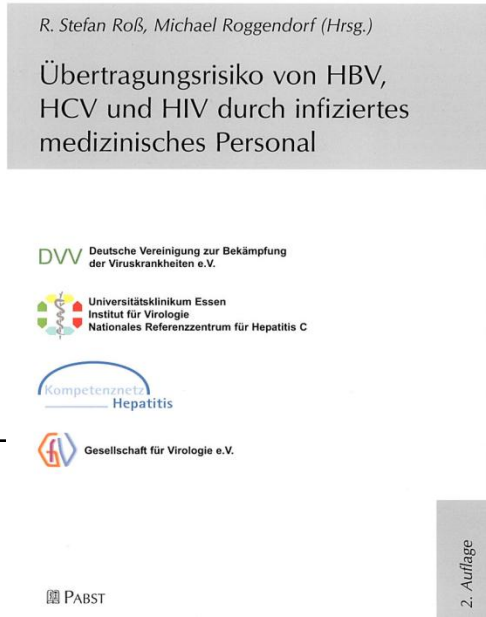
HBeAg-positive:
HBV-DNA mostly > 10^7 genome, at least > 10^5 genome equivalents/ml .

Nearly all transmissions from HCW: HBV-DNA > 10^5 genome equivalents/ml .

No action necessary if < 10^3 genome equivalents/ml – but control every 3 months.

If 10^3 - 10^5 genome equivalents/ml:
Individual decision:

- Risky work?
- Double gloves
- …



Virus concentration

Therapy will lower HBV-DNA level!

Very high lab quality necessary!!!

Hepatitis C
(European Consensus Group, 2003)

Risk of transmission much lower – transmission rate maximum 0.6 %

EPP cannot be forbidden.

If carrier:
Discussion with hepatologist about therapy.

INFECTION CONTROL AND HOSPITAL EPIDEMIOLOGY MARCH 2010, VOL. 31, NO. 3

SHEA Guideline for Management of Healthcare Workers Who Are Infected with Hepatitis B Virus, Hepatitis C Virus, and/or Human Immunodeficiency Virus

TABLE 1. Summary Recommendations for Managing Healthcare Providers Infected with Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and/or Human Immunodeficiency Virus (HIV)

Virus, circulating viral burden	Categories of clinical activities[a]	Recommendation	Testing
HBV			
$<10^4$ GE/mL	Categories I, II, and III	No restrictions[b]	Twice per year
$\geqslant 10^4$ GE/mL	Categories I and II	No restrictions[b]	NA
$\geqslant 10^4$ GE/mL	Category III	Restricted[c]	NA
HCV			
$<10^4$ GE/mL	Categories I, II, and III	No restrictions[b]	Twice per year
$\geqslant 10^4$ GE/mL	Categories I and II	No restrictions[b]	NA
$\geqslant 10^4$ GE/mL	Category III	Restricted[c]	NA
HIV			
$<5 \times 10^2$ GE/mL	Categories I, II, and III	No restrictions[b]	Twice per year
$\geqslant 5 \times 10^2$ GE/mL	Categories I and II	No restrictions[b]	NA
$\geqslant 5 \times 10^2$ GE/mL	Category III	Restricted[d]	NA

HCV in staff members (Germany)

Transmissions reported only if RNA > 10^5 IU/ml

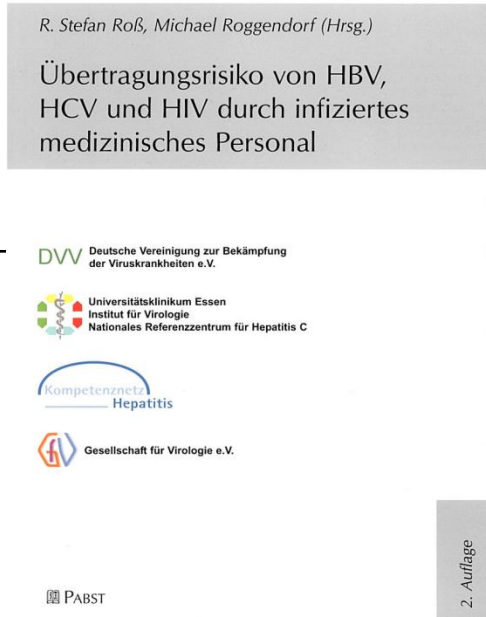
HCV-RNA < 10^3 IU/ml: no restrictions

Control every 3 months

HCV-RNA 10^3 – 10^5 IU/ml: commission makes decision

10^5 IU/ml: no risky work (EPP)

Anyway: consult hepatologist and discuss therapy.



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Thank you for your attention!