

# Rate of Seroconversion Following Hepatitis B Vaccination Among Healthcare Students: A Pilot Study

# SCHOOL OF MEDICINE

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#### ABSTRACT

Background: Requirements for proof of protective Hepatitis B virus (HBV) titers in students enrolled in health science schools alfords a unique opportunity to asses HBV serconcoversion rates. The purpose of this study is to determine the HBV serconversion rate in healthcare students at an academic institution in the Southestern United States.

Methods: This study has been approved by the Institutional Review Board. A retrospective, non-inter-ventional pilot study was conducted at the University of South Carolian to Columbia, South Carolian to Chunha, South Carolian to Chunha, South Carolian to Chunha, South Carolian the University of BiV vaccination, and HW ther results, were collected by immunization chart review. The primary endpoint is the precentage of students with positive Hepatitis Bitres (2011/L) affect associated with Hepatitis Bitres (2011/L). The review in the infatt Hepatitis Bitres (2011/L) affect associated with Beyrein and the preformed on data from students with an initial negative titer at carolinent that required HBV "boated" writes.

Results: Preliminary results from the plazmacy student cohort show 83% (259312) of students had positive titres and averaged 00 years between completion of HBV vaccination series and follow-up titer. Students with initial negative titres 17% (53312), had 10.9 years on average between last vaccination and itter. Students with initial negative titres and one documented vaccination (453) averaged 7.5 years between vaccination and initial litter, whereas students with initial negative titres and two documented (353) vaccinations averaged 13.5 years between vaccination and titer. Students were predominantly female (67.5%).

Conclusions: Increased rate of scroconversion was seen among students who completed the primary IBV scries, with less time between last HBV vaccination and titer. The rate of negative titers stresses the need for established guidelines and prudent record-keeping and follow-up for healthcare students.

## BACKGROUND

Guidelines for the immunization of health-care workers have not been updated since their release in 1997<sup>1</sup>
There are numerous Hepatitis B virus (HBV) vaccination practices among healthcare and academic health science institutions nationwide
Requirements for proof of active protection against HBV for students enrolling in health science schools allows for a unique opportunity to assess the HBV seroconversion rate among collegiate students in the US

Table 1. USC health sciences HBV vaccination requirements

USC Health Sciences	HBV Vaccination Requirements
South Carolina College of Pharmacy (SCCP)	Positive Hepatitis B titer (>10 mIU/mL) documentation OR complete a 2 <sup>sd</sup> series. If after the three doses have been received the student remains seronegative, the immunization requirement is fulfilled. Students may or may not complete entire booster series before having follow-up ther drawn, prior to first hospital rotation
University of South Carolina School of Medicine (USC-SOM)	Complete the primary vaccination series prior to beginning classes & provide positive titer results (Hepatitis B surface antibody). If the series needs to be repeated, it can be done in a four month period vs. the usual six month timing, at0, 1, and 4 months. Still a repeat titer is required.
University of South Carolina College of Nursing	Complete the Hepatitis B vaccination series prior to enrollment. Alternatively, positive titer status will suffice.

## METHODS

Retrospective, non-interventional pilot study conducted at the University of South Carolina in Columbia, South Carolina Inclusion:

All pharmacy, nursing, and medical students over 18 years of age who were enrolled between 2007 and 2011 with available immunization information

Data Collection: Baseline student demographics (age, race, gender)

Age at HBV vaccinations

Age at HBV titers

 HBV titer results (qualitative and quantitative when available)

Time in days between booster vaccination(s) and follow-up titer

#### Endpoints:

The primary endpoint will be the percentage of students with positive Hepatitis B titers ( $\geq$ 10 IU/mL) at the time of enrollment in the health science institution after receiving the primary Hepatitis B series (quantitative titer values will be assessed when available)

Secondary endpoints will include assessing the time in years between completing Hepatitis B primary vaccination series and titter results. Follow-up titter status and time in days between completing booster and follow-up titter in students who originally had a negative titer at the time of enrollment and received the required HBV booster dose/series will be evaluated.

Subject demographics and other data points collected will be assessed as predictors for seroconversion <u>Definitions:</u>

 Scroprotection against HBV infection: anti-HBs level of greater than or equal to 10 mIU/mL after receiving a complete immunization schedule.
 Qualitative vs. quantitative measures: qualitative (y/n) simply states whether the titer is seropositive or

seronegative, whereas quantitative assigns a numerical value (mIU/mL or index value) to the titer results Index Value of 1 ≥ 10 mIU/mL (relationship is nonlinear)

# OBJECTIVE

The primary objective of this study is to determine the rate of HBV seroconversion among pharmacy, nursing, and medical students at the University of South Carolina. Secondary objectives are to evaluate the secondary response of students requiring a repeat series or booster dose, and to act as a quality check of vaccination documentation at the respective schools.



Figure 2. All students with negative initial titers (n= 109)



Figure 3. All students who did not complete the primary HBV vaccination series with available initial titers (n= 27)

## 22% 22%

41%

Seropositive with 1 Vaccination Seropositive with 2 Vaccinations Seronegative with 1 Vaccination Seronegative with 2 Vaccinations

# Table 2. Baseline Demographics

PRELIMINARY RESULTS (College of Pharmacy & School of Medicine Data Presented)

<b>Baseline Characteristics</b>	Results (n=662)
Mean Age at Admission (range)	23.1 (19.4-44.7)
Race, %, (n)	
Caucasian	82.2%
African American	5.4%
Hispanic	0.8%
Asian/Pacific Islander	8.9%
Other/ Unknown	2.7%
Gender, %, (n)	
Male	40.8%
Female	59%

For all students with initial positive titers (n=540), there were 9.8 years on average between last HBV vaccination and titer For all students with initial negative titers (n=109), there were 10.8 years on average between last HBV vaccination and titer For the College of Pharmacy (n=312), the seropositive rate was 83% at time of enrollment

For the School of Medicine (n= 337), the seropositive rate was 83.3% at time of enrollment

### CONCLUSIONS

Seropositive rate of 83% among healthscience students is similar to limited published data There is an increased rate of seroconversion seen among students who completed the primary HBV series There is an increased rate of initial seropositive titers with reduced time between last HBV vaccination and ther With nearly 20% of health science students having seronegative titer, documentation and established policies are critical

### REFERENCES

 CDC. Immunization of Health-Care Workers. Recommendations of the Advisory Committee on Immunization Practices (ACIP) and the Hospital Infection Control Practices Advisory Committee (HICPAC). MMWR 1997;46(No. RR-18):1-42.

## Disclosure

Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation: None of the authors have anything to disclose in relation to this project.

# American College of Clinical Pharmacy – Virtual Poster Symposium – May 22-24, 2012