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## Practice nurses and hepatitis B : Preventative actions and their relationship to health beliefs

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# **Practice Nurses and Hepatitis B: Preventative Actions and Their Relationship to Health Beliefs.**

**By**

**Helen Le Sueur, RN. RM.**

**A Thesis Submitted in Partial Fulfilment of the Requirements for  
the Award of**

**Bachelor of Nursing with Honours**

**at the School of Nursing,  
Edith Cowan University**

**Date of Submission: February 1995**

## ABSTRACT

Hepatitis B is a major, largely undiagnosed disease in the community and nurses working in doctors' surgeries (practice nurses) undertake many clinical tasks which may expose them to the Hepatitis B virus. Using the Health Belief Model as the theoretical framework, the purpose of this correlational-descriptive study was to determine what actions are taken by practice nurses in Western Australia to protect themselves against Hepatitis B, and to what extent their health beliefs contribute to those actions.

A response rate of 59% (118) was obtained from an anonymous, confidential questionnaire sent to a random sample of 200 practice nurses in Western Australia. Data were analysed using descriptive analysis, t-tests, and one-way analysis of variance (ANOVA). Correlations using Pearson's correlation coefficient were done to discover relationships between components of the Health Belief Model.

Results showed the rate of vaccination against Hepatitis B was high (80.5%), but compliance with universal precautions, measured in this study by glove usage, appears to be based on a subjective decision and needs improvement. A high proportion of practice nurses (61.9%) had sustained occupational exposure by needlestick or splash injury, but only 54.2% of the total sample were able to nominate appropriate post-exposure actions. Although 50% of respondents reported involvement in teaching about and/or administration of the vaccine, knowledge about transmission of the Hepatitis B virus was inadequate, and specific education was not associated with higher knowledge scores.

These practice nurses believed there was only a low chance they would catch Hepatitis B, and that the disease, if caught, was moderately severe. Vaccination was significantly related ( $p < .05$ ) to teaching about and/or administering the vaccine to others, knowledge of appropriate

post-exposure actions, a low perceived barrier score, and a high belief in vaccine safety. High scores for glove usage were significantly related ( $p < .05$ ) to Hepatitis B education in the previous 2 years and longer number of years as a practice nurse. Awareness of the disease in well known others, and sustaining a dirty needlestick injury were significantly related ( $p < .05$ ) to higher perceived susceptibility. Low scores for glove usage, however, were significantly related ( $p < .05$ ) to higher perceived severity and perceived threat scores. Health beliefs about Hepatitis B appear to have contributed little to practice nurses' actions to protect themselves against the disease.

Recommendations include a targeted educational programme to include mode of transmission of the Hepatitis B virus and other bloodborne viruses, universal precautions guidelines, and a protocol for post-exposure management within a practice setting. A study of practice nurse's attitudes towards universal precautions is also advocated. Questionnaire changes are suggested for replication of the study.

## DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signed,

Date..... *22 August 1995* .....

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# CHAPTER 1

## Introduction

### Background

Hepatitis B is a major, largely undiagnosed, infectious disease in the community. The Department of Occupational Health, Safety and Welfare of Western Australia (1990) estimated that 1:1,000 Australians are infectious carriers of the disease. In Western Australia, 521 people were reported to have contracted the disease in 1994 (Epidemiology Department, Health Department of Western Australia, personal communication, January 13, 1995), and approximately 1,200 Australians are thought to die of Hepatitis B-related complications each year (Gust, 1992). Transmission is by the exchange of body fluids. This may be via sexual contact, by injection through the skin or via broken skin, or from mother to child in the perinatal period (Kedzierski, 1991; Weber & Rutala, 1989). The Centers for Disease Control, Atlanta, U.S.A. (CDC) estimate that 15-25% of health care workers will contract Hepatitis B during their career, with the individual risk "directly related to exposure to blood and other body fluids" (Pachter, 1988, p. 51). Effective vaccination will prevent the disease. Good work practices should also reduce the risk of contracting and transmitting the disease.

Nurses who work in general practice, together with their general practitioner employers, are providers of primary health care to the community. According to Sax (1990), general practice in Australia deals with between 80% to 90% of all episodes of illness. Similarly, nine out of ten health care consultations in the United Kingdom are dealt with by general practitioners or community services, and nursing services are "critically important to general practice" (Allsop, 1990, p. 7). Practice nurses, therefore, play a significant role in non-hospitalised health care. A practice population may consist of people from a wide range of socio-

economic and ethnic backgrounds and span the entire age and health continua. An individual patient's risk factors or current status regarding Hepatitis B may be unknown. Practice nurses undertake many clinical tasks which may expose an individual (nurse or patient) to the Hepatitis B virus, and therefore, are included among the groups recommended for vaccination against the Hepatitis B virus. The Department of Occupational Health, Safety and Welfare of Western Australia (DOHSA), states that:

A vaccination protocol should form part of a policy for prevention and control of infectious disease for the workplace. Where workers have a definite identified increased risk of contracting Hepatitis B through their work, the employer has a responsibility to provide vaccination (1990, p. 5).

In Australia, practice nurses are employed directly by a medical or surgical practitioner (or group of practitioners) in private practice. Unlike most nurses in hospitals and community health areas, practice nurses do not have a common employer and work in relative professional isolation. There is an assumption, by employers and patients, that the knowledge and work practices of their nurses are appropriate. The employment status of practice nurses, however, means they have little access to "in-service" type training such as that available to nurses employed within governmental and private institutions. Le Sueur and Barnard (1993) found that 80% of practice nurses in Western Australia qualified more than 10 years ago, that 57.6% have worked as practice nurses for longer than 5 years and that 80% work part-time. Although 90.7% felt there was a need for ongoing education, only 64.5% had attended at least one study day or seminar. An implication of this is that post-basic education may not be seen as a priority and, therefore, knowledge and practice of appropriate nursing measures for bloodborne

pathogenic diseases may be inadequate. Anecdotal evidence suggested, moreover, that vaccination or other protection against Hepatitis B among practice nurses may not be given a high priority by nurses or their employers. For example, none of five practice nurses observed by Le Sueur and Barnard (1993) used gloves for any procedure seen by the observers. Gloves were not always worn, even for cleaning tasks, such as cleaning used surgical instruments (not stated in report). This indicates that the key concept of "universal precautions", that is, the assumption that the blood and body fluids of all patients may be infected, has not been embraced by at least some practice nurses. While there is no Medicare reimbursement for nursing services in general practice, employers may be reluctant to provide training or to pay education and training costs, particularly in the case of smaller practices with no obligations under the Training Guarantee Levy.

Most studies on vaccination against the Hepatitis B virus among health care workers have concentrated on hospital-based and dental workers. However, Marles (1993) found, in a study of 102 practice nurses in Torbay (U.K.), that 85% of respondents had completed a course of vaccination against Hepatitis B. Prior to this current study, data were not available regarding vaccination rates or actions undertaken by practice nurses in Western Australia to protect themselves against Hepatitis B.

### **Significance of this Study**

Hepatitis B is a major preventable illness in the community. In the healthcare setting, Hepatitis B is transmitted predominantly by needlestick injury (Cooper, 1993). Elsewhere, lifestyle choices such as needle-sharing by intravenous drug users, and unsafe sexual practices are common modes of transmission of the disease (Gust, 1992; Hallan &

Kerlin, 1991). The short-term and long-term consequences of infection with the Hepatitis B virus may have a substantial effect on an individual's health and employment prospects. The health status and work practices of an individual nurse, therefore, will have a significant impact on the health and well-being of the nurse, her (or his) patients and colleagues, and the practice itself through its legal liability. However, there was no previous information available about vaccination rates against Hepatitis B among practice nurses in Western Australia, or about measures they undertake to protect themselves against Hepatitis B or other bloodborne pathogens. This study determined the extent of vaccination among practice nurse in Western Australia. It also identified gaps in the knowledge, and application of that knowledge, about the prevention and transmission of Hepatitis B among practice nurses in Western Australia as a basis for a health promotion campaign directed at providers of non-hospitalised health care in the private sector.

### **Purpose of Study**

The purpose of this study was to determine what actions are taken by practice nurses in Western Australia to protect themselves against Hepatitis B infection, and to what extent their health beliefs about the disease contribute to those actions.

### **Research Questions**

1. What is the extent of knowledge about Hepatitis B transmission among practice nurses in Western Australia?
2. What proportion of practice nurses have sustained a needlestick injury during their working life?



3. To what extent are health beliefs about Hepatitis B related to whether practice nurses are effectively vaccinated against the disease?

4. To what extent are health beliefs about Hepatitis B related to whether practice nurses use Universal Precautions in their workplace?

### **Definition of Terms**

**Practice nurse:** A registered nurse holding a current practising certificate, who is in the direct employ of a medical or surgical practitioner in private general or specialist practice.

**General practice:** "The provision of primary continuing comprehensive whole-patient care to individuals, families and their communities" (National Health Strategy, 1992, p. 33).

**Specialist practice:** The provision of medical or surgical care to individuals by a practitioner with advanced clinical training and qualifications in a particular speciality.

**Private practice:** A medical practice owned and operated by one or more medical or surgical practitioners as a private business.

**Clinical tasks:** All tasks directly associated with patient care performed by practice nurses. Tasks which may expose the nurse to Hepatitis B infection include giving injections, venipuncture, finger prick blood testing, cleaning and dressing open wounds, performing Papanicolaou smears, assisting with minor operative procedures, cleaning surgical instruments, and handling pathology specimens.

**Hepatitis B:** Hepatitis B is an infectious disease caused by the Hepatitis B virus which belongs to the deoxyribonucleic acid (DNA) group of viruses and, like other hepatitis viruses, attacks the liver. Chronic infection may result from the ability of the virus to persist in infected cells. The DNA group of viruses has also been implicated in the development of some cancers (Kedzierski, 1991). The Hepatitis B virus

is found in most body fluids, particularly blood. "Transmission of bloodborne infection requires an infectious source, a susceptible host and the transfer of a sufficient dose of the infectious agent through the protective defences (skin or mucous membrane) of the susceptible host" (Hu, Kane, & Heymann, 1991, p. 623). In general practice the most common occupational exposure is by needlestick injury. Risk factors for acquiring Hepatitis B infection are similar to those for Human Immunodeficiency virus (HIV) and Hepatitis C, but the Hepatitis B virus is up to 30 times more contagious than HIV (DOHSWA, 1990). The incubation period may be up to six months.

**Effective vaccination against Hepatitis B:** A three-dose schedule of intramuscular injection of Hepatitis B vaccine into the deltoid muscle (upper arm) followed by a blood test to confirm presence of sufficient antibody concentration to confer immunity against the disease (seroconversion) is required. Five to ten percent of vaccinees will not develop immunity (DOHSWA, 1990).

**Parenteral route:** Fluid forced into the body by injection into a muscle, vein, or under the skin, by a cut with a sharp instrument resulting in bleeding, or by assimilation through broken skin.

**Occupational exposure:** Exposure in the workplace to blood or body fluid via the parenteral route (needlestick, puncture wound or cut with sharp instrument resulting in bleeding), or contamination of broken skin or mucous membrane via splash in eye or mouth (Bowden, Pollett, Birrell & Dax, 1993).

**Universal precautions:** "[Measures] intended to prevent parenteral, mucous membrane, and non-intact [broken] skin exposures of health-care workers to bloodborne pathogens" (CDC Update, 1990, p. 1584). These include the appropriate use of barrier precautions such as gloves, gowns, masks and protective goggles when it may be

reasonably anticipated that contact with blood or other body fluid may occur. Other measures include hand washing and the safe handling, and disposal of sharp objects.

**Health beliefs:** A set of subjective perceptions an individual holds about a particular aspect of health (in this study, Hepatitis B). These beliefs are inter-related and help determine the individual's health behaviours. Beliefs include the perception of personal susceptibility to the disease, the perception of the severity or seriousness and consequences of the disease, and the perception of the benefits and barriers attached to particular health behaviours (Gross & Bonwich, 1982; McAllister, 1992).

**Health behaviour:** "An action taken by a person to maintain, attain, or regain good health and to prevent illness. Health behaviour reflects a person's health beliefs" (Mosby's medical, nursing, & allied health dictionary, 1990, 546).

**Benefits:** expected positive outcomes to a proposed health behaviour, for example, protection from a disease by vaccination.

**Barriers:** perceived obstacles to a proposed health behaviour, for example, monetary cost of vaccination.

### **Organisation of Thesis**

This introductory chapter provided the background to and the significance of the study. The second chapter reviews the literature concerned with transmission of Hepatitis B and means of protection against the disease. Also reviewed are studies dealing with nurses' knowledge about Hepatitis B and its transmission, and their compliance with preventative measures. The theoretical framework is described in the third chapter. The fourth chapter presents the sample, design and data collection instrument used in this study. The procedure and data

analysis are also described. The fifth chapter presents the findings. In chapter six, the findings and their importance are discussed. Limitations of the study are also discussed in this chapter. The final chapter draws conclusions from the findings and discusses the implications these may have for practice nurses. Recommendations for further study are also suggested.

## **CHAPTER 2**

### **Literature Review**

Practice nurses are at risk of occupational exposure to the Hepatitis B virus, as are nurses in other areas of practice. However, although literature on occupational exposure to Hepatitis B and other bloodborne pathogens is plentiful, much of the research focuses on dental or operating room staff who work in acknowledged high-risk areas. Despite an extensive search in English language literature on Hepatitis B, only one English study pertaining to practice nurses as a group was found (Marles, 1993). No studies were found examining protection against Hepatitis B among Australian practice nurses. This review will cover the prevalence of Hepatitis B among health care workers, compliance with preventative measures and the level of nurses' knowledge about the disease.

#### **Prevalence of Hepatitis B in Health Care Workers**

According to the Department of Occupational Health, Safety and Welfare of Western Australia (1990), one in 1,000 Australians is an infectious carrier of the Hepatitis B virus. Health care workers, therefore, are at risk of contracting Hepatitis B through occupational exposure, with needlestick injury the most common mode of transmission (Bowden et al., 1993; Cooper, 1993). It is estimated that between 6-30% of individuals with a needlestick injury from a Hepatitis B surface antigen (HBsAg) positive patient will become infected (Bowden et al., 1993; Gardner, 1991; Hu et al., 1991; Kedzierski, 1991), although no reasons are given for this huge variation. However, after analysis of 51 health care workers with Hepatitis B (over a period of 7 years) and 50 consecutive non-medical workers with fulminant hepatic failure or acute Hepatitis B who were admitted to King's College Hospital (U.K.),

Callender, White and Williams (1982) suggested that the disease "may be acquired by contact with infected blood without specific inoculation injury" (p.326). They found that whereas the source of infection was apparent in 32 of the 50 non-medical workers, only 15 of the 51 health care workers had a history of direct occupational exposure, and that only 3 of these could recall a specific inoculation injury. The Hepatitis B virus has been shown to be relatively stable, surviving in dried blood for at least seven days, and indirect transmission by blood contaminated instruments and environmental surfaces has been reported (Grau, 1991; Hu et al., 1991; Ilott, 1990; Weber & Rutala, 1989). Viral transmission has also been linked to poor aseptic technique during phlebotomy, where a non-carrier phlebotomist acted as a vehicle for transmission (HBV outbreak, 1993).

According to Thomas et al. (1993), health care workers comprise between 2% and 8% of all reported cases of Hepatitis B in the U.S.A. An early study by Dienstag and Ryan (1982) of 624 hospital employees found that 30% of Emergency Department nurses and 37% of pathology staff had evidence of past Hepatitis B. By comparison, after a decade of vaccine availability (since 1982), Thomas et al. (1993) found that only 6.2% of 943 anonymously tested health care workers at The Johns Hopkins Hospital, Maryland, displayed evidence of past infection, while 77.2% had been vaccinated against the Hepatitis B virus. In their study, only absence of vaccination was independently associated with infection. The rate of Hepatitis B among these health care workers (6.2%) was, however, much higher than the seroprevalence of 1.8% among local blood donors. A retrospective study by Polish, Tong, Co, Coleman, and Alter (1993) of serum samples collected in 1983 from 1677 hospital employees during a pre-Hepatitis B vaccination programme showed a seroprevalence, at that time, of 14.4% for Hepatitis B. They found that

Hepatitis B was associated with a history of hepatitis, blood transfusion and needlestick injury. However, this result may not reflect the current picture at the hospital. The serum samples were 10 years old and staff changes have undoubtedly occurred in that time. Changes to the Hepatitis B status of individuals may also have occurred. The study was also limited by its setting of a single private hospital in middle class southern California, but the authors did not attempt to generalise their results to other populations. Unlike the study by Thomas et al. (1993), Polish et al. (1993) did not collect information concerning the use of injectable drugs or sexual activity which might have influenced the findings. Although Hepatitis C was a focus of these two studies, only findings relevant to Hepatitis B have been reviewed here.

Although the risk of transmission to their patients appears to be low, HBsAg positive health care workers have occasionally been implicated in multiple transmissions (Callender et al., 1982; Hospital suspends surgeon, 1993; Weber & Rutala, 1989). As the number of people with bloodborne diseases increases in the community, health care workers who are HBsAg negative must take preventative action against acquiring these diseases. Vaccination against the Hepatitis B virus and compliance with universal precautions guidelines currently offer the most effective methods of achieving this aim.

### **Protection Against Hepatitis B**

Vaccination via the recommended intramuscular route provides a safe and effective means of protection against Hepatitis B and its sequelae (Gust, 1992; Hu et al., 1991). Vaccines are of two types: a) plasma derived, produced from non-infectious HBsAg particles from the plasma of chronically infected individuals, and b) recombinant DNA vaccine, a synthetic yeast derived vaccine (Hallam & Kerlin, 1991;

Trevelyan, 1991). New guidelines issued by the Department of Health (U.K.) in August 1993, require all surgical staff to be immunised against Hepatitis B and all carriers to be banned from participation in surgical procedures (Hospital suspends surgeon, 1993).

Under universal precautions guidelines the blood and body fluids of all patients are considered potentially infective (Burtis & Evangelisti, 1992; CDC Update, 1990). Practice nurses' compliance with these guidelines will reduce the risk of infection with the Hepatitis B virus and other bloodborne pathogens during routine activities.

### **Compliance with Preventative Measures**

#### **Vaccination against Hepatitis B.**

Despite availability of vaccine and their at-risk status, nurses' acceptance of Hepatitis B vaccination has not generally been high. Surveys in the United Kingdom (35% - 58%), Germany (44%) and Spain (58%) found that many nurses had not been vaccinated, although, in Belgium 90% of nurses were vaccinated against Hepatitis B (Trevelyan, 1991). A random sample of 100 nurses and 100 medical staff at the University Hospital of South Manchester, U.K. tested by Burden and Whorwell (1991) found only 16% of nurses and 31% of doctors effectively vaccinated with a further 9% (nurses) and 18% (doctors) vaccinated but not tested for seroconversion.

Even where staff vaccination programs are established acceptance may be low. Despite four years of free vaccine availability, only 42% of 169 high-risk registered nurses at Hahnemann University Hospital, U.S.A. (50.6% of sample) were vaccinated against Hepatitis B (Spence & Dash, 1990). Similar results were found by McKenzie (1992), who had a 52% response rate to an anonymous, self-administered questionnaire sent to high-risk health care workers at a large American metropolitan



hospital. They found that 55% of the 480 respondents were vaccinated against Hepatitis B. An antibody titre had been measured in 64% of vaccinated respondents. These studies were limited by their low response rates, their single sampling sites and lack of reliability and validity figures for instruments used. However, similar findings have been found in larger studies.

In a multi-stage stratified random national survey of 3094 American health care workers (70% of the sample), Hersey and Martin (1994) found only 42% of patient care staff and 45% of physicians had completed the series of three injections. However, the survey did not ask if respondents had had a blood test to confirm immunity to the Hepatitis B virus.

Vaccinated (and partly vaccinated) patient care staff were significantly more likely to believe that Hepatitis B was a risk for hospital staff and a concern for themselves than were non-vaccinated staff. Non-vaccinated staff were significantly more likely than vaccinated staff to believe that Hepatitis B vaccine could make people ill. Briggs and Thomas (1994), in an anonymous self-administered survey of 462 high-risk health care workers in the Croydon (South London) health district, found that 71.9% of 300 respondents believed their job to be high-risk if not vaccinated. At the time of the survey, one year after a staff vaccination programme, 67.3% had been vaccinated. Almost all (96.2%) viewed the consequences of infection as serious and 82.8% believed the vaccine to be effective. A large majority of non-vaccinated respondents in at least two studies wished to be immunised (Burden & Whorwell, 1991; Briggs & Thomas, 1994).

Barriers to vaccination were identified by several authors. These included fear of serious side effects (Burden & Whorwell, 1991; Grau, 1991; Hersey & Martin, 1994; McKenzie, 1992; Pachter, 1988; Spence & Dash, 1990); fear of AIDS and/or Hepatitis B from the vaccine

(Follett, Symington & Cameron, 1987; Pachter, 1988; Spence & Dash, 1990); motivational factors (Briggs & Thomas, 1994; Burden & Whorwell, 1991; Spence & Dash, 1990); availability and accessibility of vaccine (Burden & Whorwell, 1991; McKenzie, 1992; Spence & Dash, 1990); underestimation of personal risk (Burden & Whorwell, 1991; Grau, 1991; McKenzie, 1992; Spence & Dash, 1990); cost of vaccine (Follett et al., 1987; Grau, 1991; Pachter, 1988); and fears about vaccine effectiveness (Spence & Dash, 1990).

Reliability and validity data were not available for most of these reviewed studies, and confidentiality of data was rarely mentioned.

The 62 item Hepatitis B Vaccination Acceptance Questionnaire, using the Health Belief Model as a construct and including Locus of Control scales, was developed by Bodenheimer, Fulton and Kramer (1986) and used to interview a risk-stratified sample of 1500 Rhode Island Hospital employees to assess acceptance of (intention to receive) Hepatitis B vaccine. Eight scales were formed from the responses to individual questions. According to the authors, the reliability of the locus of control scales "closely matched results reported in the literature" (Bodenheimer et al., 1986, p. 252). Co-efficient alpha ranges for the other scales were: 0.52 for knowledge of Hepatitis B, 0.49 for susceptibility to Hepatitis B, 0.77 for severity of the disease, 0.69 for safety and effectiveness of the vaccine, and 0.82 for discomfort of vaccine. They found that beliefs about vaccine safety and effectiveness had the greatest effect on vaccine acceptance. Those who thought the vaccine was safe and effective and those who had high scores of perceived susceptibility to and seriousness of Hepatitis B virus were more likely to receive free vaccination from the hospital. Using a modified version of the previous questionnaire, Fulton, Bodenheimer and Kramer (1986) re-interviewed a random sample of 199 subjects after a hospital education and vaccination programme and found

that although educational seminars increased the perceived severity of Hepatitis B, approximately half the respondents had changed their minds about accepting or rejecting vaccination (37% were less likely to be vaccinated, 13% more likely to be vaccinated). The authors reported actual acceptance of the vaccine by only 26.9% of respondents. However, the vaccination programme was undertaken at a time when AIDS was receiving a lot of media attention, but before the causal virus had been identified, and data verifying vaccine safety was not available.

Similarly, chart audit following an extensive targeted promotion showed an overall increase in vaccination acceptance of 13.6% (taking the overall coverage to 54.7%) of high-risk health care workers at the Health Science Centre, Winnipeg, Manitoba (Yassi, Khokhar, Marceniuk, and McGill, 1993).

In contrast, using an adaptation of Bodenheimer's Hepatitis B Vaccination Acceptance Questionnaire, Mundt (1992) found 77% of the 92 respondents (47% of a convenience sample of 197 registered nurse members of the AAOHN hospital/medical centre specialty group) had been vaccinated against Hepatitis B. Validity and reliability measures used by Bodenheimer were accepted by Mundt despite minor changes to demographic questions and the addition of a question about needlestick injury. Mundt found younger occupational health nurses and those with less experience were likely to feel more susceptible to Hepatitis B and to have had the vaccine. In common with other studies (Bodenheimer et al., 1986; Briggs & Thomas, 1994; Hersey & Martin, 1994) Mundt found a significant positive relationship between perceived susceptibility to infection and vaccine acceptance. However, while Bodenheimer et al. (1986), found a positive relationship between perceived severity of the disease and vaccine acceptance, Mundt did not. As with other studies (Burden & Whorwell, 1991; Grau, 1991; McKenzie, 1992; Spence & Dash,

1990) non-vaccinated nurses perceived their job as "low-risk". Perceived threat was determined by the combination of scores for perceived susceptibility and severity, but did not predict acceptance of Hepatitis B vaccine. Barriers of cost and/or vaccine method (injection or tablet) were negatively correlated with nursing education, but did not significantly affect vaccine acceptance, and knowledge level about Hepatitis B also did not predict acceptance of the Hepatitis B vaccine. In contrast to some other studies, concerns for safety and effectiveness of the vaccine were not found by Mundt—perhaps because recombinant vaccine was more widely used than plasma derived vaccine by the time of this study.

deVries and Cossart (1994), also found high rates of vaccination against Hepatitis B among clinical staff at Royal Prince Alfred Hospital (79% Emergency Department staff, 85% ward nurses) and almost universal vaccination among final year medical (98%) and dental (95%) students at Sydney University.

Although claiming that evidence had not shown that general practitioners were at a greater risk than the general public, Kinnersley (1990) found that 88% of 598 respondents to a mailed survey of general practitioners in Lancashire (U.K.) thought all general practitioners should be vaccinated, yet only 48% had completed or commenced the vaccination schedule. In contrast, although limited by a small sample and a single health district, Marles' (1993) survey of 102 practice nurses in Torbay, (U.K.) found 85% of the 83 respondents were vaccinated and suggested that practice nurses involvement with vaccination programs for patients gave them more awareness of their own need for immunisation. These studies were limited by their single district sampling methods. Validation and reliability of the questionnaires were not discussed and confidentiality was not mentioned in either study.

### **Use of universal precautions.**

Occupational transmission of the Hepatitis B virus and HIV in general practice is considered to be low (Cooper, 1993), although Ilott (1990) argued that a predicted increase in general practitioner services offered (in the U.K.) would lead to an increased risk from bloodborne diseases for nurses in general practice and that greater knowledge of infection control measures was needed in this area. Grady, Shortridge, Davis and Klinger (1993) emphasised the need for compliance with universal precautions guidelines as the number of people infected with bloodborne diseases increases. Practice oriented protocols and post-exposure management protocols should be readily available in every practice (Cooper, 1993; Gardner, 1991; McCormick, Meisch, Ircink & Maki, 1991) although poor compliance with post-exposure guidelines was found by McKenzie (1992).

In a mailed questionnaire to a sample of 2,963 certified nurse midwives (a high-risk group), Willy, Dhillon, Loewen, Welsey and Henderson (1990) found 55% of 1,784 respondents reported using universal precautions. However, most did not practice every component of those precautions. Moreover, 10% said they were unaware of universal precautions and 40% of those who did not use them perceived universal precautions as unnecessary. Just 37% of those claiming to use universal precautions reported never recapping needles and 24% of all respondents had experienced at least one needlestick in the previous six months. Needle recapping was found to be associated with needlestick injury. Nurses who complied with universal precautions were more likely to perceive themselves at risk of Hepatitis B or HIV infection and had a greater knowledge score on transmission routes. However, as midwives try to minimise artificial barriers between their patients and themselves,

the authors suggest that these findings may be applicable only to health care workers with similar concerns about patient psychology.

A study based on Health Belief Model constructs by Grady et al. (1993) using a convenience sample of 100 registered nurses (100% response) from a large metropolitan hospital in mid-western U.S. with a low prevalence of bloodborne diseases found that nurses who had cared for patients with acquired immunodeficiency syndrome (AIDS) had a significantly higher perception of susceptibility and near significant perception of seriousness than nurses who had not cared for AIDS patients. However, nurses who cared for patients with bloodborne disease (including AIDS) also showed significantly lower motivation to adopt preventative health behaviour strategies. Thus, perceived susceptibility to infection did not correlate with compliance with universal precautions guidelines. Content and construct validity were discussed and were acceptable. Limitations of a small non-representative sample were recognised by the authors.

Non-compliance with preventative measures may be due to inadequate education or understanding of guidelines, an unrealistic perception of personal risk, or a lack of engineering or administrative controls such as the provision of suitable sharps containers or protective equipment (Dajczman, Dascal, Orenstein & Frank, 1992; Gardner, 1991). Poor compliance with universal precautions may include inappropriate use of barrier devices such as gloves, inappropriate disposal of needles and syringes including needle-recapping, or non-compliance with hand-washing guidelines, and may lead to occupational exposure such as splash or needlestick injury (Dajczman et al., 1992; Dalton et al., 1992; Linden, 1991; McCormick et al., 1991; McKeown, 1992). Poor aseptic technique was linked to Hepatitis B outbreaks in Ohio (HBV outbreak, 1993) and France (Ilott, 1990). Bowden et al. (1993) identified "butterfly"

needles and lancets as high-risk items. These items are used fairly routinely by many practice nurses in venipuncture and glucose blood monitoring.

In an anonymous survey, deVries and Cossart (1994) examined needlestick injuries in final year medical and dental students at Sydney University, and ward and Emergency Department nurses and doctors at Royal Prince Alfred Hospital, Sydney. Despite response rates of between 92% (medical students) and 41% (Emergency Department doctors), they found that 22% of 138 final year medical students, 72% of 39 final year dental students, 50% of 27 ward nurses, 71% of 51 ward doctors, and 51% of Emergency Department staff (21 nurses and 7 doctors) had sustained 1 or more contaminated penetrating sharps injuries during their course (students) or the previous 2 years (staff). They also found only a minority of injuries were reported to the infection control unit and that reporting was selective on the basis of "presumed risk" (p. 400). deVries and Cossart also concluded that concerns about confidentiality of data when baseline serology was performed, and the belief that "intervention will not affect the outcome" (p. 399) contributed to under-reporting of injuries.

High rates of needlestick injury among respondents were also reported by other authors: Burden and Whorwell, 1991 (57% of nurses and 87% of doctors); Grady et al., 1993 (63% of nurses); Marles, 1993 (48% of practice nurses); Spence and Dash, 1990 (81% vaccinated nurses and 73% non-vaccinated nurses); and Troya, Jackson, Lovrich-Kerr, & McPherson, 1991 (33% of nurses). These last researchers found that vaccination was commenced post exposure by 41% of vaccinated nurses. Needlesticks (25% during recapping) caused 72% of the percutaneous exposures admitted to by 52% of 3094 patient care staff (Hersey & Martin, 1994). Many exposures were not reported to the employer (Burden & Whorwell, 1991; Hersey & Martin, 1994; Spence & Dash,

1990), but vaccinated nurses were more likely to report an exposure than non-vaccinated nurses (McKenzie, 1992; Spence & Dash, 1990).

Recapping needles with a two-handed method continues to be a high source of percutaneous injuries to health care workers. Hersey and Martin (1994) reported that 55% of patient care staff recapped at least sometimes, with 45% sometimes recapping after drawing blood. Only 43% always used gloves to draw blood.

Over a 3 year period (1991-1994) 1,222 sharps injuries (including 1,019 needlesticks in health care workers) in Western Australia were investigated by Rich and Vickery (1994). Only 3% of recipients were not health care workers. Statistics were compared from one 148 bed acute tertiary facility and from non-hospital health care workers. They found that outside the hospital environment, the "sharps protocol" of screening blood tests on donor and recipient to determine the need for prophylaxis against Hepatitis B and/or HIV was rarely achieved. In only 13% (91) of 659 cases were both the non-hospital health care worker and the donor investigated, compared with 66% (281) of 425 hospital staff. Further, whereas 72% (305) of hospital staff tested were immune to Hepatitis B, only 41% (269) of other health care workers were immune. Post-exposure screening detected 2 carriers among immune recipients, but it was not stated in which group they were found. There was also no mention of any recipient developing Hepatitis B after exposure. Rich and Vickery (1994) concluded there was an urgent need for an education programme in clinics and medical practices. (See Appendix A for a copy of Dr. Rich's letter giving permission to use these data.)

Only four of the reviewed studies looked at the projected outcome of the use of vaccination and universal precautions. Follett et al. (1987) reported that no vaccinated staff member had shown clinical evidence of Hepatitis B infection since the start of a staff vaccination programme at



Lennox Castle Hospital (for the mentally handicapped), Glasgow, U.K. McCormick et al. (1991) credited the lack of sharps injury-related infections at the University of Wisconsin Hospital and Clinics during the study period (1987-1988) to wide acceptance of Hepatitis B vaccination (almost two-thirds of at-risk health care workers) and a stringent post-exposure protocol. They warn that reliance on universal precautions' emphasis on the use of barriers to prevent direct skin contact may engender a false sense of security because most exposures are from needlestick injury. Bowden et al. (1993) found that no health care workers developed serological markers for HIV, Hepatitis B or Hepatitis C during a 6 year(1985-1991) prospective study of 230 occupational exposures at Fairfield Infectious Diseases Hospital, Victoria, where the Body Substance Isolation System and a "no needle-recapping" policy, together with mandatory staff Hepatitis B vaccination is in force. They concluded that the risk of acquiring HIV (and other bloodborne diseases) through occupational exposure is very low, and can be further reduced by appropriate work practices. Similarly, Wong et al. (1991) found, in a prospective pre- and post-implementation study of 227 physicians on three acute medical wards, that implementation of universal precautions effectively reduced the risk of occupational exposure among those physicians.

### **Knowledge Level About Hepatitis B**

Adoption of universal precautions was recommended by the Centers for Disease Control, Atlanta in 1987, but the level of knowledge shown by nurses about the transmission and prevention of Hepatitis B is not high. In a survey of 334 high-risk registered nurses at Hahnemann University Hospital (U.S.A.), Spence and Dash (1990) found 68.1% of 169 respondents incorrectly answered questions about transmission. Troya et

al. (1991) also found "only a small proportion" (p. 273) of 190 respondents (31.7%) of the 600 nurses surveyed at the University of California San Diego Medical Centre could correctly answer questions about the Hepatitis B virus and HIV. Similarly, Mundt (1992), with a 47% response, also found inadequate knowledge among a convenience sample of 197 occupational health nurses working in health care facilities, most of whom (93%) had the responsibility of teaching other health care staff about the Hepatitis B vaccine. She found, however, that knowledge level did not predict acceptance of the Hepatitis B vaccine. Linden (1991) also found no significant relationship between overall knowledge of infection control and observed practice.

### **Summary**

In summary, the literature indicates that health care workers are at risk of contracting Hepatitis B through occupational exposure, especially by needlestick injury. Reduction of risk is possible by consistent use of universal precautions: prevention of the disease is possible by vaccination. Overall, the research literature shows that despite availability of safe and effective vaccines, acceptance of Hepatitis B vaccination among nurses is generally low (Burden & Whorwell, 1991; Hersey & Martin, 1994; McKenzie, 1992; Spence & Dash, 1990; Trevelyan, 1991). However, Mundt's (1992) study of occupational health nurses and Marles' (1993) study of practice nurses in the U.K. found higher levels of vaccination among nurses who are themselves involved in employee or patient vaccination programs. Several studies also found compliance with universal precautions to be low (Dajczman et al., 1992; Dalton et al., 1992; McCormick et al., 1991; McKeown, 1992; Willy et al., 1990). Nurses' knowledge about the transmission and prevention of

Hepatitis B was disappointing (Linden, 1991; Mundt, 1992; Spence & Dash, 1990; Troya et al., 1991).

The Health Belief Model was used as the basic framework for several studies. A significant positive relationship was found between perceived susceptibility to infection and vaccine acceptance (Bodenheimer et al., 1986; Mundt, 1992), and between perceived risk and compliance with universal precautions (Willy et al., 1990). However, despite statistically significant higher scores for knowledge of transmission among respondents categorised as universal precautions "compliers", Willy et al. (1990) concluded that "increased knowledge of transmission does not have a profound impact on behaviour" (p.355). Similarly, Mundt (1992) found no relationship between knowledge and acceptance of vaccine. Grady et al. (1993), on the other hand found that while a positive relationship existed between caring for patients with bloodborne diseases (including AIDS) and increased perceived risk, a negative relationship developed with regard to compliance with precautions.

The results of the literature review have implications for the present study. Although acceptance of the Hepatitis B vaccine and compliance with universal precautions guidelines have been shown to be low in several studies, no studies have been found pertaining to vaccine acceptance and compliance with universal precautions guidelines among Australian nurses, or specifically, Australian practice nurses. This study will, therefore, fill a gap in nursing knowledge. The Health Belief Model has been successfully used by other authors to explain or predict vaccine acceptance and compliance with universal precautions among nurses and other health care workers. This study will establish the incidence of vaccination and self-reported compliance with universal precautions among practice nurses, and use of the Health Belief Model will explain to what extent health beliefs have contributed to their actions. The model

is, therefore, believed to be appropriate for this study, although it is recognised that some studies have suggested that the Health Belief Model does not adequately explain health behaviour. This study will further test the model.

## **CHAPTER 3**

### **Theoretical Framework**

The Health Belief Model was used as the basic framework of this study. The model was conceptualised by Rosenstock in 1974 to explain preventative health behaviours in healthy individuals. Provision of information alone has long been recognised as insufficient motivation for people to take preventative action for their health and safety. Successful intervention also requires the identification and comprehension of attitudes, beliefs, and needs of the target individual or group (Gross & Bonwich, 1982). Although designed to predict preventative health behaviour, the Health Belief Model has been modified to explain other health behaviours, with "particular applicability in predicting behaviour directed at disease prevention, including participation in immunisation programs." (Bodenheimer et al., 1986, p. 252).

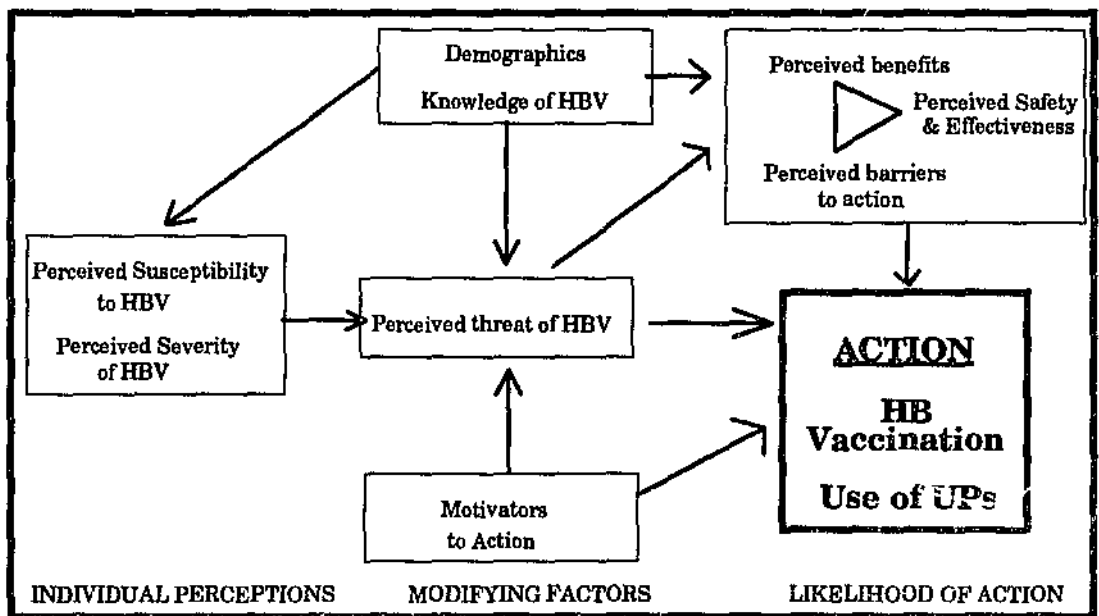
The Health Belief Model has been used before in the examination of vaccine acceptance. Previous studies examined Hepatitis B vaccine acceptance (Bodenheimer et al., 1986; Mundt, 1992), childhood immunisation, (Bennett & Smith, 1992; Henderson, 1990), influenza vaccination in children with asthma (Szilagyi, Rodewald, Savageau, Yoos, & Doane, 1992), and swine influenza vaccination by others.

In this study the perceptions that an individual holds about her susceptibility to Hepatitis B, the severity or seriousness of the disease, and the benefits and barriers attached to taking an action (vaccination and/or use of Universal Precautions) to reduce the threat of the disease were examined. The model postulates that perceived susceptibility and perceived severity of Hepatitis B infection is influenced by demographic factors and prior knowledge of the disease. These, together with motivating factors such as education, determine the perceived threat of the disease. The model suggests that action will be taken if the perceived

threat is high and if the perceived benefits of action (such as immunity to, or reduced risk of severity of Hepatitis B) taken together with the perceived safety and effectiveness of the vaccine, outweigh perceived barriers (such as cost) of the vaccine. If the vaccine is believed to be safe and effective, vaccination will be more likely. However, if safety and effectiveness are questioned by the individual, then these factors provide barriers to vaccination.

Preventative action may depend on “changing long-standing behaviour patterns” (Gross & Bonwich, 1982, p. 27). For example, in the past needles were routinely recapped as a safety measure. Now, however, to minimise needlestick injuries, universal precautions guidelines recommend they should not be recapped.

A diagrammatic representation of the framework is shown in Figure 1.



**Figure 1:** Diagrammatic Representation of Conceptual Framework Based on The Health Belief Model. Adapted from Egger, Spark & Lawson, (1990) (after Rosenstock).

The potential actions pertaining to this study were (a) Hepatitis B vaccination, and/or (b) use of protective measures against the Hepatitis B virus (universal precautions). The variables used in the study were (a) demographics, (b) knowledge of Hepatitis B transmission, (c) perceived susceptibility to Hepatitis B infection (recognition of personal risk), (d) perceived severity of the disease, (e) motivators, (f) perceived benefits gained from vaccination, (g) perceived barriers to vaccination, and (h) perceived safety and effectiveness of the vaccine.

## **CHAPTER 4**

### **Method**

#### **Sample**

A random sample of 200 practice nurses was selected from a total of 339 general nurses, registered Division-A with the Nurses Board of Western Australia, who declared their employment to be in "Doctor's rooms". Selection of this sample required co-operation between the Nurses Board of Western Australia and the Human Resources Branch of the Health Department of Western Australia. Anonymous information on nurses, including area of practice, is held by the Health Department of Western Australia. This is collated from a questionnaire which accompanies annual registration documents from the Board. This information is linked to the Nurses Board register by a unique identifying number, the key to which is held by the Board. Following the granting of access to the Register by the Nurses Board of Western Australia for this study, staff from the Human Resources Branch of the Health Department of Western Australia selected the sample of numbers from their database. These numbers were then matched to names and addresses on the Register by Nurses Board staff. To maintain Register confidentiality, the researcher was not permitted personal access to this information.

A total of 135 responses (67.5%) were received from the 200 practice nurses selected for the sample. Of these, 118 completed questionnaires (59%) were included in the analysis. However, 17 responses (8.5%) were not included in the analysis for reasons shown in Table 1. The sample was a true random sample, and therefore, despite the unavailability of some demographic information, the final sample of 118 respondents is considered to be representative of all practice nurses in Western Australia because the response rate was greater than 50%.



Table 1

Responses Not Included in Analysis

Response	Number
No longer working as a practice nurse	7
Questionnaire returned incomplete	4
Questionnaire returned not completed	3
Retired	2
Never been a practice nurse	1

Design

This quantitative study used a descriptive-correlational design. Demographic data, and information about knowledge, health beliefs and actions concerning Hepatitis B were gathered by utilisation of an anonymous mailed questionnaire. Because the researcher was not permitted personal access to the Nurses Board Register, an anonymous questionnaire was the only available means of gathering information. Other sampling methods were considered, but discarded as unsatisfactory. For example, the Special Interest Group for Nurses in Doctor's Surgeries and Clinics has only 45 members and the Australian Nursing Federation lists only union members. These two groups are very small and may have different characteristics to each other and to practice nurses as a whole group. An alternative was to send letters to a random selection of doctor's surgeries addressed to "The Practice Nurse". This had several deficiencies. In a previous survey, Le Sueur and Barnard (1993) found that 130 of 471 general practices in Perth (approximately 27%) employed a nurse, and that an individual surgery might employ between one and 10 nurses. An adequate response rate would be difficult to obtain. Further, there is no guarantee that a questionnaire addressed

to "The Practice Nurse" would actually reach her (or him), as in many surgeries all mail is opened and "vetted". It was, therefore, preferable that the questionnaire be sent to the nurse's home address. Maintenance of Register confidentiality also made observation of practice and personal interview of respondents impossible. The choice of design was appropriate to examine the relationship of vaccination against the Hepatitis B virus, and the use of universal precautions to the health beliefs of practice nurses.

### **Instrument**

The instrument used in this research was the 67 item Hepatitis B Awareness Questionnaire which consists of an adaptation of the 62 item Hepatitis B Vaccine Acceptance Questionnaire developed by Bodenheimer et al. (1986), plus questions added by this researcher and by Mundt (1992). The presentation was modified to Australian speech patterns and to reflect current knowledge. (See Appendix B, Hepatitis B Awareness Questionnaire.)

The Hepatitis B Vaccine Acceptance Questionnaire was developed by Bodenheimer et al. (1986) to measure acceptance of Hepatitis B vaccine among hospital workers shortly after the vaccine became available. The Health Belief Model was used as a construct of their study. Data were collected by personal interview and included demographic data, knowledge of Hepatitis B, desire to be vaccinated against Hepatitis B virus and health beliefs pertaining to the disease. Their questionnaire also included three health locus of control scales (powerful others, internal and chance) which were not included for the present study. A copy of the Hepatitis B Vaccine Acceptance Questionnaire (Bodenheimer et al., 1986) together with a letter of permission to use and adapt it is provided in Appendix C.

Mundt (1992) adapted the Hepatitis B Vaccine Acceptance Questionnaire to obtain additional demographic data specific to her population of hospital based occupational health nurses. She also asked respondents if they had ever had a dirty needlestick injury or blood splash and if they had been vaccinated against Hepatitis B, or their reasons for non-vaccination. These questions have been included in the Hepatitis B Awareness Questionnaire for this study (Question Nos. 65 & 68). Mundt's question relating to the acceptance rate of the Hepatitis B vaccine by employees in the participant's workplace has not been included. In this study, as in Mundt's (1992), the locus of control scales were not included in the questionnaire since the focus of the research was not on the sources of control of action. A copy of the adapted questionnaire and scoring documentation used by Mundt (1992), together with a copy of her offer of assistance is provided in Appendix D. Verbal permission was given by Ms Mundt to utilise her adaptation (personal communication 25 April 1994). The scoring for much of the Hepatitis B Awareness Questionnaire has been taken from documentation supplied by Ms Mundt and is given in detail in Appendix E.

In this study the potential actions were (a) Hepatitis B vaccination and/or (b) use of protective measures against Hepatitis B virus (universal precautions). Bodenheimer et al.(1986) defined their dependent variable as the "stated intention of receiving the Hepatitis B vaccine" (1986, p. 252), while Mundt's (1992) dependent variable was "acceptance of the Hepatitis B vaccine" (1992, p. 29).

Questions from the Hepatitis B Vaccine Acceptance Questionnaire were used to assess acceptance of Hepatitis B vaccine, knowledge of Hepatitis B, susceptibility to Hepatitis B, severity of Hepatitis B, and safety and effectiveness of the vaccine. Adaptation of individual

questions (other than a change in presentation to suit Australian speech patterns) and additional questions are described in detail below.

**Demographic information:** Specific demographic information required for this study was obtained in questions 1-5 and included type of practice, nursing qualifications held and how many years respondents had worked as a registered nurse and specifically as a practice nurse. They were not asked if they worked full- or part-time. Respondents were also asked if their job included teaching about and administration of Hepatitis B vaccine to others (this question from Mundt, 1992).

**Action:** Nineteen items measured the action component of this study. Acceptance of Hepatitis B vaccine was measured by Questions 8, 10 and 11, and use of universal precautions was measured by Questions 46-64, which were added for this study.

Question 8 from the Hepatitis B Awareness Questionnaire asked participants if they had had the full course of 3 intramuscular injections of Hepatitis B vaccine. This was an adaptation from a question in Mundt's survey which asked if the respondent had had the vaccine. Vaccinated respondents were asked if their post-vaccination immune status was known (Question 10), and in Question 11, non-vaccinated respondents were asked their intentions regarding vaccination. (These questions were added for this study.)

Questions 46-61 asked whether gloves were worn when performing certain procedures or tasks. The method of handling and disposal of used needle/syringe units was obtained from Questions 62 and 63. The final question in this category, Question 64, asked respondents to choose which immediate actions they would take if they sustained a needlestick injury in their workplace.

**Knowledge:** Knowledge about Hepatitis B was measured by 16 items, Questions 31-45 and Question 67 which was added for this study. A True/False/Don't know response was required for Questions 31-45. Question 67 allowed a choice of 4 options plus "don't know". The "don't know" options were added following the pilot study, to prevent a forced choice which could give an inaccurate result. The wording of Question 36 was changed to read "You are unlikely to catch Hepatitis B through a blood transfusion in Australia", and Question 44 was reworded to "There is effective treatment for some cases of Hepatitis B infection" to reflect changes in treatment options. Although used to measure both knowledge and perceived susceptibility in the Hepatitis B Vaccine Acceptance Questionnaire, Question 31 (What do you think the chance of catching Hepatitis B is for a practice nurse ?) was used in this study to measure knowledge only.

**Perceived susceptibility:** Perceived susceptibility to Hepatitis B infection was measured by Questions 13, 30, 65 and 66. Question 65 asked if the participant had ever had a dirty needlestick injury or a blood splash, and was added by Mundt (1992) to measure perceived susceptibility to the Hepatitis B virus. It was presumed that the circumstance of actual exposure to blood or body fluids would increase perceived susceptibility to infection. Question 66 was added for this study to determine if the Hepatitis B status of the source patient was known.

**Perceived severity:** Participants' perceived severity of Hepatitis B infection was determined by Questions 14-17. These questions are unchanged from the Hepatitis B Vaccine Acceptance Questionnaire.

**Motivation:** Two questions about motivators to vaccination were added for this study. Question 6 asked about specific education regarding

Hepatitis B infection within the previous 2 years, and Question 9 asked vaccinated respondents why they decided to have the vaccine.

**Benefits:** A multi-choice question (Question 7) was added to determine what benefits participants thought would be gained from having the Hepatitis B vaccine.

**Perceived barriers to vaccination:** Barriers to vaccination were measured by 6 items. Questions 22-25 assessed cost as a barrier to vaccination. Vaccine form as a barrier was measured in Question 26. Question 12 was added to ask the reason for non-vaccination in those participants who had no intention of being vaccinated.

**Perceived safety and effectiveness of the vaccine:** Seven items measured the perceived safety and effectiveness of the Hepatitis B vaccine. Respondents were asked what they thought the chances were of having specific side effects of the vaccine in Questions 18-21. Questions 27 and 28 asked respondents to rate the effectiveness and the safety of the Hepatitis B vaccine, and Question 29 addressed beliefs about general vaccine safety.

**Comments:** The final section of the instrument invited participants to comment about Hepatitis B and practice nursing.

Although a long questionnaire, it was estimated to take no more than 20 minutes to complete as almost all questions could be answered by circling the number which corresponded to the participant's response.

### **Instrument validity.**

Bodenheimer et al. (1986) formed eight scales from the responses to individual questions in the Hepatitis B Vaccine Acceptance Questionnaire. Three scales were related to the locus of control questions and are not relevant to this study. Coefficient alpha ranges were 0.52 for

knowledge of Hepatitis B, 0.49 for susceptibility to Hepatitis B, 0.77 for severity of the disease, 0.69 for safety and effectiveness of the vaccine, and 0.82 for discomfort of vaccine. Although correlations between the scales for susceptibility to Hepatitis B (alpha 0.49), and knowledge of Hepatitis B (alpha 0.52), and other variables might be weakened by lower than desired alpha values, Bodenheimer et al. (1986) concluded that "this effect biases results conservatively" (p.252). These figures have been accepted for this study. However, because some items were adapted and others added to form the Hepatitis B Awareness Questionnaire, further validation was necessary.

The presentation of this survey was modified to Australian speech patterns and to maximise reading fluency. A small pilot study of the Hepatitis B Awareness Questionnaire among General Registered Nurses (n = 9) in Perth tested its face validity. Minor changes were made following this. Using the index of content validity (CVI) (Lynn, 1986), the modified 67 item instrument was reviewed by a panel of experts consisting of 5 practice nurses belonging to the Special Interest Group for Nurses in Doctors' Surgeries and Clinics. All but one item achieved the required 3 or 4 rating by all 5 panel members to have item validity endorsed. Question 64, which 4 experts rated as 3, had an agreement of .80. Content validity of the instrument beyond the .05 level of significance, therefore, was .985. A research pathologist with an interest in Hepatitis B vaccination also reviewed the questionnaire. Changes recommended in Questions 38, 39 and 40 had already been made. However, although he believed that Questions 43 and 44 could be reasonably answered as either "true" or "false", it was decided to use "true" as the correct answer in this study. Sensitivity of the instrument was displayed by the provision of 3-5 categories in scales, enabling respondents to make discriminating answers (Jacobson, 1992).

## **Procedure**

A questionnaire, together with an explanatory cover letter and Freepost reply envelope, was sent to the home address of each of 200 randomly selected practice nurses in Western Australia. (Copies of the first and second cover letters are provided in Appendix F.) Selection and identification of participants was done by the Nurses Board of Western Australia with the co-operation of the Health Department of Western Australia. The researcher had no access to these names and addresses. Labelling and postage of filled envelopes was carried out by staff of the Nurses Board of Western Australia. Two weeks after the initial mailing a follow-up questionnaire was sent by the Nurses Board to every nurse in the sample with a request that it be ignored if the previous questionnaire had been returned. Replies were sent to the researcher's home address. Queries were directed in the first instance to the researcher's supervisors who then anonymously conveyed them to the researcher. The names of the supervisors and their contact telephone numbers at Edith Cowan University were included in the cover letter.

## **Data Analysis**

Data were in nominal and/or ordinal form. Coded data were entered and analysed using the SPSS for Windows statistical package. Analysis was by means of descriptive statistics, t-tests and one-way analysis of variance (ANOVA). Correlations, using Pearson's correlation coefficient, were done to measure the strength of relationships between components of the Health Belief Model. Content analysis was performed on comments. Data are presented as descriptive summaries, and as tables and figures where appropriate.



### **Ethical Considerations**

This study was approved by the Faculty Higher Degrees Committee of Edith Cowan University and the Nurses Board of Western Australia. Approval from medical bodies was not sought as this was a nursing study concerned with independent nursing behaviours, and questionnaires were sent to the home address of each nurse in the sample.

Participation in the study was voluntary and consent implied by return of a completed questionnaire. Raw data remained confidential, with access only by the nurse researcher. Anonymity of participants was maintained at the data analysis stage and identification of nurses was not possible from the data collected.

### **Summary**

A response rate of 59% (118) was received from an anonymous 67 item questionnaire mailed to a random sample of 200 practice nurses in Western Australia. A descriptive-correlational design was used to examine the relationship of vaccination against the Hepatitis B virus and the use of universal precautions to the health beliefs of practice nurses. Analysis was by means of descriptive analysis, *t*-tests, one-way analysis of variance, and correlations to measure the strength of relationships between components of the Health Belief Model.

## **CHAPTER 5**

### **Findings**

In this chapter, questions were analysed and presented, not in the order in which they appeared in the questionnaire, but according to their relationship with components of the Health Belief Model and to each other. Demographic information is presented first, followed by questions concerned with the action, or outcome component of the model, represented by acceptance of Hepatitis B vaccination, and/or use of universal precautions. Next are questions dealing with knowledge about Hepatitis B transmission, and then questions relating to perceived susceptibility to Hepatitis B, perceived severity of the disease, and the perceived threat of the disease are presented. Following are questions relating to possible motivators to vaccination, and to the perceived benefits, barriers and the safety and effectiveness of the vaccine.

Some questions were not answered by all respondents. Missing values were treated differently according to the calculations required. Where missing values were present in five or fewer cases of a single variable the series mean was calculated and inserted in place of the missing value or values (Tabachnick & Fidell, 1989). No variable needed exclusion from calculation because of a larger number of missing values.

However, not all questions could be treated in this way. Demographic questions were analysed on the valid responses. Also, sometimes the response to one question dictated which question would next be answered. For example, Question 8 asked if respondents had had the full course of Hepatitis B vaccine. An answer of "yes" directed the respondent to Questions 9, 10 and then 13. When analysing individual variables in this category valid replies only were used. However, when analysing individual cases, the unanswered questions (for example, Questions 11 & 12) were recoded from "missing" to "0", not only to prevent exclusion from

analysis, but also to ensure no alteration to individual scores on Health Belief Model components. Questions 46-61 also required special treatment as many nurses did not undertake some of the procedures listed. The method of dealing with these responses is set out in the appropriate section, and in more detail in Appendix E which gives the scoring for this instrument.

Unless otherwise indicated, analysis was done on the total sample of 118 respondents. Unequal groups have been used in t-tests, but except where specified in the results, Levene's Test for Equality of Variances showed no significant differences in the variances of the two groups, and t values for equal variances were used. At the end of each section differences between the vaccinated and non-vaccinated groups were analysed.

### **Demographics**

#### **Type of practice.**

Of 115 respondents to Question 1, 90 (78.3%) worked in general practices, 9 (7.8%) in medical specialist practices and 16 (13.9%) in surgical specialist practices. Two nurses stated that they worked in a pathology practice. These were subsumed into the "general practice" group. Pathology practices are also "private medical practices" and, therefore, other pathology nurses may have been included in the sample.

#### **Nursing qualifications.**

All 118 respondents answered Question 2 about nursing qualifications. A "general" nursing qualification was claimed by 115 people (97.5%), "midwifery" by 26 people (22%) and "child health" by 2 people (1.7%). It was expected that all respondents would claim qualification in at least one of these categories as the sample was drawn

from nurses registered "Division-A" with the Nurses Board of Western Australia. However, one made no such claim, but did claim a "gerontology" qualification. "Other" qualifications were claimed by 13 respondents (10.6%). These included 3 nurses with paediatric qualifications, 2 with Family Planning Association Nurse Practitioner qualifications and 1 with a Bachelor of Science (Nursing) and a Graduate Diploma of Occupational Health.

### **Years as a Registered nurse.**

Question 3 required the 115 respondents to state how many years each had worked as a Registered nurse. There was a range of 4 to 40 years, with a mean of 19.79 years ( $SD = 8.69$ ).

### **Years as a Practice nurse.**

Question 4 was answered by 114 people. The mean number of years worked as a practice nurse was 10.36 years ( $SD = 7.09$ ), with a range of 1 month to 35 years. However, 61.4% had worked as a practice nurse for 10 years or less.

### **Comparison of number of years worked.**

There was no significant difference between nurses in the vaccinated group ( $M = 19.87$ ,  $SD = 8.53$ ), and nurses in the non-vaccinated group ( $M = 19.48$ ,  $SD = 9.49$ ),  $t(113) = 0.19$ ,  $p = .848$ , in the number of years they had worked as registered nurses. Nor was there a significant difference in the number of years worked as practice nurses between the vaccinated group ( $M = 10.23$ ,  $SD = 7.03$ ), and the non-vaccinated group ( $M = 10.91$ ,  $SD = 7.50$ ),  $t(112) = 0.40$ ,  $p = .677$ .

There was also no significant difference in the number of years worked as registered nurses, between nurses who had high indices of

glove usage ( $M = 20.80$ ,  $SD = 8.67$ ), and nurses who had lower indices of glove usage ( $M = 18.87$ ,  $SD = 8.80$ ),  $t(110) = 1.15$ ,  $p = .248$ . However, nurses who had high indices of glove usage had worked significantly longer as practice nurses ( $M = 11.75$ ,  $SD = 7.00$ ) than nurses who had lower indices of glove usage ( $M = 9.02$ ,  $SD = 6.75$ ),  $t(99.31) = 2.07$ ,  $p = .040$ .

### **Teaching About Hepatitis B Vaccine**

Of 117 respondents to Question 5, 50% (59) said their job included teaching about and administration of Hepatitis B vaccine to others. Nurses who teach about and administer the Hepatitis B vaccine ( $M = 0.93$ ,  $SD = 0.25$ ) were significantly more likely to be vaccinated against the disease than nurses who did not teach about and administer the vaccine ( $M = 0.67$ ,  $SD = 0.47$ ),  $t(86.89) = 3.69$ ,  $p < .001$ . (Levene's Test for Equality of Variances was significant:  $F(1,115) = 77.10$ ,  $p < .001$ ], therefore, the  $t$ -test for unequal variances was used.)

### **Action**

#### **Action.**

Ninety-five (80.5%) respondents to Question 8 had had the full course of 3 intramuscular injections of Hepatitis B vaccine. Seroconversion (immunity to Hepatitis B) was confirmed in 70 (74.5%) of the 94 vaccinated respondents to Question 10. Seven people (7.4%) had been tested but had not seroconverted and 17 people (18.1%), had not had a blood test. Of those who had had a blood test, all knew the result of that test, whether positive or negative.

Of 23 non-vaccinated respondents (Question 11), 4 had commenced the course, with 2 intending to complete and 2 not intending to complete

the course. Of 19 respondents who had not commenced vaccination, 11 intended to have the course and 8 had no desire to be vaccinated.

### **Use of universal precautions.**

Use of universal precautions was assessed in Questions 46-64 which asked whether respondents wore gloves when performing certain tasks or procedures. Procedures in this section were scored on a 1-5 scale, with 1 corresponding to "never" and 5 corresponding to "always". Not all respondents carried out all 16 procedures. Analysis was undertaken on valid cases for each variable and then individual scores were calculated over the range of variables according to the number of procedures undertaken, and whether the individual used gloves for those procedures. A valid case was one in which the individual performed the task or procedure in question. For example, in Question 46, 57 individuals said they took blood, so analysis for that variable was carried out only on those 57 individuals. Each participant's score was calculated according to the number of procedures undertaken, and then converted to an index of the possible score for that individual. A high score was taken to be an index of .75 or higher. (See Appendix E for details of the calculation of individual scores for this section.) Table 2 shows the number of nurses who performed each procedure, and the percentages of those nurses who reported wearing gloves when performing each procedure. Gloves were used for 20% - 100% of procedures undertaken by individual nurses ( $\bar{M} = 70.78$ ,  $SD = 17.61$ ). There was no significant difference between nurses in the vaccinated group ( $\bar{M} = 0.71$ ,  $SD = 0.171$ ) and non-vaccinated nurses ( $\bar{M} = 0.71$ ,  $SD = 0.20$ ),  $t(113) = 0.07$ ,  $p = .95$ , in the index of glove usage.

Although appropriate glove usage (indicated by bold figures in Table 2) was reported by the majority of practice nurses for most

Table 2

Percentage of Respondents Who Reported Wearing Gloves

	Never	Some- times	Usually	Nearly Always	Always	No. Valid
Taking a blood sample	8.8	40.4	12.3	1.8	36.8	(57)
Urine sample from incapacitated patient	10.1	15.9	14.5	4.3	55.1	(69)
Taking a Pap smear	6.1	9.1	0	3.0	81.8	(33)
Collect sputum sample	12.2	20.4	12.2	4.1	51.0	(49)
Non-touch handling of a pathology specimen	31.0	32.0	10.0	4.0	23.0	(100)
Cleaning up a blood spill	1.8	8.0	7.1	4.5	78.6	(112)
Cleaning up a urine spill	5.9	12.7	5.9	5.9	69.6	(102)
Cleaning up a blood stained urine spill	4.0	10.1	5.1	4.0	76.8	(99)
Cleaning up a vomitus spill	5.2	7.2	9.3	8.2	70.1	(97)
Cleaning up a blood stained vomitus spill	3.2	4.2	8.4	4.2	80.0	(95)
Cleaning used surgical instruments	3.6	11.8	7.3	9.1	68.2	(110)
Non-touch dressing of open wound	7.5	31.1	9.4	15.1	36.8	(106)
Assist at minor surgical procedure	2.9	14.6	8.7	7.8	55.0	(103)
Removing sutures	40.6	29.2	9.4	3.8	17.0	(106)
Giving an injection	67.0	24.3	3.9	1.0	3.9	(103)
Taking a finger prick blood sugar level	51.2	22.6	8.3	6.0	11.9	(84)

procedures, only 11.9% “always” use gloves when taking a finger prick blood sugar level and only 68.2% “always” use gloves to clean used surgical instruments. However, appropriate glove usage during venipuncture was difficult to determine. The decision to wear, or not to wear, gloves while taking a blood sample may be based on self-assessment of venipuncture proficiency, and therefore, no single choice can be said to be appropriate for all respondents in all circumstances. There was, however, no significant difference between the vaccinated group ( $M = 1.94$ ,  $SD = 1.32$ ) and the non-vaccinated group ( $M = 2.62$ ,  $SD = 1.66$ ),  $t(82) = 1.62$ ,  $p = .109$ , in the proportion of nurses who wear gloves when taking a finger prick blood sugar level. There was also no significant difference between the vaccinated group ( $M = 4.27$ ,  $SD = 1.21$ ) and the non-vaccinated group ( $M = 4.25$ ,  $SD = 1.33$ )  $t(108) = 0.05$ ,  $p = .956$  in the proportion of nurses who wear gloves when cleaning used surgical instruments.

#### **Handling and disposal of used needle/syringe units.**

Question 62 asked respondents how they handled a used needle/syringe unit before disposal. Although 62.1%(72) of 116 respondents to this question said they “never recap” needles, 12 of these also claimed another method of handling used needle/syringe units before disposal within the same question. A possible explanation for this is that although respondents were invited to nominate one or more of the four handling methods given, a choice of “usually don’t recap” was not offered. Modifying the option of “never recap” by the choice of an additional method may have seemed a reasonable solution for those respondents who only occasionally recap. One-handed needle recapping was the choice of 15.5% (18) respondents, but the unacceptable two-handed



method of needle recapping was admitted to by 22.4% (26). Use of recapping devices was chosen by only 9.5% (11) of respondents.

In Question 63, 84.7% (100) of respondents said they discarded used needle/syringe units into a sharps container. However, 13.6% (16) respondents admitted to an unacceptable method of disconnecting the needle from the syringe by hand before disposal.

### **Immediate action if needlestick injury occurred.**

A combination of choices was required for a correct answer to Question 64, which asked what immediate action respondents would take if they sustained a needlestick injury in their workplace. A breakdown of responses is given in Table 3.

Table 3

#### **Actions to be Taken if Needlestick Injury Occurred**

Responses to Question 64	No.	(%)
Depends on the patient	23	19.5
Report injury to employer	113	95.8
Request blood test from source patient	78	66.1
Have my blood tested for HBsAg (or immune level)	83	70.3
Commence Hepatitis B vaccination (if not immune)	23	19.5
Nothing. I do not believe I am at risk	2	1.7
Other	3	0.8

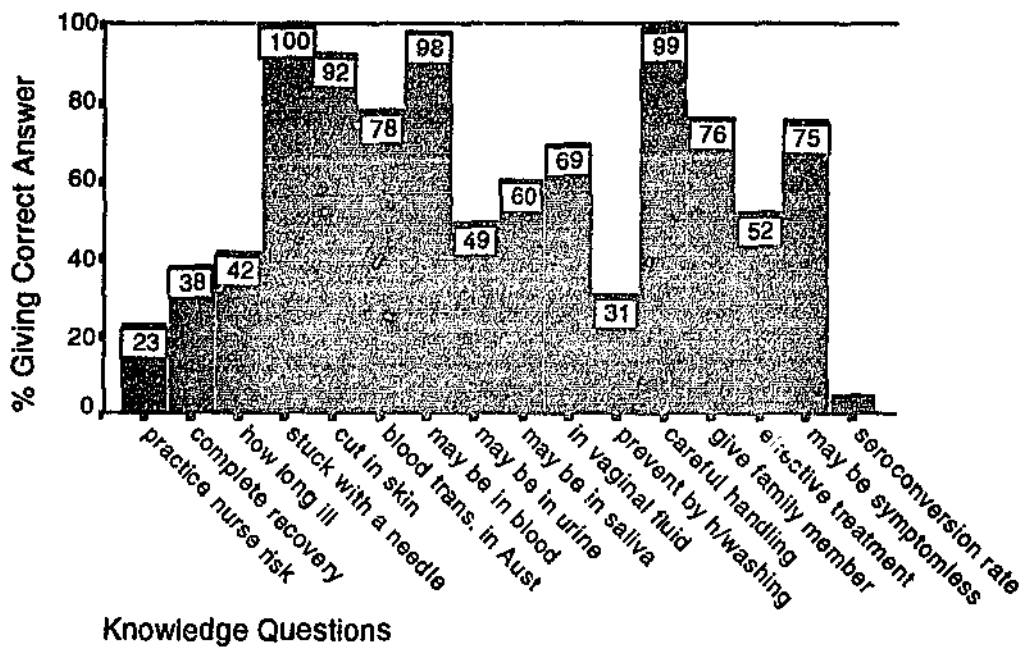
The shaded areas indicate which responses were necessary for correct action. However, the fourth choice in the shaded area (Commence Hepatitis B vaccination) was an optional response for those participants who were already vaccinated. Only 64 (54.2%) of respondents nominated

the combination of responses necessary for a correct response. Of those 64 respondents, 56 (87.5%) had been vaccinated against Hepatitis B infection. Nurses in the vaccinated group ( $M = 0.59$ ,  $SD = 0.50$ ) were significantly more likely to take the appropriate immediate action if they sustained a needlestick injury in their workplace than nurses in the non-vaccinated group ( $M = 0.35$ ,  $SD = 0.49$ ),  $t(116) = 2.11$ ,  $p = .037$ . However, there was no significant difference between nurses with high indices for glove usage ( $M = 0.61$ ,  $SD = 0.49$ ) and nurses with lower glove usage indices ( $M = 0.48$ ,  $SD = 0.50$ ),  $t(113) = 1.32$ ,  $p = .190$ , in the proportion of practice nurses who would take the appropriate immediate action if they sustained a needlestick injury in their workplace.

### **Knowledge of Hepatitis B Transmission**

The level of knowledge about Hepatitis B transmission was not high, as shown by the responses to Questions 31-45 and Question 67. Although almost all respondents correctly answered questions relating to exposure to blood and percutaneous exposures, fewer were aware that the Hepatitis B virus could be found in other body fluids. Even fewer correctly answered questions relating to the risk of contracting the disease if an exposure occurred, and the severity of the disease (See Figure 2.).

Individual knowledge scores ranged from 4-14 ( $M = 9.88$ ,  $SD = 2.23$ ) out of a possible 16. There was no significant difference in the level of knowledge about Hepatitis B transmission between the vaccinated group ( $M = 9.98$ ,  $SD = 2.10$ ) and the non-vaccinated group ( $M = 9.48$ ,  $SD = 2.75$ ),  $t(28.53) = 0.82$ ,  $p = .420$ . (Levene's Test for Equality of Variances was significant:  $[F(1,116) = 4.37$ ,  $p = .039]$ , therefore, the  $t$ -test for unequal variances was used.) There was also no significant difference in the level of knowledge between nurses who had high indices



**Figure 2.** Percentage of Practice Nurses Giving Correct Answers to Knowledge Questions.

for glove usage ( $M = 10.00$ ,  $SD = 2.38$ ) and nurses who had lower indices for glove usage ( $M = 9.72$ ,  $SD = 2.15$ ),  $t(113) = 0.67$ ,  $p = .507$ . Nor was there a significant difference in the respondents' estimates of the chance of a practice nurse catching Hepatitis B between the vaccinated group ( $M = 3.37$ ,  $SD = 1.68$ ) and the non-vaccinated group ( $M = 3.30$ ,  $SD = 1.61$ ),  $t(116) = 0.17$ ,  $p = .869$ , or between nurses with high indices for glove usage ( $M = 3.20$ ,  $SD = 1.64$ ) and nurses with lower indices for glove usage ( $M = 3.55$ ,  $SD = 1.67$ ),  $t(113) = 1.13$ ,  $p = .261$ . Likewise, there was no significant difference in the level of knowledge about Hepatitis B transmission between practice nurses who teach about and administer the vaccine ( $M = 10.27$ ,  $SD = 2.04$ ) and practice nurses who do not ( $M = 9.50$ ,  $SD = 2.39$ ),  $t(115) = 1.88$ ,  $p = .063$ . Nor was there a significant difference in the level of knowledge between nurses who had had specific education about Hepatitis B during the previous 2 years

( $M = 10.26$ ,  $SD = 2.26$ ) and nurses who had not had that specific education ( $M = 9.57$ ,  $SD = 2.18$ ),  $t(116) = 1.69$ ,  $p = .093$ ).

### **Perceived Susceptibility**

Four questions (Questions 13, 30, 65 and 66) measured participants' perceived susceptibility to Hepatitis B infection. In Question 13, a majority of practice nurses (68.6%) thought there was a "very low" chance that they would catch Hepatitis B next year, with most (89.8%) believing the chance to be either "very low" or "low". One respondent thought there was a "very high" chance of contracting the disease.

Question 30 asked if any friends, co-workers or family member had ever had Hepatitis B. It was assumed that awareness of the disease in someone well known to them would increase perceived susceptibility in participants. Only 17 (14.4%) respondents answered in the affirmative. Similarly, a dirty needlestick injury or blood splash was assumed to increase perceived susceptibility. Seventy-three (61.9%) respondents stated they had sustained either a dirty needlestick injury or blood splash at some time (Question 65). Of those 73 exposures, the Hepatitis B status of the source patient (Question 66) was unknown in 43 (58.9%) cases, negative in 29 (39.7%) cases and positive in 1 case.

Individual perceived susceptibility scores ranged from 1 to 6 ( $M = 2.63$ ,  $SD = 1.19$ ). Possible scores ranged from a low of 1 to a high of 9. There was no significant difference in susceptibility scores between the vaccinated group ( $M = 2.66$ ,  $SD = 1.17$ ) and the non-vaccinated group ( $M = 2.50$ ,  $SD = 1.30$ ),  $t(116) = 0.56$ ,  $p = .573$ . Nor was there a significant difference in susceptibility scores between nurses who had high indices for glove usage ( $M = 2.38$ ,  $SD = 1.07$ ) and nurses who had lower indices for glove usage ( $M = 2.78$ ,  $SD = 1.27$ ),  $t(113) = 1.80$ ,  $p = .075$ . However, practice nurses who were aware of Hepatitis B infection in someone well

known to them ( $M = 3.44$ ,  $SD = 1.03$ ) had a significantly higher susceptibility score than practice nurses who were not aware of Hepatitis B infection in someone well known to them ( $M = 2.49$ ,  $SD = 1.17$ ),  $t(116) = 3.14$ ,  $p = .002$ . Significantly higher susceptibility scores were also found in practice nurses who had had a dirty needlestick injury or blood splash ( $M = 3.21$ ,  $SD = 0.86$ ) than in practice nurses who had not had such an exposure ( $M = 1.68$ ,  $SD = 1.04$ ),  $t(116) = 8.66$ ,  $p < .001$ .

### **Perceived Severity of Hepatitis B Infection**

Participants' perceived severity of Hepatitis B infection was measured by Questions 14-17. The majority (61%) of respondents to Question 14, believed there was a "very low" or "low" chance that they would need to be hospitalised if they contracted Hepatitis B infection. Only 4 (3.4%) respondents believed the chance of hospitalisation was "very high".

In Question 15, 38 (32.2%) people believed there was a "high" chance that they would miss work for more than 1 month if they caught Hepatitis B. However, almost the same number of people believed there was a "very low" chance (16) as believed there was a "very high" chance (17) of missing work for more than one month.

Thirty-five (29.7%) respondents to Question 16 believed there was a "medium" chance that their life would be shortened if they contracted Hepatitis B. However, while a further 31 (26.3%) believed the chance of shortened life was "high", only 9 (7.6%) respondents believed the chance was "very high". An almost equal number of respondents to Question 17 believed that there was a "very low" (33.1%) or "medium" (31.4%) chance that they would become so ill they would die if they contracted Hepatitis B infection. However, 5 (4.2%) respondents believed the chance of dying was "very high".

Individual perceived severity scores ranged from the minimum possible score of 4 to the maximum possible score of 20 ( $\underline{M} = 10.85$ ,  $\underline{SD} = 3.72$ ). There was no significant difference in the severity scores between the vaccinated group ( $\underline{M} = 11.09$ ,  $\underline{SD} = 3.64$ ) and the non-vaccinated group ( $\underline{M} = 9.87$ ,  $\underline{SD} = 3.96$ ),  $t(116) = 1.41$ ,  $p = .160$ . However, practice nurses with lower indices for glove usage had significantly higher perceived severity scores ( $\underline{M} = 11.51$ ,  $\underline{SD} = 3.47$ ) than practice nurses with high indices for glove usage ( $\underline{M} = 10.15$ ,  $\underline{SD} = 3.85$ ),  $t(113) = 1.99$ ,  $p = .049$ .

### **Perceived Threat**

Perceived threat was calculated by the addition of individual scores for perceived susceptibility to, and perceived severity of Hepatitis B infection. Individual scores ranged from 5 to 22.50 ( $\underline{M} = 13.48$ ,  $\underline{SD} = 4.19$ ). Possible scores ranged from a low of 5 to a high of 29. There was no significant difference in the scores for perceived threat between the vaccinated group ( $\underline{M} = 13.75$ ,  $\underline{SD} = 4.08$ ) and the non-vaccinated group ( $\underline{M} = 12.37$ ,  $\underline{SD} = 4.58$ ),  $t(116) = 1.42$ ,  $p = .159$ . On the other hand, practice nurses with lower indices for glove usage had significantly higher perceived threat scores ( $\underline{M} = 14.29$ ,  $\underline{SD} = 3.96$ ) than practice nurses with high indices for glove usage ( $\underline{M} = 12.53$ ,  $\underline{SD} = 4.26$ ),  $t(113) = 2.29$ ,  $p = .024$ .

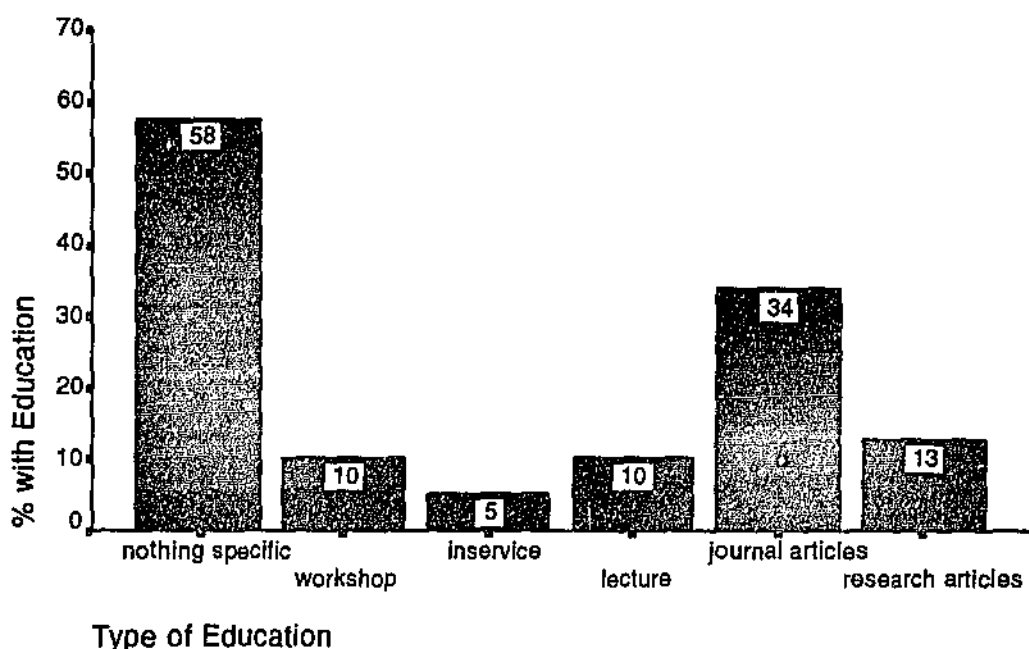
### **Possible Motivators**

A motivator is something which stimulates, or prompts, an individual to act in a certain way. In this study, education about the Hepatitis B virus or other bloodborne viruses was assumed to increase perceived susceptibility to, and/or perceived severity of Hepatitis B infection, and thereby, to increase the perceived threat of the disease. Education was

also assumed to influence the acceptance of the Hepatitis B vaccine and the use of universal precautions.

### **Hepatitis B education in last 2 years.**

In Question 6, more than half (57.6%) of the respondents had had no specific education regarding Hepatitis B or related issues in the previous 2 years (see Figure 3). The most common form of education was through journal articles (33.9%), whereas only 25.5% said they had received any formal education on this issue.



**Figure 3. Hepatitis B Education in Last 2 Years**

**Note.** Some respondents declared more than one category of education, therefore, the total percentage equals more than 100%.

There was no significant difference in perceived susceptibility scores between practice nurses who had had some Hepatitis B education in the previous 2 years ( $M = 2.73$ ,  $SD = 1.28$ ) and practice nurses who had had no Hepatitis B education in the previous 2 years ( $M = 2.55$ ,  $SD = 1.13$ ),

$t(116) = 0.82, p = .415$ . There also was no significant difference in perceived severity scores between those nurses who had had some Hepatitis B education ( $M = 10.79, SD = 3.68$ ), and practice nurses who had not had such education ( $M = 10.90, SD = 3.79$ ),  $t(116) = 0.15, p = .879$ . Nor was a significant difference found in the perceived threat scores between practice nurses who had had some Hepatitis B education in the previous 2 years ( $M = 13.52, SD = 4.15$ ), and practice nurses who had had no Hepatitis B education in the previous 2 years ( $M = 13.44, SD = 4.26$ ),  $t(116) = 0.10, p = .923$ . Furthermore, there was no significant difference between nurses with Hepatitis B education ( $M = 0.85, SD = 0.36$ ), and nurses with no Hepatitis B education ( $M = 0.77, SD = 0.43$ ),  $t(115.77) = 1.10, p = .272$ , in the proportion who had been vaccinated against Hepatitis B. (Levene's Test for Equality of Variances was significant:  $[F(1,116) = 4.96, p = .028]$ , therefore, the  $t$  test for unequal variances was used.) However, practice nurses who had had some Hepatitis B education in the previous 2 years were significantly more likely to use gloves for the procedures they undertook ( $M = 0.75, SD = 0.15$ ) than were practice nurses who had not had Hepatitis B education ( $M = 0.67, SD = 0.19$ ),  $t(111.26) = 2.49, p = .014$ . (Levene's Test for Equality of Variances was significant:  $[F(1,113) = 4.49, p = .036]$ , therefore, the  $t$ -test for unequal variances was used.)

### **Reasons for vaccination.**

Reasons for being vaccinated against Hepatitis B were given by the 95 vaccinated respondents (80.5% of the sample) in Question 9. A breakdown of responses is given in Figure 4. Of the 23 responses under the heading of "other", 16 could be classified as "self-care" reasons, 4 stated high risk employment (current or previous) was the reason, 2 were



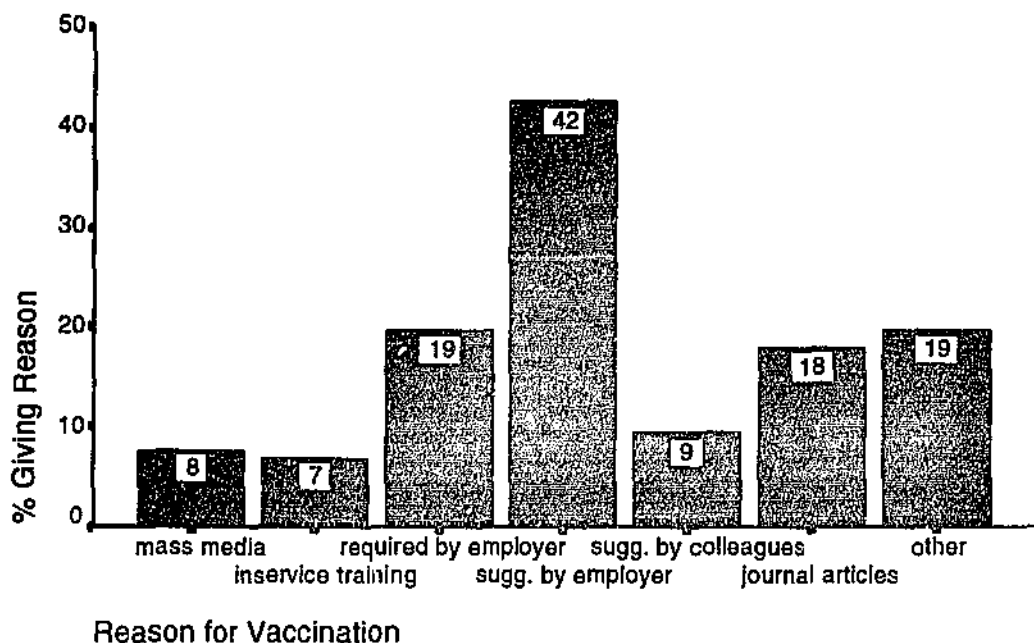


Figure 4. Motivation to Have Hepatitis B Vaccination

Note. Some respondents gave more than one reason for vaccination, therefore, the total percentage exceeds 100%.

because of needlestick injury and 1 had the vaccine because her employer paid for it.

### Perceived Benefits, Barriers and the Safety and Effectiveness of the Vaccine

#### Perceived benefits.

In response to Question 7, 117 respondents chose benefits they thought would be gained from having the Hepatitis B vaccine. The remaining respondent thought no benefit would be gained from having the vaccine. Table 4 shows a breakdown of the number of practice nurses choosing each response. Individual scores for perceived benefit of the vaccine ranged from the minimum of 0 to the possible maximum of 3 ( $M = 1.94$ ,  $SD = 0.85$ ). There was no significant difference between the vaccinated group ( $M = 1.93$ ,  $SD = 0.83$ ) and the non-vaccinated group ( $M = 2.00$ ,

Table 4

Number Choosing Benefits from Hepatitis B Vaccine

Benefit	Frequency	(%)
Protection from contracting HBV	117	(99.2)
Will not transmit disease	61	(51.7)
Help protect my family	51	(43.2)
No particular benefit	1	(0.8)

SD = 0.95),  $t(116) = 0.37$ ,  $p = .711$ , in the perceived benefits of the Hepatitis B vaccine. There was no correlation between the perceived threat of Hepatitis B infection and the perceived benefits of vaccination against the disease ( $r[116] = 0.006$ ,  $p = .943$ ).

**Perceived barriers.**

Perceived barriers were measured by Questions 22-26. Cost of the vaccine and its route of administration were not perceived barriers for most respondents. Scores for individual perceptions of cost as a barrier (Questions 22-24) ranged from the minimum of 3 to the maximum of 15 ( $M = 6.24$ ,  $SD = 3.34$ ). Practice nurses in the vaccinated group were significantly more likely to have low perceived barrier scores ( $M = 5.73$ ,  $SD = 2.88$ ) than those in the non-vaccinated group ( $M = 8.34$ ,  $SD = 4.28$ ),  $t(27.01) = 2.78$ ,  $p = .010$ . (Levene's Test for Equality of Variances was significant:  $[F(1,116) = 8.67, p = .004]$ , therefore, the  $t$ -test for unequal variances was used.) There was no correlation between perceived threat and cost of the vaccine as a barrier ( $r[116] = 0.031$ ,  $p = .736$ ).

Cost was considered to be a barrier if the respondent rated as "low" or "very low" the chance of having the Hepatitis B vaccine if they had to pay for it themselves, but rated a "medium" or higher chance of having it if

their employer paid, or if their employer paid and it was in tablet form (Questions 25 & 26). For example, of 38 respondents who rated as “low” or “very low” their chance of having the vaccine if they had to pay \$100 for it, 35 rated the chance as “medium” to “high” that they would have the vaccine if their employer paid (see Table 5).

**Table 5**

**Cost as a Barrier to Vaccination**

	Cost \$100 (n=38)	Cost \$50 (n=17)	Cost \$25 (n=7)
<b><u>Would have if employer paid for vaccine</u></b>			
very low	3	3	3
medium	3	1	1
high	2	0	0
very high	30	13	3
<b><u>Would have if vaccine in tablet form and employer paid</u></b>			
very low	2	2	2
medium	2	0	1
high	2	1	1
very high	32	13	3

**Note.** (n) is the number of people in each cost category who rated their chance of having the vaccine if they had to pay for it themselves as low or very low.

Cost was not considered to be the barrier to vaccination for those people represented by the shaded areas, because they would not have the vaccine even if their employer paid (the same people in both vaccine form categories, plus one in Question 25).

Question 12 asked those respondents who had declared no intention of commencing or completing the course of Hepatitis B vaccination (10) why they did not wish to be vaccinated. This question was not scored, but was used to validate earlier barrier questions. Table 6 gives a breakdown of responses.

Table 6

Reasons for Non-intention to Vaccinate

Reason for non-vaccination	Frequency
Not sure of vaccine safety	2
Not sure of vaccine effectiveness	2
Vaccine is too costly	2
Had Hepatitis B, now immune	1
Other	6

Of the 6 respondents who chose "other", 4 considered themselves to be at either no risk, or very low risk of being in contact with Hepatitis B, 1 said she "did not inject" (assumed to mean that she did not give injections to patients) and 1 had been pregnant and then breast feeding when offered vaccination. No respondent stated they were HBsAg positive.

Perceived safety and effectiveness of vaccine.

Most respondents considered the Hepatitis B vaccine to be both safe and effective. Table 7 shows a breakdown of responses regarding the chance of specific vaccine side effects occurring. Table 8 shows a breakdown of responses rating the effectiveness and safety of the Hepatitis B vaccine. Beliefs about general safety of vaccines were obtained in Question 29. Although nineteen (16.1%) had had personal experience or knowledge of

Table 7

% Rating Chance of Side Effects Occurring from Hepatitis B Vaccine

Side Effect	Very Low	Low	Medium	High	Very High
Catch Hepatitis B from vaccine	89.0	11.0	0	0	0
Get a sore arm	39.8	33.1	16.1	9.3	1.7
Get a mild fever	49.2	30.5	11.9	8.5	0
Get seriously ill from vaccine	80.5	18.6	0.8	0	0

Table 8

% Rating the Effectiveness and Safety of Hepatitis B Vaccine

Quality of Vaccine	Very Low	Low	Medium	High	Very High
Effectiveness of vaccine	0	0	11.9	51.6	36.4
Safety of vaccine	0	0.8	11.9	44.9	42.4

adverse effects from an injected vaccine, 87 respondents (73.7%) had had no such experience with, or knowledge of, adverse vaccine effects.

Individual scores for perceived safety and effectiveness of the Hepatitis B vaccine ranged from a minimum of 18.5 to a maximum of 31 ( $M = 27.21$ ,  $SD = 2.97$ ) from a possible range of 6-31. There was no significant difference between practice nurses in the vaccinated group ( $M = 4.28$ ,  $SD = 0.64$ ) and those in the non-vaccinated group ( $M = 4.13$ ,  $SD = 0.69$ ),  $t(116) = 0.96$ ,  $p = .338$ , in their belief in the ability of the vaccine to prevent Hepatitis B (effectiveness of the vaccine). However, practice nurses in the vaccinated group were significantly more likely to believe the Hepatitis B vaccine was safe ( $M = 4.39$ ,  $SD = 0.61$ ), than

nurses in the non-vaccinated group ( $M = 3.87$ ,  $SD = 0.92$ ),  $t(26.79) = 2.59$ ,  $p = .015$ . (Levene's Test for Equality of Variances was significant:  $[F(1,116) = 9.43$ ,  $p = .003]$ , therefore the  $t$ -test for unequal variances was used.)

There was no correlation between perceived threat and belief in vaccine effectiveness ( $r[116] = -0.117$ ,  $p = .209$ ) or between perceived threat and belief in vaccine safety ( $r[116] = -0.107$ ,  $p = .251$ ). However, there was a positive correlation between belief in vaccine safety and belief in vaccine effectiveness ( $r[116] = 0.587$ ,  $p < .001$ ).

### **Comments**

Comments about practice nursing and Hepatitis B were made by 23 respondents. Nine people said they had inadequate knowledge and needed more information about Hepatitis B. For example, "After answering this questionnaire I realise that I should know more about Hepatitis B than I do." However, one nurse said that "my practice is Paediatric . . . I never come into contact with needles etc.—but if I was in an Adult Practice I would have kept up to date with Hep. B information". Three practice nurses commented on the necessity for greater awareness of educational needs in the workplace, with one suggesting that if information was addressed to the "Practice Nurse" at medical centres "they (could) access it instead of the bin".

Three of four comments about universal precautions implied that the precautions they took depended on their "knowledge of (the) patient in question". One nurse thought it would be "beneficial to know the Hep. B status of known carriers. . . . [and] HIV +ve clients and Hep. C +ve clients". The issue of the Hepatitis B status of needlestick injury source patients was raised by two people. One source patient was "probably [negative] according to pts. doctor" and the other "Too long ago. Hep. B

was not an issue [then]. However, I was working in an operating theatre”.

### **Summary**

Most (80.5%) of this sample of 118 Western Australian practice nurses had been vaccinated against the Hepatitis B virus and seroconversion was confirmed in almost 75% of these. Use of universal precautions was largely appropriate with some disturbing exceptions and 61.9% reported having sustained a dirty needlestick injury at some time. More than half (57.6%) of the respondents had had no specific education regarding Hepatitis B infection in the previous 2 years. Knowledge about Hepatitis B transmission was not high, with an average score of 61.75% for that section of the questionnaire.

Beliefs about their susceptibility to Hepatitis B infection and the severity of the disease were in the middle range, so the perceived threat of contracting the disease from their workplace was also medium. Most people believed the vaccine was safe and effective and cost was not a barrier to vaccination for most.

Few differences were found between practice nurses in the vaccinated group and practice nurses in the non-vaccinated group. However, factors associated with positive vaccination status were a low perceived barrier score, a belief in the safety of the vaccine, and teaching about and administration of the vaccine to others, and knowledge of appropriate post-exposure actions. Significant findings in relation to the use of universal precautions were longer number of years as a practice nurse, Hepatitis B education in the previous 2 years, and increased perceived severity and perceived threat in participants with low indices of glove usage.

## **CHAPTER 6**

### **Discussion**

This correlational-descriptive study used the Health Belief Model as a framework to examine the methods used by a random sample of 200 practice nurses in Western Australia to protect themselves against Hepatitis B infection, and the extent their health beliefs about the disease contribute to those actions. Within this framework, the extent of knowledge about Hepatitis B transmission, and the proportion of practice nurses who sustained a needlestick injury during their working life was also determined.

Significant relationships were found between vaccination and teaching about and administering the vaccine to others, knowledge of appropriate post-exposure actions, a low perceived barrier score, and a high belief in vaccine safety. However, no association was found between vaccination and number of years as a registered nurse or as a practice nurse; knowledge of Hepatitis B transmission; Hepatitis B education in the previous 2 years; indices for glove usage; or in scores for perceived susceptibility to, perceived severity of, or perceived threat of the disease; or perceived benefits or perceived effectiveness of the vaccine.

Significant relationships were also found between high indices for glove usage and Hepatitis B education in the previous 2 years, and longer number of years as a practice nurse, and between low indices for glove usage and higher perceived severity and perceived threat scores. No association was found between glove usage and knowledge of Hepatitis B transmission, number of years as a registered nurse, or perceived susceptibility to the disease.

On the other hand, a significant relationship was found between perceived susceptibility and awareness of the disease in persons well known to participants, and between perceived susceptibility and



sustaining a dirty needlestick injury. Hepatitis B education in the previous 2 years had no association with perceived susceptibility, perceived severity, or perceived threat.

The following discussion looks at these and other findings in relation to the literature.

### **Vaccination**

In this study, although anecdotal evidence had suggested otherwise, 80.5% (95) of 118 respondents (59% of the sample) were vaccinated against Hepatitis B, with immunity confirmed in 74.5% (70) of those vaccinated. The most common reason given for vaccination (42%) was the suggestion by an employer that vaccination was appropriate. This is a much higher vaccination rate than is generally reported for nurses and health care workers (Bodenheimer et al., 1986; Briggs & Thomas, 1994; Burden & Whorwell, 1991; Hersey & Martin, 1994; McKenzie, 1992; Spence & Dash, 1990; Trevelyan, 1991). However, these findings are consistent with those of deVries (1994), Marles (1993), and Mundt (1992). Many participants in the studies by Marles, and Mundt, were involved in patient or staff vaccination, and Marles' suggestion that this factor may contribute to a higher than usual vaccination rate was supported by this study, where practice nurses who did teach about and administer the vaccine to others (50%) were significantly more likely to be vaccinated against Hepatitis B. On the other hand, Mundt's (1992) finding that younger, less experienced occupational health nurses were more likely to be vaccinated was not supported by this study of practice nurses. The question of booster requirements was not addressed by this study.

## **Use of Universal Precautions**

Use of universal precautions was measured in this study by the reported use of gloves when performing certain tasks and procedures. Although appropriate glove usage was reported by the majority of nurses for most procedures, limitations of the scoring method for these questions, and of unequal numbers performing various procedures, made it difficult to compare individual participants' scores. However, there were some disturbing findings in this section. Gloves were always worn when performing finger prick blood sugar levels by only 11.9% of 84 nurses, although the risk of skin contamination during the procedure is relatively high, and lancets are an identified "high risk" item (Bowden et al., 1993). Although gloves can be penetrated by lancets and other sharps, they do protect non-intact skin from contamination. Likewise, only 68.2% of 110 practice nurses always used gloves when cleaning used surgical instruments, and gloves were not routinely used by the majority of nurses when taking a blood sample, although this may be a reflection of their proficiency at venipuncture.

Although the percentage of nurses never recapping needles in this study (62.1%) was much higher than the 37% found by Willy et al. (1990), this was qualified by some respondents also choosing another option of handling used needle/syringe units such as "recap needle two-handed" or "use recapping device". Almost a quarter (22.4%) of respondents admitted to the unacceptable two-handed method of needle recapping, and 13.6% disconnected the needle from the syringe by hand before disposal.

A needlestick injury or blood splash had been sustained, at some time, by 61.9% (73) of respondents to this study. Differentiation was not made between injury received while working as a practice nurses or in another nursing area. The risk of bloodborne disease remains wherever

the injury occurs, but, for the purposes of this study it may have been more appropriate to ask about needlestick injury sustained while working as a practice nurses, or within a specific time frame (for example, within the previous two years). Although the two forms of injury were not separated, this finding is consistent with high rates of needlestick injury found by others (Burden & Whorwell, 1991; Grady et al., 1993; Marles, 1993; Spence & Dash, 1990; Troya et al., 1991). Willy et al. (1990) reported a much lower rate (24%), but this figure was related to injuries sustained in a 6 month period only. Disturbingly, only 54.2% of respondents in the present study were able to give appropriate actions to take if a needlestick injury occurred, and 19.5% said their actions would "depend on the patient", although 95.8% said they would report the injury to their employer. They were not, however, asked if needlestick injuries actually sustained were reported. Other studies (Burden & Whorwell, 1991; deVries & Cossart, 1994; Hersey & Martin, 1994; Spence & Dash, 1990) found that many exposures were not reported. However, reliance on their general practitioner employer to then take the appropriate action may be misplaced as Rich & Vickery (1994) found that, outside the hospital environment, the "sharps protocol" of screening blood tests on donor and recipient to determine the need for prophylaxis against Hepatitis B or HIV was rarely achieved. Immediate cleansing of the area was not included in the options for this question, but was given as another option by only 1 respondent.

Clearly, then, although the principles of universal precautions may be accepted by many practice nurses, compliance with guidelines needs to be improved. This supports earlier findings by Dajczman et al. (1992), Hersey and Martin, (1994), McCormick et al. (1991), and Willy et al. (1990).

## **Knowledge and Hepatitis B Education**

The level of knowledge about Hepatitis B transmission among practice nurses was not high in this study, and this is consistent with findings in other studies (Mundt, 1992; Spence & Dash, 1990; Troya et al., 1991). Like Mundt (1992), this study found no association between knowledge scores and vaccination. This study also found no association between knowledge scores and glove usage, supporting the conclusion of Willy et al. (1990), that "increased knowledge of transmission does not have a profound impact on behaviour" (p.355). Specific Hepatitis B education in the previous 2 years, although not associated with higher knowledge scores, or with vaccination, was found to be associated with significantly higher scores for glove usage.

This lack of knowledge about Hepatitis B transmission among nurses who are involved in teaching about and administering the vaccine is worrying. The possibility exists that these nurses are either giving limited or no information about Hepatitis B to their patients, or that wrong or misleading information is being given. This could have serious health and legal repercussions for patients, nurses, and their employers.

Of concern also, is that knowledge scores were not significantly altered by specific education on Hepatitis B and related issues. Self-education through journal articles was the most commonly cited method of gaining information about Hepatitis B. It is possible, therefore, that the articles in question did not contain the basic information needed, or that they were not readily understood by these nurses. No attempt was made to discover whether nursing or medical journals, or other media were the source of such articles.

### **Perceived Susceptibility, Severity and Threat**

In the present study, most practice nurses had low perceived susceptibility scores, although these were significantly higher in respondents who were aware of someone close to them with the disease and those who had sustained a dirty needlestick injury. Education about Hepatitis B in the previous 2 years, however, did not significantly increase perceived susceptibility. It is possible that the high vaccination rate among this sample of practice nurses contributed to their low perceived susceptibility to Hepatitis B, although no statistically significant relationship was found. Other studies, however, have found a positive relationship between perceived susceptibility and vaccine acceptance (Bodenheimer et al., 1986; Briggs & Thomas, 1994; Hersey & Martin, 1994; Mundt, 1992).

Perceived severity of Hepatitis B infection was in the medium range in this study, and was not associated with vaccination status, in keeping with Mundt (1992), but in contrast to Bodenheimer et al. (1986) who found high perceived severity positively associated with vaccine acceptance. Perceived threat score was also not associated with vaccination status.

This study found no association between perceived susceptibility scores and glove usage (use of universal precautions). This finding supports the conclusion by Grady et al. (1993) that perceived susceptibility to infection did not correlate with compliance with universal precautions guidelines. Willy et al. (1990), however, found that nurses who comply with universal precautions guidelines were more likely to perceive themselves at risk of Hepatitis B.

## **Perceived Benefits, Barriers and the Safety and Effectiveness of the Vaccine**

All but one respondent thought benefits would be gained from having the vaccine. Cost and vaccine form were not barriers for almost all respondents in this study, unlike earlier studies by Follett et al. (1987) and Grau (1991). Safety and effectiveness of the vaccine were also rated highly in this study, similar to findings by Briggs and Thomas (1994) and Mundt (1992), but this finding was in contrast to several other studies. Fear of serious side effects from the vaccine was found by several authors (Burden & Whorwell, 1991; Grau, 1991; Hersey & Martin, 1994; McKenzie, 1992; Patcher, 1988; Spence & Dash, 1990). Fear of AIDS and/or Hepatitis B from the vaccine was found by Follett et al., 1987; Patcher, 1988; and Spence & Dash, 1990. Fears about vaccine effectiveness were also found by Spence & Dash, 1990.

## **Limitations of the Study**

It may be possible to generalise the findings of this study to other practice nurses in Australia. However, enrolled nurses (E.N.s) also work in practices, often without registered nurse supervision, as do unregistered staff. Anecdotally, untrained staff also carry out nursing duties in some practices. However, in order to control for basic nursing education, this study was restricted to currently registered general nurses. The sample of 200 practice nurses was a true random sample, and the final response rate of 59% is considered to be representative of all practice nurses in Western Australia. However, inclusion of questions to elicit further demographic characteristics such as age, gender, marital status, and education would produce a better sample profile on which to base a judgement of sample representativeness.

Because of scoring limitations, use of universal precautions was not able to be properly compared to components of the Health Belief Model. Several factors contributed to this difficulty. The scales used for questions related to universal precautions established the use of gloves for the procedures undertaken by each individual, but did not distinguish between appropriate or inappropriate usage. Therefore, a high score for glove usage was not necessarily the ideal. A more suitable method of scoring would properly reflect the difference between appropriate and inappropriate glove usage. Moreover, Polit and Hungler (1989) assert that a major weakness of self-reporting techniques is the validity and accuracy of data as respondents may answer in what they assume to be the correct manner, rather than in a way that accurately reflects actual practice. However, for this study, it was assumed that the majority of respondents were candid in their replies, and that a reasonable assessment of their use of universal precautions was possible. A further difficulty was that not all respondents carried out all procedures. For example, only 33 respondents reported taking a Pap Smear. With hindsight, it may have been preferable to ask participants what they would do (rather than what they actually do) if they were required to perform each procedure. Although this would change the interpretation of results, individual scores would be assessed over an equal number of procedures and would thus be more meaningful.

## **CHAPTER 7**

# **Conclusions, Implications, Recommendations, and Implementation**

### **Conclusions**

This study found that practice nurses in Western Australia had a vaccination rate of 80.5% against Hepatitis B. This was much higher than that reported for most nurses and health care workers, but was consistent with other studies of nurses involved in teaching about and administering the Hepatitis B vaccine.

Compliance with universal precautions, on the other hand, although appropriate for a majority of respondents for most procedures and tasks specified, would appear, for some nurses, to be subjective. For example, 19.5% (23) of respondents declared that actions they would take following a needlestick injury would "depend on the patient". The decision may be on the basis of the presumed risk factors for an individual patient, or because of inadequate knowledge of Hepatitis B transmission. The knowledge level about Hepatitis B transmission among this group of practice nurses was not high, even among those who teach about and administer the vaccine. However, lack of knowledge of universal precautions guidelines themselves may be the basis of non-compliance.

The rate of needlestick injury or blood splash sustained during the nursing careers of this sample was high (61.9%), but consistent with other studies of nurses and health care workers. However, only slightly more than half (54.2%) of the respondents were able to nominate appropriate action to take if an occupational exposure occurred.

The results of this study showed that these practice nurses believed that there was only a low chance they would catch Hepatitis B, and they regarded the disease, if caught, as moderately severe. In the light of these findings, health beliefs about susceptibility to, and seriousness of,



Hepatitis B appear to have contributed little to practice nurses' actions to protect themselves against the disease.

However, at the time of the study, most participants were already vaccinated, and responses may have been given with regard to their presumed protected status. Nevertheless, compliance with universal precautions guidelines should be observed, regardless of immune status, because although it is the focus of this study, Hepatitis B is by no means the only significant bloodborne disease. In addition, the transmission of infections from nurses to patients may be a real risk.

The results of this study may be able to be generalised to other registered nurses who work in private medical and surgical practices in Australia. However, enrolled nurses, unregistered, and (anecdotally) untrained staff also carry out nursing duties in some practices, and it cannot be presumed that similar results would be obtained if these staff were included in the sample.

### **Implications**

Individual patient's risk factors or current status regarding Hepatitis B, or other bloodborne diseases may be unknown, therefore, lack of knowledge about Hepatitis B transmission, and lack of knowledge about, or compliance with, universal precautions guidelines on a practice nurse's part may expose her to infection. If, as seems possible from the results of this study, compliance with universal precautions is on a subjective basis of presumed risk from their knowledge of the patient, or the "look" of the patient, then nurses are doing themselves a disservice. Although the practice nurses in this study believed Hepatitis B to have only moderate severity, the disease could have substantial effect on the individual's health and employment prospects. There is currently no vaccination against HIV and Hepatitis C, so vaccination against

Hepatitis B does not negate the need for diligence in respect to compliance with universal precautions guidelines.

This study also found knowledge of appropriate post-exposure management to be disappointingly low. Given Rich & Vickery's (1994) conclusion that management of sharps injuries outside the hospital environment was inadequate, practice nurses who sustain an occupational exposure are at risk of developing bloodborne disease (including Hepatitis B) because proper screening to determine the need for prophylaxis may not be carried out. This is likely to be compounded by the fact that other studies have shown under-reporting of injuries.

The results of this study have serious implications, not only for practice nurses, but for nursing education and for the health of all Australians. Knowledge about transmission of Hepatitis B (and other bloodborne diseases), and compliance with universal precautions are essential for safe nursing practice. One in 1,000 Australians is an infectious carrier of the Hepatitis B virus (DOHSWA, 1990), so inadequacies in these areas may expose the practice nurse to the risk of infection and of transmission of the virus to other patients.

### **Recommendations**

The results of this study have led to recommendations in the areas of nursing education, future studies, and study replication.

#### **Nursing education.**

It is recommended that an educational programme, targeting practice nurses (and other non-hospital health care workers), be prepared, as a matter of urgency, by a panel of experts, including practice nurses, medical representatives, and infection control personnel. The programme should include:

- Provision of relevant educational material regarding transmission of the Hepatitis B virus and other bloodborne viruses for which there are no vaccines.
- Provision of relevant information regarding the benefits and risks of Hepatitis B vaccination.
- Provision of educational material regarding universal precautions guidelines.
- A protocol for post-exposure management for sharps injuries or other occupational exposures within a practice setting.

### **Future studies**

**a) Attitudinal study.** Information alone is not enough. To be successful, the programme must also address the attitudes of practice nurses towards Hepatitis B and other bloodborne diseases, and influence their behaviour to improve compliance with universal precautions.

To this end it is also recommended that a study be made of the attitudes of practice nurses to universal precautions to discover if they believe that universal precautions are effective in reducing the risk of bloodborne disease, and if they perceive a need for their use within general practice.

**b) Follow-up study.** Further, a follow-up study 6-12 months after the implementation of an educational programme would provide data about the acquisition and application of the information presented to this group of nurses. This would provide valuable information to nursing educators on the efficacy of programmes designed for non-hospital based nurses.

### **Replication of study.**

For a replication of this study, it is recommended that the following changes be made to the questionnaire.

- Consider inclusion of further demographic questions, for example, age, gender, marital status, and education to produce a better sample profile on which to base a judgement of sample representativeness.
- Modify Question 5 to make 2 questions instead of the current double-barrelled question asking if the job includes “teaching about and administration of Hepatitis B vaccine to others”.
- Reword Question 31 to “What do you think the chance of catching Hepatitis B is for an unvaccinated practice nurse?” Use this question to measure both knowledge and perceived susceptibility as in the Hepatitis B Vaccine Acceptance Questionnaire (Bodenheimer et al., 1986).
- Reword Question 62 (How do you handle a used needle/syringe unit before disposal?) to include the option “usually don’t recap needle”.
- Reword Question 65 to “Have you had a dirty needlestick injury while employed as a practice nurse?”
- Include a question asking if such an incident was reported.
- Consider changing scoring of universal precautions questions to reflect either appropriate or inappropriate replies. More meaningful comparisons could then be made.
- Consider changing universal precautions questions to ask participants what they would do (rather than what they actually do) if they were required to perform each procedure. Although this would change the interpretation, comparisons could be made between scores for all procedures.

Provision for observation of some nurses to validate reported use of universal precautions would also be valuable. This was not possible in

the current study because participants were anonymous and the researcher had no access to their names and addresses. Workplace observation would require consent by the practice nurses and their employers. However, potential problems with the "Hawthorne effect" would need to be considered. Approval and co-operation should also be sought from relevant medical associations.

### **Points to Consider for Implementation of Recommendations**

Due to the isolated nature of practice nurses' employment a variety of methods may need to be utilised to disseminate educational information. Seminars or lectures, although appropriate and relatively cheap methods of imparting information and encouraging behavioural change, are unlikely to reach the majority of practice nurses. An alternative could be the provision of a teaching video, with distribution on a loan basis, perhaps through professional organisations or pharmaceutical companies with an interest in the area.

Another approach could be information packages addressed to "The Practice Nurse" at each surgery listed in the commercial pages of city and country telephone directories. This method should reach most practice nurses. In addition, inclusion of material in nursing and medical journals (especially those with a wide general practice penetration) will provide essential information to other health professionals as well as reaching many practice nurses. Another alternative is the provision of a "consultancy" service available to practice nurses and other non-hospital health care workers. A pilot scheme providing a similar service for its clients is to be introduced by a local pathology service (G. Rich, personal communication, January 27, 1995).

However, this study found that knowledge about Hepatitis B transmission was not significantly higher among practice nurses who

reported specific education about Hepatitis B and related issues than among other practice nurses, although they did have higher scores for glove usage. Further, the most common source of specific education was self-education through journal articles. It may be that such articles assumed knowledge of basic information about Hepatitis B, or were not easily understood by these nurses. Careful evaluation of a pilot programme to ensure inclusion of basic information and lucidity would, therefore, be necessary before a full scale educational programme was set in place.

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## **Appendix A**

**Copy of letter from Dr. Gordon Rich.**

# Western Diagnostic Pathology

AME Medical  
Services Pty Ltd (APA)  
ACN 009 136 118

74 McCoy Street  
Myaree 6154  
Western Australia

Telephone (09) 317 1999  
Facsimile (09) 317 1536

1 November 1994

Ms. Helen Le Sueur  

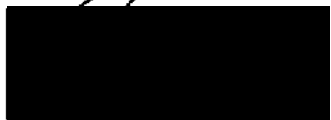

Dear Helen,

Please forgive me for not replying to you about the Hepatitis B questionnaire. I was away some weeks ago but did look at your project when I returned. I made some notes but then failed to take any further action.

This is a good questionnaire and should produce useful information. I do have problems with some questions. I realise that because of my dilatoriness it is probab'y too late. None the less, I will outline them:-

1. Questions 38, 39 and 40. If these were asked in the positive (i.e. HBV is likely to be present) then responders will not be confused by the double negative situation.
2. Questions 43 and 44. I think either true or false are reasonable answers. In particular, with question 43, infection of a sexual partner is a significant risk but transmission to other family members is possible but very unlikely.

We will be interested in your outcome, and, despite my tardiness, would be pleased to help in any way we can.

Yours sincerely,  


DR. GORDON RICH

*P.S. We did not write  
up the paper we gave at A/S  
Please find enclosed our slides  
and notes which you may  
find helpful.*

*G.*

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## **Appendix B**

### **Hepatitis B Awareness Questionnaire**



# Hepatitis B Awareness Questionnaire

*For each question, please circle the number which corresponds to your answer.*

- 1    What type of practice do you work in?                      General practice  
    Medical specialist practice  
    Surgical specialist practice
  
- 2    What nursing qualifications do you have?                    General  
    Midwifery  
    Child Health  
    Other (please specify) \_\_\_\_\_
  
3.    How many years have you worked as a Registered Nurse? \_\_\_\_\_
  
4.    How many years have you worked as a Practice Nurse? \_\_\_\_\_
  
5.    Does your job include teaching about and administration of Hepatitis B vaccine to others?  
    Yes  
    No
  
6.    Have you done any self-education or specific educational programme on Hepatitis B or related issues within the last two years? *(You may circle more than one response.)*  
    No, nothing specific  
    Day seminar/ workshop  
    Inservice workshop  
    Lecture/ guest speaker (at professional organisation)  
    Pertinent journal articles  
    Research articles/ reports/ presentations
  
7.    What benefits do you think you would gain from having the Hepatitis B vaccine? *(You may circle more than one response.)*  
    Protection from contracting Hepatitis B  
    I will not transmit the disease to others  
    It will help protect my family  
    No particular benefit
  
8.    Have you had the full course of 3 intramuscular injections of Hepatitis B vaccine?  
    Yes  
    *(Please go to Q. 9.)*  
    No  
    *(Please go to Q.11.)*
  
9.    If yes, why did you decide to be vaccinated against Hepatitis B?  
    Mass media coverage (radio, television, magazines)  
    Inservice training  
    Required by employer  
    Suggested by employer  
    Suggested by colleagues  
    Professional journal articles  
    Other, (please specify) \_\_\_\_\_  
    \_\_\_\_\_  
    \_\_\_\_\_

# Hepatitis B Awareness Questionnaire

10. Have you had a blood test to check your immunity to Hepatitis B (seroconversion)? *If additional injection(s) were required to seroconvert, and then confirmed by blood test, please answer (1).*

Yes, seroconversion confirmed  
 Yes, but did not seroconvert  
 Yes, but result unknown  
 No, did not have blood test

(please go to Q. 13.)

11. If you have not had the full course of 3 injections of Hepatitis B vaccine, have you:  
 Commenced and intend to complete the course?  
 Partially completed, but do not intend to complete the course?  
 Not started, but intend to have the course of vaccination?  
 No desire or intention to be vaccinated?

12. If you do not intend to commence or complete the course of Hepatitis B vaccination, why not?  
*(You may circle more than one response.)*

I do not like having injections  
 I am not sure of the safety of the vaccine  
 I am not sure of the effectiveness of the vaccine  
 The vaccine is too costly  
 I have had Hepatitis B and am now immune  
 I am Hepatitis B surface antigen (HBsAg) positive  
 Other (please specify)

*The following is a list of things that may happen to health care workers. Please indicate what you think the chances are that any of these may happen to you.*

What are the chances that:	Very Low	Low	Medium	High	Very High
13. You will catch Hepatitis B next year (if you do not have the disease now)?	1	2	3	4	5
If you did catch Hepatitis B, what are the chances that:					
14. You would need to be hospitalised?	1	2	3	4	5
15. You would miss work for more than 1 month?	1	2	3	4	5
16. Your life would be shortened?	1	2	3	4	5
17. You would become so ill that you die?	1	2	3	4	5
If you were vaccinated against Hepatitis B, what are the chances that you would:					
18. Catch Hepatitis B from the vaccine?	1	2	3	4	5
19. Get a sore arm?	1	2	3	4	5
20. Get a mild fever?	1	2	3	4	5

# Hepatitis B Awareness Questionnaire

	Very Low	Low	Medium	High	Very High
21. Get seriously ill from the vaccine itself?	1	2	3	4	5

Getting vaccinated for Hepatitis B requires three injections over a six month period of time. If you had to pay for the three injections, what are the chances that you would:

22. Get them if they cost \$100 for all three?	1	2	3	4	5
23. Get them if they cost \$50 for all three?	1	2	3	4	5
24. Get them if they cost \$25 for all three?	1	2	3	4	5

If the vaccination was paid for by your employer, what are the chances that you would:

25. Get all three injections?	1	2	3	4	5
-------------------------------	---	---	---	---	---

What if the vaccine were paid for by your employer and you could be vaccinated by taking 3 tablets instead of 3 injections. What are the chances that:

26. You would take the tablets?	1	2	3	4	5
27. How would you rate the ability of the Hepatitis B vaccine to prevent Hepatitis B?	1	2	3	4	5
28. How would you rate the safety of the Hepatitis B vaccine?	1	2	3	4	5

*Please circle the number corresponding to your response.*

29. Have you or any of your friends, co-workers or family members ever had a bad reaction from an injected vaccine?
- |            |   |
|------------|---|
| Yes        | 1 |
| No         | 2 |
| Don't know | 3 |
30. Have any of your friends, co-workers or family members ever had Hepatitis B?
- |            |   |
|------------|---|
| Yes        | 1 |
| No         | 2 |
| Don't know | 3 |
31. What do you think the chance of catching Hepatitis B is for a practice nurse?
- |                |   |
|----------------|---|
| 1 in 1,000     | 1 |
| 1 in 10,000    | 2 |
| 1 in 100,000   | 3 |
| 1 in 1,000,000 | 4 |
| Don't know     | 5 |
32. If a person catches Hepatitis B, how likely is it that s(he) will recover completely?
- |            |   |
|------------|---|
| 100%       | 1 |
| 80%        | 2 |
| 20%        | 3 |
| 1%         | 4 |
| Don't know | 5 |

## Hepatitis B Awareness Questionnaire

33. How long are most persons (excluding carriers) ill with Hepatitis B? (Include acute and convalescent phases)

- |            |   |
|------------|---|
| 2 days     | 1 |
| 2 weeks    | 2 |
| 4 months   | 3 |
| 1 year     | 4 |
| Don't know | 5 |

The following is a list of statements relating to Hepatitis B. Please circle the number corresponding to your response to each statement.

	True	False	Don't Know
34. You can catch Hepatitis B if you are stuck with a needle.	1	2	3
35. You can catch Hepatitis B through a cut in your skin.	1	2	3
36. You are unlikely to catch Hepatitis B through a blood transfusion in Australia.	1	2	3
37. Hepatitis B virus may be present in a person's blood.	1	2	3
38. Hepatitis B virus may be present in urine.	1	2	3
39. Hepatitis B virus may be present in saliva.	1	2	3
40. Hepatitis B virus may be present in vaginal fluid.	1	2	3
41. You may prevent Hepatitis B by good hand washing techniques.	1	2	3
42. You may prevent Hepatitis B by careful handling of needles and blood.	1	2	3
43. If you develop Hepatitis B you may give it to family members.	1	2	3
44. There is effective treatment for some cases of Hepatitis B infection.	1	2	3
45. You may develop Hepatitis B without any symptoms.	1	2	3

Please circle the number corresponding to your response. "N/A" (Not Applicable) is to be circled only if you never do the procedure or task in question.

When performing the following procedures or tasks, do you wear gloves:

	Never	Sometimes	Usually	Nearly Always	Always	N/A
46. Taking a blood sample	1	2	3	4	5	6
47. Collecting a urine sample from an incapacitated patient	1	2	3	4	5	6
48. Taking a Pap smear	1	2	3	4	5	6

# Hepatitis B Awareness Questionnaire

	Never	Sometimes	Usually	Nearly Always	Always	N
49. Collecting a sputum sample (holding the container)	1	2	3	4	5	6
50. Non-touch handling of a pathology specimen	1	2	3	4	5	6
51. Cleaning up a blood spill	1	2	3	4	5	6
52. Cleaning up a urine spill	1	2	3	4	5	6
53. Cleaning up a blood stained urine spill	1	2	3	4	5	6
54. Cleaning up a vomitus spill	1	2	3	4	5	6
55. Cleaning up a blood stained vomitus spill	1	2	3	4	5	6
56. Cleaning used surgical instruments	1	2	3	4	5	6
57. Dressing an open wound with non-touch technique	1	2	3	4	5	6
58. Assisting with a minor surgical procedure	1	2	3	4	5	6
59. Removing sutures	1	2	3	4	5	6
60. Giving an injection	1	2	3	4	5	6
61. Taking a finger prick blood sugar level	1	2	3	4	5	6

Please circle the number corresponding to your response.

62. How do you handle a used needle/ syringe unit before disposal? (You may circle more than one answer.)
- |   |   |
|---|---|
| Recap needle one handed                           | 1 |
| Recap needle two-handed                           | 2 |
| Use recapping device                              | 3 |
| Never recap needle                                | 4 |
| N/A - I do not handle needle/syringe units at all | 5 |
63. How do you dispose of a used needle/ syringe unit? (You may circle more than one answer.)
- |  |   |
|--|---|
| Discard unit into bin  | 1 |
| Discard unit into sharps container   | 2 |
| Disconnect needle from syringe by hand and place needle in sharps container and syringe into medical waste container | 3 |
| Disconnect needle from syringe using device on sharps container and discard syringe into medical waste container     | 4 |
| N/A - I do not handle needle/syringe units at all  | 5 |
| Other (please specify)   | 6 |

## Hepatitis B Awareness Questionnaire

- 
64. What immediate actions would you take if you sustained a needlestick injury in your workplace? *(You may circle more than one answer.)*
- |  |   |
|--|---|
| Depends on the patient   | 1 |
| Report the injury to my employer   | 2 |
| Request that blood be taken from the source patient (if possible) to determine status regarding Hepatitis B and other blood-borne diseases | 3 |
| Have my blood tested for HBsAg, or for immune level if immunised   | 4 |
| Commence Hepatitis B vaccination (if not immune)   | 5 |
| Nothing. I do not believe I am at risk   | 6 |
| Other <i>(please specify)</i>  | 7 |
- 
65. Have you *ever* had a dirty needlestick injury or a blood splash?
- |                              |   |
|------------------------------|---|
| Yes                          | 1 |
| <i>(please go to Q. 66.)</i> |   |
| No                           | 2 |
| <i>(please go to Q. 67.)</i> |   |
66. If yes, was the Hepatitis B status of the patient source:
- |          |   |
|----------|---|
| Negative | 1 |
| Unknown  | 2 |
| Positive | 3 |
67. What is the estimated rate of seroconversion in non-immunised personnel after a needlestick injury from a patient known to be Hepatitis B surface antigen (HBsAg) positive?
- |            |   |
|------------|---|
| 1 - 2%     | 1 |
| 5 - 10%    | 2 |
| 6 - 30%    | 3 |
| 30 - 50%   | 4 |
| Don't know | 5 |

Please add any comments you wish to make about Hepatitis B and practice nursing.

Thank you for your participation

## **Appendix C**

**Copy of letter from Henry C. Bodenheimer, Jr., M.D.**

**and**

**Hepatitis B Vaccine Acceptance Questionnaire**



The Mount Sinai Medical Center  
The Mount Sinai Hospital  
Mount Sinai School of Medicine

Henry C. Bodenheimer  
Associate Professor of Medicine  
Clinical Director, Division of  
Liver Diseases

One Gustave L. Levy Place  
New York, NY 10029-6574

Box 1039

Tel (212) 241-1424  
Fax (212) 996-5149

May 5, 1994

Helen Le Sueur, RN, RM, MRCNA  
University of Western Australia  
General Practice-Lockridge Pty Ltd

Western Australia

Dear Ms. Le Sueur:

You are welcome to use our scale in whole or in part in your clinical research evaluating acceptance of hepatitis B vaccine. To assess Health Belief, validated scales were used as referenced in our first paper. In addition to the published scales assessing Health Belief, we included a scale assessing hepatitis B knowledge. This was not standardized and was constructed by myself based on my knowledge of hepatitis B and hepatitis B vaccination. The same instrument was used before and after an educational intervention. Our instrument also included demographic information and our questionnaire was not independently validated.

I hope these comments are helpful to you in constructing your own instruments.

Sincerely,

Henry C. Bodenheimer, Jr., M.D.

HCB/ev





A new vaccine has been developed to prevent hepatitis B infection. This is a survey to find out what you think about this disease, the vaccine, and certain health matters in general. Your response is very important to us as we wish to obtain a representative view from all who work at the hospital. Your participation in this survey will, in no way, affect your receiving (or not receiving) the vaccine.

For Office  
Use Only

1. NAME \_\_\_\_\_

2. IDENTIFICATION NUMBER \_\_\_\_\_

For Office  
Use Only

3. HOSPITAL DEPARTMENT \_\_\_\_\_ (3) \_\_\_\_\_
4. RESPONDENT'S SEX      1. MALE      2. FEMALE      (4) \_\_\_\_\_
5. YEAR BORN \_\_\_\_\_ (5) \_\_\_\_\_
6. JOB TITLE \_\_\_\_\_ (6) \_\_\_\_\_
7. WHAT KIND OF WORK DO YOU DO? \_\_\_\_\_ (7) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
8. HOW MANY YEARS HAVE YOU WORKED FOR RHODE ISLAND HOSPITAL? \_\_\_\_\_ (8) \_\_\_\_\_
9. EDUCATIONAL BACKGROUND: (PLEASE CIRCLE YEARS OF SCHOOL ATTENDED) (9) \_\_\_\_\_
- | <u>Elementary</u> | <u>High School</u> | <u>College</u> | <u>Graduate</u> |
|-------------------|--------------------|----------------|-----------------|
| 8 or less         | 9, 10, 11, 12      | 13,14,15,16    | 17 or more      |

For Office  
Use Only

9a. Do you want to receive the vaccine? \_\_\_\_\_ (61) \_\_\_\_\_

9b. If not - why no? \_\_\_\_\_ (62) \_\_\_\_\_

THE FOLLOWING IS A LIST OF THINGS THAT MAY HAPPEN TO A PERSON. I WOULD LIKE YOU TO INDICATE WHAT YOU THINK THE CHANCES ARE THAT IT MAY HAPPEN TO YOU....DO YOU THINK THE CHANCES ARE VERY LOW, LOW, MEDIUM, HIGH, OR VERY HIGH.

	VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH	For Office Use Only
WHAT ARE THE CHANCES THAT:						
10. YOU CATCH HEPATITIS B NEXT YEAR?	1	2	3	4	5	(10) _____
IF YOU DID CATCH HEPATITIS B, WHAT ARE THE CHANCES THAT:						
11. YOU NEED TO BE HOSPITALIZED?	1	2	3	4	5	(11) _____
12. YOU MISS WORK FOR MORE THAN ONE MONTH?	1	2	3	4	5	(12) _____
13. YOUR LIFE IS SHORTENED?	1	2	3	4	5	(13) _____
14. YOU BECOME SO ILL THAT YOU DIE?	1	2	3	4	5	(14) _____
IF YOU WERE VACCINATED AGAINST HEPATITIS B, WHAT ARE THE CHANCES THAT:						
15. YOU CATCH HEPATITIS B?	1	2	3	4	5	(15) _____
16. YOU GET A SORE ARM?	1	2	3	4	5	(16) _____
17. YOU GET A MILD FEVER?	1	2	3	4	5	(17) _____
18. YOU GET SERIOUSLY ILL FROM THE VACCINE ITSELF?	1	2	3	4	5	(18) _____
GETTING VACCINATED FOR HEPATITIS B REQUIRES THREE INJECTIONS OVER A SIX-MONTH PERIOD OF TIME. WHAT IF YOU HAD TO PAY FOR THE THREE INJECTIONS? WHAT ARE THE CHANCES THAT:						
19. YOU GET THEM IF THEY COST \$100.00 FOR ALL THREE?	1	2	3	4	5	(19) _____
20. YOU GET THEM IF THEY COST \$50.00 FOR ALL THREE?	1	2	3	4	5	(20) _____
21. YOU GET THEM IF THEY COST \$25.00 FOR ALL THREE?	1	2	3	4	5	(21) _____

For Office  
Use Only

THE VACCINATION WILL BE PAID FOR BY THE  
RHODE ISLAND HOSPITAL. WHAT ARE THE  
CHANCES THAT:

VERY LOW  
LOW  
MEDIUM  
HIGH  
VERY HIGH

22. YOU GET ALL THREE INJECTIONS\_

1 2 3 4 5 (22) \_\_\_\_\_

WHAT IF THE VACCINATION WERE PAID FOR BY  
THE RHODE ISLAND HOSPITAL AND YOU  
COULD BE VACCINATED BY TAKING 3 PILLS  
INSTEAD OF 3 INJECTIONS? WHAT ARE THE  
CHANCES THAT:

23. YOU TAKE THE PILLS?

1 2 3 4 5 (23) \_\_\_\_\_

24. THE ABILITY OF THE HEPATITIS B  
VACCINE TO PREVENT HEPATITIS IS...

1 2 3 4 5 (24) \_\_\_\_\_

25. THE SAFETY OF THE HEPATITIS B  
VACCINE IS.....

1 2 3 4 5 (25) \_\_\_\_\_

PLEASE CIRCLE ONE RESPONSE

26. HAVE YOU OR ANY OF YOUR FRIENDS  
OR FAMILY MEMBERS EVER HAD A  
BAD REACTION FROM AN INJECTION?

(1) YES (2) NO

(26) \_\_\_\_\_

27. HAVE YOU OR ANY OF YOUR FRIENDS OR  
FAMILY MEMBERS EVER HAD HEPATITIS?

(1). YES (2) NO

(27) \_\_\_\_\_

28. WHAT DO YOU THINK THE CHANCE OF CATCHING  
HEPATITIS B IS FOR SOMEONE DOING YOUR  
JOB?

(28) \_\_\_\_\_

- a. 1 in 1,000
- b. 1 in 10,000
- c. 1 in 100,000
- d. 1 in 1,000,000

PLEASE CIRCLE ONE RESPONSE

29. IF A PERSON CATCHES HEPATITIS B, HOW  
LIKELY IS IT THAT HE WILL RECOVER  
COMPLETELY?

(29) \_\_\_\_\_

a. 100%

b. 80%

c. 1%

d. 20%

30. HOW LONG ARE PERSONS ILL WITH HEPATITIS B?

(30) \_\_\_\_\_

a. 2 DAYS

b. 2 WEEKS

c. 4 MONTHS

d. ONE YEAR

PLEASE CIRCLE TRUE OR FALSE

31. YOU CAN CATCH HEPATITIS B IF YOU ARE STUCK  
BY A NEEDLE.

(31) \_\_\_\_\_

(1) TRUE

(2) FALSE

32. YOU CAN CATCH HEPATITIS B THROUGH A CUT  
IN YOUR SKIN.

(32) \_\_\_\_\_

(1) TRUE

(2) FALSE

33. YOU CAN CATCH HEPATITIS B BY RECEIVING  
A BLOOD TRANSFUSION.

(33) \_\_\_\_\_

(1) TRUE

(2) FALSE

34. HEPATITIS B VIRUS MAY BE IN BLOOD.

(34) \_\_\_\_\_

(1) TRUE

(2) FALSE

35. HEPATITIS B VIRUS MAY BE IN URINE.

(35) \_\_\_\_\_

(1) TRUE

(2) FALSE

36. HEPATITIS B VIRUS MAY BE IN SALIVA.

(36) \_\_\_\_\_

(1) TRUE

(2) FALSE

37. HEPATITIS B VIRUS MAY BE IN VAGINAL FLUID.

(37) \_\_\_\_\_

(1) TRUE

(2) FALSE

38. YOU MAY PREVENT HEPATITIS B BY GOOD HAND  
WASHING TECHNIQUES.

(38) \_\_\_\_\_

(1) TRUE

(2) FALSE

PLEASE CIRCLE TRUE OR FALSEFor Of  
Use Or39. YOU MAY PREVENT HEPATITIS B BY CAREFUL  
HANDLING OF NEEDLES AND BLOOD.

(39) —

(1) TRUE

(2) FALSE

40. IF YOU DEVELOP HEPATITIS B, YOU MAY GIVE  
IT TO YOUR FAMILY MEMBERS.

(40) —

(1) TRUE

(2) FALSE

41. THERE IS EFFECTIVE TREATMENT FOR HEPATITIS B  
INFECTION.

(41) —

(1) TRUE

(2) FALSE

42. YOU MAY DEVELOP HEPATITIS B WITHOUT ANY  
SYMPTOMS.

(42) —

(1) TRUE

(2) FALSE

THE FOLLOWING IS A LIST OF BELIEFS  
WHICH DIFFERENT PEOPLE MAY HOLD  
ABOUT HEALTH-RELATED ISSUES. I  
WOULD LIKE YOU TO INDICATE THE  
EXTENT TO WHICH YOU DISAGREE OR  
AGREE WITH EACH STATEMENT.

STRONGLY DISAGREE  
MODERATELY DISAGREE  
SLIGHTLY DISAGREE  
SLIGHTLY AGREE  
MODERATELY AGREE  
STRONGLY AGREE

43. IF I GET SICK, IT IS MY OWN  
BEHAVIOR WHICH DETERMINES HOW  
SOON I GET WELL AGAIN

1 2 3 4 5 6

(43) —

44. NO MATTER WHAT I DO, IF I AM  
GOING TO GET SICK, I WILL  
GET SICK.

1 2 3 4 5 6

(44) —

45. HAVING REGULAR CONTACT WITH MY  
PHYSICIAN IS THE BEST WAY FOR  
ME TO AVOID ILLNESS.

1 2 3 4 5 6

(45) —

46. MOST THINGS THAT AFFECT MY  
HEALTH HAPPEN TO ME BY  
ACCIDENT.

1 2 3 4 5 6

(46) —

	STRONGLY DISAGREE	MODERATELY DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	MODERATELY AGREE	STRONGLY AGREE	For Office Use Only
47. WHENEVER I DON'T FEEL WELL, I SHOULD CONSULT A MEDICALLY TRAINED PROFESSIONAL	1	2	3	4	5	6	(47) _____
48. I AM IN CONTROL OF MY HEALTH	1	2	3	4	5	6	(48) _____
MY FAMILY HAS A LOT TO DO WITH MY BECOMING SICK OR STAYING HEALTHY	1	2	3	4	5	6	(49) _____
50. WHEN I GET SICK I AM TO BLAME	1	2	3	4	5	6	(50) _____
51. LUCK PLAYS A BIG PART IN DETERMINING HOW SOON I WILL RECOVER FROM AN ILLNESS	1	2	3	4	5	6	(51) _____
52. HEALTH PROFESSIONALS CONTROL MY HEALTH	1	2	3	4	5	6	(52) _____
53. MY GOOD HEALTH IS LARGELY A MATTER OF GOOD FORTUNE	1	2	3	4	5	6	(53) _____
54. THE MAIN THING WHICH AFFECTS MY HEALTH IS WHAT I MYSELF DO.	1	2	3	4	5	6	(54) _____
55. IF I TAKE CARE OF MYSELF, I CAN AVOID ILLNESS	1	2	3	4	5	6	(55) _____
56. WHEN I RECOVER FROM AN ILLNESS, IT'S USUALLY BECAUSE OTHER PEOPLE (for example. doctors, nurses, family, friends) HAVE BEEN TAKING GOOD CARE OF ME	1	2	3	4	5	6	(56) _____
57. NO MATTER WHAT I DO, I'M LIKELY TO GET SICK	1	2	3	4	5	6	(57) _____
58. IF IT'S MEANT TO BE, I WILL STAY HEALTHY	1	2	3	4	5	6	(58) _____
59. IF I TAKE THE RIGHT ACTIONS, I CAN STAY HEALTHY	1	2	3	4	5	6	(59) _____
60. REGARDING MY HEALTH, I CAN ONLY DO WHAT MY DOCTOR TELLS ME TO DO	1	2	3	4	5	6	(60) _____



Thank you very much for your cooperation. As I said before we started, your response helps assure a representative view of opinions on these important health matters, and will supply information to better plan future health programs.

The hospital is about to offer an employee information program to acquaint all employees with their risk of contracting hepatitis B, as well as data on the new vaccine. You will be considered for vaccination depending on your chance of contracting hepatitis B as a result of your employment. This questionnaire will not influence that consideration. Again thank you.

## **Appendix D**

**Copy of fax from Ms Donna Mundt**

**Adaptation of Hepatitis B Vaccine Acceptance  
Questionnaire**

**and**

**Documentation of Scoring for Instrument**



**FAMILY HEALTH NETWORK**  
of Central New York, Inc.

Administrative Office  
35 Main Street  
Cortland, NY 13804  
607/753-3797

FAX TRANSMITTAL

FROM DeNA MUNDT

TO HELEN LESUEUR

COMPANY U.W. AUSTRALIA

CITY \_\_\_\_\_

NUMBER OF PAGES (INCLUDING TRANSMITTAL) 10

PHONE: (607) 849-3271

FAXNUMBER (607) 849-6357

COMMENT: Good luck, Helen. If you need more info,  
let me know.

\*\*\*\*\*

CONFIDENTIALITY NOTE:

The information which follows and is transmitted herewith is confidential information. It is intended only for the viewing and use of the individual recipient named above. If the reader of this message is not the intended recipient you are notified that any review or communication is strictly prohibited.

If you have received this communication in error, please immediately notify us by telephone at the above number and feel free to make the call collect.

Thank you

103

Marathon Medical and Dental Centers  
North Main Street  
Marathon, NY 13040  
607/863-4126 (Medical)  
863-6520 (Dental)

DeRuyter Medical Center  
Box 364, Route 13  
DeRuyter, NY 13052  
315/852-3218

Georgetown Health Center  
Route 26 North  
Georgetown, NY 13072  
315/837-4402

Marathon Medical and Dental Center  
22-24 East Main Street  
Marathon, NY 13803  
607/849-3272 (Medical)  
849-3294 (Dental)

Appendix C  
Hepatitis B Vaccine Acceptance Questionnaire

1.

HEPATITIS SURVEY  
DEMOGRAPHIC DATA

1. Identification number: \_\_\_\_\_
2. Gender: Male \_\_\_\_\_ Female \_\_\_\_\_
3. Age: \_\_\_\_\_ 4. Job Title: \_\_\_\_\_
5. Type Hospital (e.g. trauma, nursing home, etc.): \_\_\_\_\_  
Describe setting (e.g. inner city, urban, rural, suburban) \_\_\_\_\_
6. Does your job include teaching and administration of HB vaccine to employees? \_\_\_\_\_
7. How long have you worked in Hospital Employee Health? \_\_\_\_\_
8. Educational background: (Please circle years of school attended and highest degree)  
College: 13, 14, 15, 16 Graduate: 17 or more  
Highest Degree held: AD Diploma BSN MSN PhD Other \_\_\_\_\_
9. Have you ever had a dirty needlestick or blood splash? \_\_\_\_\_  
If so, was the patient source known positive for Hepatitis B? \_\_\_\_\_
10. Have you had the Hepatitis B vaccine? \_\_\_\_\_
11. If not, why? \_\_\_\_\_

2.

HEPATITIS STUDY

The following is a list of things that may happen to health care workers. Please indicate what you think the chances are that it may happen to you.

What are the chances that:	Very Low	Low	Medium	High	Very High
13. You catch Hepatitis B next year (when you are Anti HBs negative)?	1	2	3	4	5
If you did catch Hepatitis B, what are the chances that?					
14. You need to be hospitalized?	1	2	3	4	5
15. You miss work for more than 1 month?	1	2	3	4	5
16. Your life is shortened?	1	2	3	4	5
17. You become so ill that you die?	1	2	3	4	5
If you were vaccinated against Hepatitis B, what are the chances that:					
18. You catch Hepatitis B?	1	2	3	4	5
19. You get a sore arm?	1	2	3	4	5
20. You get a mild fever?	1	2	3	4	5
21. You get seriously ill from the vaccine?	1	2	3	4	5
Getting vaccinated for Hepatitis B requires three injections over a six month period of time. If you had to pay for the three injections, what are the chances that:					
22. You get them if they cost \$100 for all three?	1	2	3	4	5
23. You get them if they cost \$50 for all three?	1	2	3	4	5
24. You get them if they cost \$25 for all three?	1	2	3	4	5

3.

# HEPATITIS STUDY

The vaccination is paid for by your hospital.

What are the chances that:

Very Low Low Medium High Very High

25. You get all three injections?

1 2 3 4 5

What if the vaccine were paid for by your hospital and you could be vaccinated by taking 3 pills instead of 3 injections. What are the chances that:

26. You take the pills?

1 2 3 4 5

27. The ability of the Hepatitis B vaccine to prevent Hepatitis is.....

1 2 3 4 5

28. The safety of the Hepatitis B vaccine is...

1 2 3 4 5

29. How would you rate the acceptance rate for Hepatitis B vaccine by employees at your hospital?

1 2 3 4 5

## PLEASE CIRCLE ONE RESPONSE

30. Have you or any of your friends, co-workers or family members ever had a bad reaction from an injection?

(1) Yes

(2) No

31. Have you or any of your friends, co-workers or family members ever had Hepatitis?

(1) Yes

(2) No

32. What do you think the chances of catching Hepatitis B is for someone doing your job?

(a) 1 in 1,000

(b) 1 in 10,000

(c) 1 in 100,000

(d) 1 in 1,000,000

33. If a person catches Hepatitis B, how likely is it that (s)he will recover completely?

(a) 100%

(b) 80%

(c) 1%

(d) 20%

4.

## HEPATITIS STUDY

34. How long are persons ill with Hepatitis B?

- (a) 2 days
- (b) 2 weeks
- (c) 4 months
- (d) 1 year

### PLEASE CIRCLE TRUE OR FALSE

- |   |          |           |
|---|----------|-----------|
| 35. You can catch Hepatitis B if you are stuck with a needle.             | (1) True | (2) False |
| 36. You can catch Hepatitis B through a cut in your skin.                 | (1) True | (2) False |
| 37. You can catch Hepatitis B through a blood transfusion.                | (1) True | (2) False |
| 38. Hepatitis B virus may be in the blood.                                | (1) True | (2) False |
| 39. Hepatitis B Virus may be in the urine.                                | (1) True | (2) False |
| 40. Hepatitis B may be in the saliva.                                     | (1) True | (2) False |
| 41. Hepatitis B virus may be in vaginal fluid.                            | (1) True | (2) False |
| 42. You may prevent Hepatitis B by good hand washing techniques.          | (1) True | (2) False |
| 43. You may prevent Hepatitis B by careful handling of needles and blood. | (1) True | (2) False |
| 44. If you develop Hepatitis B, you may give it to family members.        | (1) True | (2) False |
| 45. There is effective treatment for Hepatitis B infection.               | (1) True | (2) False |
| 46. You may develop Hepatitis B without any symptoms.                     | (1) True | (2) False |

### Study Instrument

The study instrument used in this research was the Hepatitis B Vaccine Acceptance Questionnaire (HBVAQ) which was developed by Henry C. Bodenheimer, Jr., MD, John P. Fulton, PhD, and Peter D. Kramer, MD (see appendix B), for their study of the acceptance of Hepatitis B vaccine among hospital workers (Bodenheimer, et.al., 1986, 252-255). They used the HBM as the construct for their study and developed a sixty two item questionnaire to measure variables within that model. Information obtained included age, sex, job description, years of employment, highest grade completed in school, knowledge of hepatitis B, desire to be vaccinated, perception of likelihood of subject contracting hepatitis B, and the perception of severity of HBV infection for subjects. Three health locus of control scales (powerful others, internal, and chance) were also assessed (Bodenheimer, et.al., 1986, 252). Personal interviews were conducted using the questionnaire in their case. Coefficient alpha ranges were 0.49 for susceptibility to hepatitis B, 0.77 for severity of hepatitis B, 0.69 for safety and effectiveness of vaccine, 0.82 for discomfort of vaccine and 0.52 for knowledge of hepatitis B. The values of alpha calculated for susceptibility to hepatitis B (0.49) and for knowledge of hepatitis B (0.52) scales were lower than the authors would have preferred but both scales were used in their analysis because this effect biases results conservatively (Bodenheimer, et.al., 1986, 252-253).

In this study, the locus of control scales were not included in the questionnaire since the main focus of the research was on perceptions of threat and knowledge level of the sample population and other variables within the HBM, not on sources of control of actions, i.e., "powerful others", "internal" or "chance". Demographic information was obtained in questions 1 - 8 and included age, sex, job title, type hospital and setting, years worked in hospital employee health, years of education and highest degree held, and whether or not the participant's job involved teaching about and administration of HB



vaccine to employees. A question was added which asked the participant to rate the acceptance rate for HB vaccine acceptance at their hospital. This was not used to score for any of the variables. The same questions to assess for acceptance of HB vaccine, severity of hepatitis B, susceptibility to hepatitis B, safety and effectiveness of the vaccine and knowledge of hepatitis B were used (see appendix C) and scored in the following manner :

Motivation: In this research, the dependent variable of motivation was operationally defined as acceptance of the HB vaccine, whereas Bodenheimer, et.al., defined their dependent variable as the stated intention of receiving the HB vaccine (Bodenheimer, et.al., 1986, 252). Question 10 in the questionnaire used in this research asked if the participant has had the HB vaccine. A score of 1 was given if the answer was yes, and 0 if the answer was no. Question 11 asked why the participant had not had the vaccine to assist with clarification of intentions.

Susceptibility: Question 9, asking whether or not the participant had ever had a dirty needlestick or blood splash, was added to score for perceived susceptibility. A score of 1 was given if the answer was yes, a score of 0 if the answer was no, because it was presumed that the actuality of exposure to blood and body fluids would increase perceived susceptibility to HBV infection. Question 13 was scored by asking the participant to rank their chances of catching hepatitis B next year from "very low" to "very high" on a scale from 1 to 5, 1 being very low and 5 being very high. Question 31, "have you or any of your friends, co-workers or family members ever had hepatitis?", was scored 1 if the subject answered yes, 0 if the answer was no, because it was presumed that actual awareness of hepatitis infection in a close acquaintance would increase perceived susceptibility. Question 32 asked about the participants chances of catching hepatitis B for someone doing their job. There were four possible answers with the response of "1 in 1000" scoring 4, "1 in 10,000" scoring 3, "1 in 100,000" scoring 2 and "1 in 1,000,000" scoring 1. According to Bodenheimer, et. al., high risk health care workers would have a "1 in 10,000" chance of acquiring HBV infection through occupational exposure. Hospital

employee health nurses are in this group also if they perform phlebotomy on and give injections and first-aid nursing care to health care workers (who are considered to be a higher risk for being HB carriers, as discussed earlier). Scores for perceived susceptibility had a possible range of 2 (low perceived susceptibility) to 11 (high perceived susceptibility).

Severity: Questions 14, 15, 16, and 17 were scored from "very low" to "very high" on a scale of 1 - 5, 1 being very low and 5 being very high. Scores had a possible range of 4 (low perceived severity of hepatitis B) to 20 (high perceived severity). For example, a score of 4 or 5 on the question, "If you did catch Hepatitis B, what are the chances that you become so ill that you die?", would reflect very high perceived severity of HBV infection.

Perceived Threat: The scores for the subject's perceived susceptibility and perceived severity were combined to assess for perceived threat. The scores had a possible range from 6 (low perceived threat) to 31 (high perceived threat).

Safety and Effectiveness of HB Vaccine: Questions 18, 19, 20, 21, 27 and 28 were scored for the subject's assessment of the safety and effectiveness of this vaccine. For questions 18 - 21, scoring was reversed. On a scale of 1 - 5, the respondent was asked to rate the chances of experiencing certain side effects from the HB vaccine, 1 being very low and 5 being very high. If the respondent rated the chance of side effects as low, this was given a higher score indicating perception of higher safety and effectiveness for the vaccine. Questions 27 and 28 were scored as answered on the questionnaire so that an answer of 4 or 5 on the question, "the ability of the Hepatitis B vaccine to prevent Hepatitis is?", would indicate the vaccine had high or very high ability to prevent HBV infection, and is, thus, very effective. The same scoring was employed for question 28 regarding the safety of the Hepatitis B vaccine. In addition, question 30 addressed safety of the vaccine, and was scored 0 if the subject answered yes to this question, "have you or any of your friends, co-workers, or family members ever had a bad reaction from an injection?", and 1

if the answer was no. Again, it was presumed that individuals who have not had personal knowledge of self, friends or relatives having bad experiences with vaccines, would be more likely to feel that vaccines, in general, are safe. These seven questions scored a possible range from 6 to 31, 6 indicating very low safety and effectiveness of the vaccine and 31 indicating very high safety and effectiveness.

Barriers - Cost, Injection: Questions 22 through 26 were also answered by ranking responses from 1 - 5. In the first three questions in this series, the scoring was reversed, however, since cost would not be a barrier if the chances were high that the subject would still accept the vaccine. For example, an answer of 5 (very high chance that the subject would get the vaccine if it cost \$100) indicated cost is not a barrier, and the score would be 1. An answer of 1 indicated this was not a barrier and was scored 5. The higher the score, the higher the perceived barrier of cost. Questions 25 and 26 were scored with 1 being low and 5 being very high, as in the usual case. If the vaccine is free, or if it is in pill form, and the subject answered that their chances are still very low of taking it, cost and injection-form were not perceived as barriers. If the subject's answer was higher, indicating higher likelihood of taking the vaccine if it is free or if it is in pill form, and it was scored as a barrier in questions 22 - 26, this indicated most strongly that cost or injection-form were barriers.

Knowledge level: Questions 32 through 46 were designed to determine knowledge level about hepatitis B. Each correct answer was scored 1. No score was given for incorrect answers. Therefore, a range of 0 (very low level of knowledge about hepatitis B) to 15 (high level of knowledge about hepatitis B) was possible. Questions 32 and 33 were correctly answered by giving answer (b). Question 34 was correctly answered by giving answer (c). In questions 35 - 46, all answers were true except questions 42 and 45. The correct responses for knowledge questions were confirmed with Dr. Fulton.

The forty six item HBVAQ, as used in this study, was adapted by obtaining demographic data so that it is specific for this sample population of hospital employee health nurses. A question was added to measure susceptibility which asked whether or not

the subject had ever had a dirty needlestick or blood splash. Also, a second question was added concerning the HB acceptance rate by employees at the subject's hospital. This was added to analyze whether there is correlation between the subject's perceptions of HB infection and the HB vaccine safety and the acceptance rate by employees in the subject's work setting, to whom he or she administers the vaccine.

### Data Collection

The HBVAQ was mailed to the sample population in this study since personal interviews were not possible. Questionnaires were mailed to a convenience sample of 205 registered nurses in forty four states and Ontario, Canada, who are members of AAOHN and also members of the AAOHN specialty group known as Hospital/Medical Center. An explanatory letter accompanied the questionnaire and introduced the nurse to the purpose of this research project (see appendix D). Each potential participant was invited to take part in this research project and was informed of the maintenance of confidentiality, and that participation would in no way affect membership in the AAOHN. One hundred questionnaires were returned, but eight of these were not practicing as hospital employee health nurses. Of those who responded, hospital employee health nurses from thirty six states across the United States, and Ontario, Canada, were represented in this sample.

### Data Analysis

Ordinal level data on independent variables was collected for this research and scored to provide interval level data. The dependent variable, acceptance of HB vaccine, was nominal level data. Therefore, analysis was done using Probit method to determine Maximum Likelihood Estimates. This regression analysis technique enabled statistical analysis to determine the significance of the relationship between the variables of perceived

## **Appendix E**

### **Scoring for the Hepatitis B Awareness Questionnaire**

## **Scoring for the Hepatitis B Awareness Questionnaire**

The scoring for much of this instrument has been taken from documentation used by Mundt (1992) for her adaptation of the Hepatitis B Vaccine Acceptance Questionnaire and kindly supplied by Ms Mundt.

### **Demographics**

Demographic information was obtained in Questions 1-5 and was not scored. This included type of practice, nursing qualifications held, how many years respondents had worked as a registered nurse and specifically as a practice nurse, and if their job included teaching about and administration of Hepatitis B to others.

### **Action**

Question 8 in the Hepatitis B Awareness Questionnaire asked participants if they had had the full course of 3 intramuscular injections of Hepatitis B vaccine. This was rated 1 if the answer was "yes" and 0 if the answer was "no". (Participants who answered in the affirmative were directed to Question 9, others to Question 11.) Question 10 asked respondents if they had had a blood test to check immunity to Hepatitis B (sero-conversion). Four possible answers were given and were rated 1-4. Only the first (1) confirmed effective vaccination. (Respondents to this question were directed to Question 13.) In Question 11, respondents who had not had the full course of 3 intramuscular injections of Hepatitis B vaccine (Question 8), were asked about their intentions regarding vaccination. Four possible answers were given and rated 1-4. These questions about vaccination were not scored.

Questions about use of universal precautions were added by this researcher and were scored in the following manner: Respondents were

asked to rate how often they wore gloves for a series of procedures and tasks in Questions 46-61. These questions were ranked from 1-6, but scored 1-5, with 1 being "never" wear gloves, to 5 being "always" wear gloves. If the procedure was never performed by the respondent, it was ranked "N/A" (not applicable) and given a value of 6, but not scored. "Missing" data were given a value of 99, but also not scored. A nurse who performed all 16 procedures and "always" wore gloves for each procedure would score the possible maximum of 80. However, it is not necessary to always wear gloves for all procedures. For example, removal of sutures rarely necessitates the use of gloves.

- A score was calculated for each participant to allow for different procedures being done by different nurses. The method of calculating the score is shown in the following example. Suppose a nurse reported that she performed 11 of the 16 procedures, that she never performed 4 procedures, and the final procedure was assigned as a missing value. She wore gloves "always" for 9 procedures, "never" for 1 procedure, and "sometimes" for the remaining procedure. Her score would look like this:

5 5 5 6 5 5 5 1 6 6 5 2 6 5 5 99 (55) (48) (.87)

The maximum possible score for this participant was 55. This was calculated by subtracting the maximum possible score for the number of "not applicables" (value of 6) and the maximum possible score for the number of "missing" (value of 99) values from the overall possible score of 80. (each procedure could score a possible 5). That is,

$$80 - (4 \times 5) - (1 \times 5) = 55$$

The real score for this individual (48) was calculated by adding all values shown and then subtracting the combined value of all "not applicables" and the combined value of all "missing" values. That is,

$$(\text{var.1} + \text{var.2} \dots + \text{var 16}) - (\text{n/a} \times 6) - (\text{missing} \times 99)$$

$$171 - (4 \times 6) - (1 \times 99) = 48$$

An index of glove usage for the procedures undertaken by this participant was calculated by dividing the real score by the possible score. That is,

$$48 \div 55 = .87$$

Respondents were asked what immediate actions they would take if they sustained a needlestick injury in their workplace in the final question. More than one response was allowed. Responses 1 (depends on the patient) and 6 (nothing, I do not believe I am at risk) were unacceptable choices. Responses 2,3 and 4 or 5 were appropriate choices. An option to detail other actions was given.

### **Knowledge**

Knowledge about Hepatitis B virus was measured by Question 31-45 and Question 67 which was added for this study. Each correct answer scored 1, each incorrect answer scored 0. The option "don't know" was added for this study and also scored 0. The correct answer for Questions 31 and 32 was option 2. According to Bodenheimer et al., (1986) "high risk health care workers would have a "1 in 10,000" chance of acquiring HBV infection through occupational exposure" (cited by Mundt, 1992). Practice nurses who perform phlebotomy, finger prick blood testing, or carry out first-aid on high risk patients can be included in this group. Question 33 was correctly answered by option 3. Question 34-45 were all true except Question 41. Question 36 was changed to reflect Australian conditions, and Question 44 was changed to reflect new treatment options. Question 67 was added to determine if practice nurses knew the estimated rate of sero-conversion in non-immunised personnel after a



needlestick injury from a known HBsAg positive patient. The correct answer is option 3. A range of 0 (very low level of knowledge) to a high of 16 (high level of knowledge about Hepatitis B) was possible.

### **Perceived susceptibility**

Question 65 asked if the participant had ever had a dirty needlestick injury or a blood splash and was added by Mundt (1992) to measure perceived susceptibility to the Hepatitis B virus. She presumed that the circumstance of actual exposure to blood or body fluids would increase perceived susceptibility to infection, therefore, "yes" was scored 1 and "no" was scored 0. Question 66 was added for this study to determine if the Hepatitis B status of the source patient was known. A positive source patient was assumed to further increase perceived susceptibility and was scored 2, an unknown source was assumed to somewhat increase perceived susceptibility and was scored 1. On the other hand, a known HBsAg negative source patient would not increase perceived susceptibility above that of Question 65 and was therefore scored 0. For example, a nurse who received a needlestick injury from a source with an unknown Hepatitis B status would score a total of 2 over the two questions.

Question 13 asked participants to rate their chances of catching Hepatitis B next year on a scale of 1-5 where 1 was very low and 5, very high. Question 30 asked if any of a participant's friends, co-workers or family have ever had Hepatitis B. This was scored 1 if the answer was "yes" and 0 if "no". "Don't know" was added after the pilot study to prevent a forced choice between "yes" and "no". This was scored 0.5 It was presumed that a sense of personal risk (susceptibility) would increase in participants if someone well known to them had contracted

Hepatitis B. Scores for perceived susceptibility could range from a low of 1 to a high perceived susceptibility of 9.

### **Perceived Severity**

Participants' perceived severity of Hepatitis B infection was determined by Questions 14-17. These were scored on a 5 point scale with 1 being very low and 5 being very high. For example, a participant who regarded Hepatitis B as a very serious disease from which one could die might rate Question 17 with a 4 or 5, thus reflecting a very high perceived severity. Scores for perceived severity could range from a low of 4 to a high perceived severity of 20.

### **Perceived threat**

Perceived threat was calculated by the addition of individual scores for perceived susceptibility to, and perceived severity of Hepatitis B infection. Possible scores ranged from a low of 5 to a high of 29.

### **Motivators**

Question 6, which asked about specific education regarding Hepatitis B within the previous two years, and Question 9, which asked why the participant decided to have the vaccine were added to discover the reasons for acceptance of Hepatitis B vaccine and/or use of Universal Precautions. These questions were not scored.

### **Perceived benefits**

Question 7 was added to determine what benefits participants thought would be gained from having the Hepatitis B vaccine. More than one response could be chosen from the four options given. Options 1,2 and 3 were scored 1, but option 4 "no particular benefit" was scored 0.

Option 2, "I will not transmit the disease to others" is not a true benefit, but if chosen by respondents is perceived as a benefit and, therefore, scored as such. Possible scores ranged from 0-3.

### **Perceived barriers**

Questions 22-24 assessed cost as a barrier to vaccination rated on a scale of 1-5. The scoring was reversed in these questions, however, as cost would not be a barrier if the chances were high that a respondent would still accept the vaccine. The higher the score, the higher the perceived barrier of cost. Questions 25 and 26 were scored as on the questionnaire. If a participant rated their chances of having the vaccine as low even if the vaccine was free or in tablet form, cost and vaccine form were not perceived as barriers. A higher answer here (indicating higher chance of accepting the vaccine if free or in tablet form) combined with scoring as a barrier in Questions 22-26 indicated strongly that cost or vaccine form were indeed barriers to vaccine acceptance. Question 12 was added to possibly identify other barriers to vaccination. This question was not scored. Perception of cost as a barrier was scored only on Questions 22-24 and had a possible score range of 3-15.

### **Perceived safety and effectiveness of Hepatitis B vaccine**

Respondents' beliefs about the safety of the vaccine were assessed by Questions 18-21. A 5 point scale was used to rate the chances of experiencing specified side effects of the vaccine, with 1 being very low and 5 being very high. The scoring was reversed for these questions, that is, if a respondent rated the chance of having the side effect as low, this indicated a high perception of safety of the vaccine. Question 28 asked participants specifically to rate the safety of the vaccine. This was scored

as on the questionnaire, with a 4 or 5 indicating that the vaccine was believed to be very safe.

Question 27 assessed belief about the effectiveness of the Hepatitis B vaccine. It was scored as on the questionnaire, so that an answer of 4 or 5 indicated that the respondent believed the vaccine to be very effective. The question of general vaccine safety was addressed by Question 29. This asked participants "Have you or any of your friends, co-workers, or family members ever had a bad reaction from an injected vaccine?" This was scored 0 if "yes" and 1 if "no". The "don't know" option was added for this study and was scored 0.5. It was presumed that belief in vaccine safety would be more likely in those who had not had personal experience or knowledge of adverse effects from an injected vaccine. Possible scores ranged from 6, indicating belief of very low safety and effectiveness, to 31, indicating belief of very high safety and effectiveness of the vaccine.

## **Appendix F**

### **Cover Letters sent with First and Second Questionnaires**

**Helen Le Sueur**

28 September 1994

Dear Colleague

I am undertaking a survey of practice nurses (nurses working in doctors' surgeries) in Western Australia to determine their knowledge of transmission and prevention of Hepatitis B infection and the number of nurses vaccinated against the disease. There is currently no information available about Hepatitis B awareness and vaccination among practice nurses in Australia. This study will collect and analyse data to establish the breadth of this awareness and to identify possible educational needs regarding Hepatitis B among this group of nurses in Western Australia. It is hoped that this study will stimulate further study on the role of practice nurses in Australia.

Enclosed is a questionnaire that will provide a way of gathering this much needed information. The questionnaire is quite lengthy, but this is necessary because so little data is currently available. I hope you will take the time to complete it and return it to me, within the next two weeks, in the enclosed Freepost self-addressed envelope.

The study is being undertaken in partial fulfilment of the requirements for the award of Bachelor of Nursing - Honours at Edith Cowan University, Western Australia. The study has been approved by the University Higher Degrees Committee and by the Nurses Board of Western Australia. Names and addresses of practice nurses registered with the Nurses Board of Western Australia have been randomly selected by the Board for the purpose of this study. To maintain your confidentiality, the survey is anonymous and this questionnaire has been posted to you by the Nurses Board of Western Australia. Your name and address have not been revealed to me by the Board and it will be impossible for you or your workplace to be identified by your answers to the questions contained in the questionnaire.

If you have any questions, or require more information about this study, please contact one of my research supervisors at Edith Cowan University, School of Nursing.

**Ms Lorrie Gray**

Edith Cowan University  
c/- School of Nursing  
Pearson Street  
Churchlands WA 6018

**Ms Esme Kershaw**

Edith Cowan University  
c/- School of Nursing  
Pearson Street  
Churchlands WA 6018

I appreciate your willingness to help me in my research effort.

Yours sincerely

**Helen Le Sueur RN, MRCNA.**

Helen Le Sueur  
[REDACTED]  
[REDACTED]  
[REDACTED]

12 October 1994

Dear Colleague

Enclosed is a second copy of the Hepatitis B Awareness Questionnaire. If you have already completed and returned the previous copy of the questionnaire please ignore this letter. To maintain your confidentiality, the survey is anonymous and it is impossible to identify those who have returned the questionnaire. As before, this has been posted to you by the Nurses Board of Western Australia. Your name and address have not been revealed to me by the Board.

In a survey such as this, a good response rate is necessary for the data collected to have real meaning. There is very little data available about practice nurses in Western Australia. I hope, therefore, you will take the time to complete the questionnaire and return it to me, within the next two weeks, in the enclosed Freepost envelope. It is anticipated that the results will be available at the end of this year. If you are interested in these please contact me at the above address or phone number. Please do not put your name or phone number on, or with, your questionnaire.

If you have any questions, or require more information about this study, please contact one of my research supervisors at Edith Cowan University, School of Nursing.

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I appreciate your willingness to help me in my research effort.

Yours sincerely

Helen Le Sueur RN, MRCNA.