Compliance with universal precautions
in Northern Kwa-Zulu Natal
operating theatres

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Dedication

This dissertation is dedicated to my late parents Amos and Ellen Biyela for the educational inspirations they instilled in me and my late child Sinothando, my only child, who left me early in life.
Summary

There is an increase in HIV/AIDS and other blood borne diseases. Health care workers are often exposed to blood and body fluids and thus prone to blood borne infections. Preventative measures can be taken to prevent health workers from contracting these diseases. However, health care workers need to stringently apply these measures. Universal precautions against blood borne infections include diligent hygiene practices, such as hand washing and drying, appropriate handling and disposal of sharp objects, prevention of needle stick or sharp injuries, appropriate handling of patient care equipment and soiled linen, environmental cleaning and spills management, appropriate handling of waste as well as protective clothing such as gloves, gowns, aprons, masks and protective eyewear.

This study is aimed at investigating compliance with universal precautions in operating theatres in Northern KwaZulu-Natal as well as perceptions of registered nurses working in these operating theatres regarding factors influencing compliance in order to contribute to measures to limit the risk of infection to patients and health care workers.

A sequential explanatory design, mixed-method (quantitative and qualitative) was used to explore the use of universal precautions in operating theatres in the Northern Kwa-Zulu Natal. In the first phase, the sample consisted of practices in operating theatres of six hospitals and one regional hospital in area 3 of Kwa-Zulu Natal. The adapted structured checklist based on an established document developed by the MASA Committee for Science and Education (1995) was pilot tested. The collected data was statistically analysed and interpreted with the help of a statistician using SPSS. The results of Phase 1 were used as a base for the Phase 2 questions. Three focus group interviews were conducted with professional nurses who were observed during Phase 1 at the selected hospitals.

Findings from quantitative data show that although health care workers take precautions to prevent infections, they do not attain full compliance to universal precautions. The qualitative data indicated that the reasons for non-compliance amongst others were the lack of knowledge of universal precautions, communication factors, resources, including
maintenance of equipment, lack of supplies and shortage of human resources and attitudes of health care workers.

Key Terms

Universal Precautions, Infection Prevention and Control, protective clothing, blood borne infections, health care workers, compliance, operating theatre.
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ABBREVIATIONS

AIDS    Acquired Immune Deficiency Syndrome
DOH    Department of Health
CDC    Center for Disease Control
HBV    Hepatitis B Virus
HCV    Hepatitis C Virus
HCW    Health Care Worker
HICPAC  Healthcare Infection Control Practices Advisory Committee
HIV    Human Immunodeficiency Virus
HPCSA  Health Professional Council of South Africa
HSRC  Human Science Research Council
IPC    Infection Prevention and Control
ICP    Infection Control Practitioner
KZN    Kwa-Zulu Natal Province
MASA  Medical Association of South Africa
MRC    Medical Research Council
NDOH  National Department of Health
NHMRC  National Health and Medical Research Council
OSHA  Occupational Safety and Health Administration
OT    Operating Theatre
SA    South Africa
SATS  South African Theatre Sisters
UP    Universal Precautions
UNAIDS United National Joint Program on HIV and AIDS
WHO   World Health Organisation
CHAPTER 1

OVERVIEW OF THE RESEARCH

1.1 Introduction

The increase in the prevalence of HIV/AIDS and other blood-borne diseases requires that health care workers comply with universal precautions (UP) to prevent infections in operating theatres. Protective measures that form part of the UP are used to prevent the spread of infections are encouraged and are supposed to be implemented in all situations where health workers and patients are exposed to blood and body fluids. In this study, the compliance of the healthcare workers in operating theatres in northern KwaZulu-Natal to these universal precautions was investigated.

1.2 Background

Universal precautions are deliberate actions taken in health care settings to prevent the transmission of certain pathogens from patient to patient, from patient to health care worker and from health care worker to patient. In particular, universal precautions aim to prevent blood borne pathogens such as the hepatitis B virus (HBV) and the Human Immunodeficiency Virus (HIV) from contaminating and penetrating the skin in particular non-intact skin, mucous membranes and conjunctivae (Committee for Science & Education, MASA, 1995: 381). These precautions are designed to prevent healthcare workers and patients from being exposed to blood and body fluids by applying basic principles of hand-washing, utilization of appropriate protective barriers such as gloves, masks, gowns and eyewear, and safe handling of all sharp disposables (needles, scalpels) and instruments in operating theatre (Motamed et al., 2006: 27).

Health care workers working in operating theatres are supposed to adhere to laid down policies and guidelines (Williams & Pieterse, 2005: 4). Accidental exposure to blood and body fluids in the operating theatre entail a risk of transmission of blood borne pathogens from patients to health care workers (Tarantola et al., 2006: 376) and health care workers
working in operating theatres are at a higher risk of being infected and thus need to comply to guidelines to protect themselves and their patients.

The National Health and Medical Research Council and the National Council on Acquired Immune Deficiency Syndrome recommended a 2-tiered approach to infection control (National Health and Medical Research Council, 1996:11). The World Health Organisation (WHO, 2004: 10) refers to the first tier as ‘standard precautions’ (also known as universal precautions), which are the first line of defence in infection control. It includes diligent hygiene practices (hand washing and drying), use of protective clothing, appropriate handling and disposal of sharps, prevention of needle stick or sharp injuries, appropriate handling of patient care equipment and soiled linen, environmental cleaning and spills management, appropriate handling of waste as well as protective clothing such as gloves, gowns, aprons, masks and protective eyewear. The second tier of precautions are strategies such as quarantine that is used in addition to standard precautions in situations in which standard precautions may be insufficient to prevent transmission of infection.

The Centre for Disease Control (CDC) in the United States formulated the basic elements of universal precautions in the 1980s (Jeong et al., 2008:739), and these have since been adapted for use in other countries. According to the South African version, the four basic elements of universal precautions that should be implemented in all health care settings include that all body fluids should be handled with the same precautions than blood; the avoidance of sharps (sharp objects); avoidance of skin or mucous membrane contamination; and cleaning/disinfection/sterilizing of equipment contaminated by blood or body fluids (Committee for Science & Education, MASA, 1995:382).

Research indicates that the use of universal precautions significantly decreases the number of incidents of occupation exposure to blood and body fluids (Matomed et al. 2006:654). Although universal precautions have been practiced for a long time, full compliance has been difficult to achieve. A number of studies on health care workers’ knowledge and compliance to UP have been done in countries like Australia (Osborne, 2003:415), Iran (Askarian et al., 2006:593; Motamed et al., 2006:653), China (Chan et al., 2007:1051) India (Kermode et al., 2005:27) and South Korea (Jeong et al., 2008:739). Most of the studies found fair to acceptable levels of knowledge, but suboptimal compliance (Askarian et al., 2006: 594; Chan, 2007:108; Jeong et al., 2008:741). The
reasons for non-compliance to UP include lack of knowledge, interference with working skills, risk perception, conflict of interest, not wanting to offend patients, lack of equipment and time, uncomfortable protective clothing, inconvenience, work stress, and a weak organizational commitment to safety climate (Gershon et al., 1995:225; Kermode et al., 2005:28).

Kermode et al., (2005:28) noted that the protection of health care workers is neglected in low and middle-income countries, even though they might be at higher risks than colleagues in higher-income countries, because of high disease prevalence among the patient population.

Against the background of the high prevalence of HIV/AIDS in South Africa and specifically in KwaZulu-Natal, health care workers and patients in operating theatres are at particularly high risk of exposure to occupational diseases and infections from blood and body fluids. Little is known about compliance to universal precautions in South Africa. Therefore, a study to investigate current practices of health care workers in operating theatres in KwaZulu-Natal regarding compliance to UP as well as an exploration of factors influencing compliance would be valuable. It could also eventually contribute to the development of strategies to enhance compliance in order to reduce the risk of infection of health care workers and patients by HIV/AIDS and other blood borne infections, which has been identified as a research need by Gammon and Gould (2005:542).

Against this backdrop, the following research questions arise and are linked to the research objectives:

1. What are the current practices of health care workers in operating theatres with regard to compliance with universal precautions in northern KwaZulu-Natal?

2. What are the perceptions of registered nurses working in operating theatres with regard to factors that influence compliance with universal precautions in northern KwaZulu-Natal?

1.3 Research aim

To investigate compliance with universal precautions in operating theatres in Northern KwaZulu-Natal as well as perceptions of registered nurses working in these operating
theatres regarding factors influencing compliance in order to contribute to measures to limit the risk of infection to patients and health care workers.

1.4 Research objectives

- To explore and describe the practices of health care workers regarding compliance with Universal Precautions in selected operating theatres in Northern KwaZulu-Natal
- To explore and describe perceptions of registered nurses working in operating theatres in Northern KwaZulu-Natal regarding factors influencing compliance with universal precautions.

1.5 Paradigmatic Perspectives

The paradigmatic perspective that informed the researchers’ research decisions, as explained below consists of meta-theoretical, theoretical and methodological assumptions (Botes, 1992: 40).

1.5.1 Meta-theoretical Assumptions

These assumptions are based on a Christian worldview, and include assumptions regarding human beings, the environment, health and illness. The explanation of these assumptions is guided by work of Van der Walt (1994).

1.5.1.1 Human being

The researcher’s view of human beings and therefore also of the health care workers involved in the study, is inextricably connected to her view of God. The researcher views God as the creator of the universe, and therefore agrees that He is the owner and ruler of creation. He cares for His creation and is concerned about everyone in particular.

God created human beings in His image. Human beings bear God’s image by the way we stand in a relationship with Him. Human beings are sinful, and they are only able to stand in a relationship with God by redemption in Christ. He has given humans a free will, and they may choose how they stand in a relationship with Him. He holds them accountable for this choice. The health care worker must have confidence to trust in God. Humans all
need God in their lives to help them to receive salvation. This relationship grows when they serve and glorify Him, obeying His commandments. When they come to the Lord, they are born spiritually and become children of God. They grow in different aspects of life. God created human beings as a soul, spirit and body.

Human beings are created as complex, unique, multidimensional beings, as man or woman. The dimensions include human being as body, human being as soul and human being as spirit. The dimensions are interwoven and a human being functions as a whole. God has given them the task of increasing, inhabiting, ruling, cultivating and caring for creation. Within this broad task, He has given each human being specific tasks, as well as specific gifts and talents, time, energy and means to fulfil these tasks. Humans fulfil these tasks within societal relationships and structures.

Health care workers as human beings can be categorized as novice, competent, proficient, or an expert. As experience is gained in an operating theatre, proficiency expands from a minimal competency to an advanced level of expertise and compliance to universal precautions is also improved. Health care workers display appropriate personal attributes and communication skills that inspire confidence and trust in patients and other team members in an operating theatre. Compliance to universal precautions and teamwork requires the commitment and effort of health care workers in an operating theatre to increase productivity, ensure quality performance and protection of patients.

Protection of patients against blood borne infections in operating theatres poses serious challenges to health care systems. There is a need to improve practices of universal precautions in operating theatres to reduce health care costs and prevent health care associated infections.

1.5.1.2 Environment

The environment also belongs to God, and is the sphere in which human beings can live in communion with and in service of God. Within this environment, human beings have the task to care for nature, as well as for each other. The hospital environment, especially the operating theatre is a high-risk environment, where high-risk procedures are performed, to identify and correct situations that threaten a patient’s safety and well-being. Adherence to UP guidelines and policies for good practice in the operating theatre remains the most effective way to prevent the spread of infection. The society or
environment of importance in this research was the operating theatre where surgical operations are conducted. All health care workers, including workers from supporting departments such as stores and maintenance departments, need to understand the importance of the infection prevention and control programme and universal precautions practices. Availability of working materials and equipment should be emphasized continuously in meetings. Changes in universal precautions should be communicated to ensure that knowledge is transferred effectively.

1.5.1.3 Nursing

Nursing means a caring profession practised by a person registered under section 31 of the Nursing Act (South Africa Nursing Act, 2005). The nursing profession encompasses a dedication, promise, or commitment, which are publicly made. There are excellent operating theatre nurses that have been awarded in the SATS congress for their commitment and contributions to the growth of this profession. Florence Nightingale, the first nursing theorist, is credited with developing the environmental theory of patient care on which all peri-operative patient care is based (Phillips, 2007: 16).

1.5.1.4 Health and Illness

Human beings experience health and illness in the totality of their being. In the operating theatre, surgical operations are conducted on healthy and sick patients, clean and dirty operations are performed as well as highly infectious operations with the aim of restoring health and saving life. The invasive nature of surgical operations has an increased exposure to blood and body fluids, therefore both the patients and the surgical team need to be protected from the risk of contracting these blood borne infections.

The researcher agrees with the World Health Organization's definition of health, namely that it is “a state of complete physical, mental, and social well-being not merely the absence disease or infirmity” (WHO, 1978). Illness is seen as impairment in health; and health and illness are dynamic states. In the operating theatre, inducement of infection can occur, as the barrier, which is the skin, is cut during an operation. Correct practices of UP in the operating theatre provides a foundation for the development of aseptic and sterile techniques on the part of health care workers. The HCWs need to develop and apply skills and knowledge in maintaining these aseptic and sterile techniques in the operating theatre. In cases of emergency, HCWs must be able to function under stressful
conditions without compromising the health of patients by not using reasonable standards for the prevention of infection. Positive attitudes motivate the health care workers to be productive and efficient in the operating theatre environment. UP are recommended by the CDC because blood borne infections exposure includes the risk of acquiring HIV/AIDS.

1.5.2 Theoretical Assumptions

The theoretical framework used as well as operational definitions are addressed in this section.

1.5.2.1 Theoretical framework

Universal precautions as described in the document of the Commission for Science and Education of the Medical Association of South Africa (1995: 381) that formed the base of the checklist and the chain of infection (WHO, 2004) is discussed in more detail in 2.3.2

1.5.2.2 Operational definitions

The following definitions outlined the key concepts applicable to this research.

- Infection Prevention and Control

Refers to measures, practices, protocols and procedures aimed at preventing and controlling infections and transmission of infections in healthcare settings (South Africa DOH, 2007:2)

- Pathogenic micro-organism

An organism of microscopic size, usually a bacteria or virus that cause disease or infection (Twitchell, 2003:41). In this study disease causing pathogens are blood borne pathogens causing blood borne diseases such as HIV/AIDS, Hepatitis B and C.

- Universal Precautions

Universal precautions are deliberate actions taken in health care settings to prevent the transmission of certain pathogens from patient to patient, from patient to health care worker and from health care worker to patient. In particular, universal precautions aim to
prevent blood borne pathogens such as the hepatitis B virus (HBV) and Human Immunodeficiency Virus (HIV) from contaminating and penetrating the skin (particularly non-intact skin), mucous membranes and conjunctivae (Committee for Science & Education, MASA, 1995: 381).

- **Practice**

A performance or a way of doing something, which is carried out usually or regularly, often as a habit, tradition or custom (The Free Dictionary Online: 2011).

- **Operating Theatre**

A health care setting where surgical procedures are performed, that is controlled geographically, environmentally, and bacteriologically, and affected by factors such as procedure complexity, the potential complications and the patient’s health status (Lewis et al, 2004:378).

- **Health care workers**

Health care workers in this study are those doctors and nurses who are directly involved with a patient in the provision of health services in operating theatre and include the following: the surgeon, the assistant surgeon, scrub nurse, anaesthetic doctor, anaesthetic nurse, and circulating nurse (South Africa National Health Act, 2003)

- **Compliance**

Compliance in this study refers to the extent to which health care workers follow the rules, regulations and recommendations of UP and Infection Prevention and Control measures (Ngesa, 2008: 7).

- **Professional Nurse**

A person registered as such in terms of Section 31 according to Nursing Act 33 of 2005. The operating theatre nurse acts within the scope of practice as a professional nurse during an operation and as a fully participating colleague.
1.5.3 Methodological Assumptions

The model of Botes (1992) was used to guide the research. This model was developed specifically for health research conducted by nurses. The model provides a holistic view of the research process, as well as a framework within which the researcher may follow different approaches (Botes, 1992:38).

The model presents the activities of nursing on three levels (Botes, 1992:40). The first level is the operating theatre practices. The researcher identifies research problems within the operating theatre practices, and research should be aimed at improving compliance to UP in the operating theatre practice.

The second level entails theory and research (Botes, 1992:40). At this level, the researcher conducts research according to the research process, guided by the research problem that was identified on the first level. The researcher assumes that doing research and using the evidence to improve practice will lead to better patient outcomes – reduced risk of infection. I believe a mixed method study will add value as the practices will not only be explored and described, but the perceptions of the factors influencing the compliance to it will also be investigated.

The third level is the paradigmatic perspective and serves as one of the determinants of research decisions (Botes, 1992:40). The paradigmatic perspective consists of meta-theoretical, theoretical and methodological assumptions, as discussed.

1.6 Research design and methods

In this section, the research design, study setting, sampling, data-collection and analysis of the two phases used to address the following research questions are discussed:

1. What are the current practices of health care workers in operating theatres with regard to compliance with universal precautions in northern KwaZulu-Natal?

2. What are the perceptions of registered nurses working in operating theatres with regard to factors that influence compliance with universal precautions in northern KwaZulu-Natal?
1.6.1 Research design

A sequential explanatory mixed-method design was used to reach the objectives of the study. The sequential explanatory design is characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data and the two methods are integrated during the interpretation phase of the study (Creswell, 2003: 215). In this specific mixed-method design the findings of Phase 1 obtained from observed practices in quantitative data was analyzed before the results of both phases were interpreted together (Creswell & Clark, 2007: 94). In phase 2, the researcher conducted focus group interviews to explore the factors influencing compliance with UP in operating theatres from registered nurses, by the use of structured open-ended questions. The research design is discussed in detail in chapter 3.

![Sequential explanatory design according to Creswell (2009:209)](image)

**Fig 1.1:** Sequential explanatory design according to Creswell (2009:209)

1.6.2 Research Setting

This study was conducted in operating theatres of KwaZulu-Natal (KZN), one of the nine provinces of South Africa, situated at the east coast of South Africa. Area 3 comprises of 3 districts, i.e. the UMkhanyakude, Zululand and UThungulu districts.
1.6.3 Rigour

Selection bias was restricted by selecting all the hospitals in Area 3 that have operating theatres. The checklist was based on a rigorously developed document. The checklist was also checked by an operating theatre specialist for content validity and for statistical usability. Finally, the checklist was pilot tested during similar elective abdominal operations in a comparable hospital.

More detail follow in Chapter 3.

1.6.4 Ethical considerations

Throughout the research, the researcher ensured that the research was conducted in an ethical manner by applying ethical principles. The following ethical issues were considered, namely, respect for persons, beneficence, and justice (Burns & Grove, 2005: 176).
Ethical approval for the study was obtained from the Research Ethics Committee of the University of Potchefstroom, Number: NWU-00034-10-A1 (Appendix A). Permission to conduct the study was obtained from the Provincial Department of Health (Appendix B), The District Managers’ offices of Area 3 (Appendix C), and Chief Executive Officers of all the participated hospitals (Appendix D) also had to give permission for the study. The ethical principles of research were taken into consideration. More detail follow in Chapter 3.

1.7 Chapters

The research report is presented in five chapters.

Chapter 1  Overview of the research

Chapter 2  Literature review on Universal Precautions

Chapter 3  Research Design and Methods

Chapter 4  Findings and Discussion

Chapter 5  Conclusions, Limitations and Recommendations

1.8 Summary

Chapter 1 gave an overview of this research, which included the problem statement, objectives, paradigmatic perspective, as well as the brief orientation in terms of the research methodology. The following chapter will discuss the literature review in detail.
CHAPTER 2

LITERATURE REVIEW ON UNIVERSAL PRECAUTIONS

2.1 Introduction

According to Burns and Grove (2005:93) a literature review is an organized written presentation of what is known regarding the topic of interest, and this is performed to gain insight into this topic and not to duplicate research. In this chapter, the following headings are discussed: types of infections, compliance to universal precautions (UP), operating theatre environment, process, procedures, policies and guidelines as well as factors influencing compliance.

2.2 Types of infections

There are many types of infections prevalent in operating theatres. In this study two types of infections are relevant, namely nosocomial infections and blood borne infections. There is an increased concern for the protection of health care workers against nosocomial infections and the protection of patients against blood borne infections in operating theatres is very important in the light of the high prevalence of HIV and hepatitis.

2.2.1 Nosocomial infections

A nosocomial infection is defined as an infection acquired in a health care facility by a health care user, health care worker or a visitor to a health care facility, who was in the facility for a reason other than that infection. This include infections acquired in the hospital but appearing after discharge, and include any infection in a surgical site up to six (6) weeks post operatively (South Africa DOH, 2007:8).

Such infection should have neither been present nor incubating at the time of admission or at the time of initial contact with the health care facility. The Healthcare Infection Control Practices Advisory Committee (HICPAC) of the CDC (2005) requires that all healthcare-acquired infections and infection rates are reported (Phillips, 2007:235).
Infections to be reported include indwelling catheter infections, surgical site infections, communicable diseases, ventilator-associated pneumonia, central line infections and septicaemia.

Nosocomial infection is one of the most important factors that adversely affect the performance and image of the hospital; it prolongs the stay of the patients, increases the bed occupancy rate and puts undue pressure on the already strained resources of the hospital, patients and community (Mustafa et al., 2004:38; Brink et al., 2006:643). According to the CDC, approximately 2 million patients yearly develop nosocomial infections in the United States, which are preventable if health care workers practice meticulous cleaning and disposal techniques (Hockenberry & Wilson, 2007:1106). Both patients and health care workers are at risk of contracting nosocomial infections while in the health care setting. Patients are at risk due to a weakened immune system, underlying disease, surgery or treatment such as steroids or chemotherapy, whereas, health care workers are at risk through procedures that expose them to body fluids and blood (Williams & Pieterse, 2005:40).

Surgical site infections is a type of nosocomial infection and is defined as infections occurring up to 30 days after surgery or up to one year after surgery in patients receiving implants, affecting either the incision or deep tissue at the operation site (Owen & Stoessel, 2008:3). The prevention of surgical infections requires the constant awareness of potential sources of infection by the health care workers.

Post-operative surgical wound infection can arise from a number of sources, generally classified into endogenous infections, which develop within the body, and exogenous infections, which are acquired from outside the body, for example from the environment or personnel (Fortunato, 2000: 575). It is always important to identify the source of the infection so that measures to prevent it happening in future can be initiated.

The other main type of infection relevant to this study is blood borne infections.

### 2.2.2 Blood borne infections

The transmission of blood-borne infections within the health care setting can occur in three directions. The first manner in which these infections can be transmitted is from patient to patient, for example, from contact with a health care worker’s hands that were
not disinfected after touching the patient, which can then infect another previously non-infected patient. The second manner in which a blood borne infection can occur is from health care worker to patient during exposure-prone invasive procedures such as surgery. Finally, infection can be transmitted from patient to health care worker e.g. through needle stick injuries in the absence of post exposure prophylaxis (The Viral Hepatitis Prevention Board, 2005; Duse, 2005: 38).

Health care workers in the operating theatre are constantly at risk of occupational exposure to blood and body fluids (Ngesa, 2008: 1; Perry et al., 2006: 42; and Friedman & Bernstein, 2003:1). Researchers agree that exposure to blood borne pathogens through a contaminated needle-stick or cut with a sharp object is the most common mode of occupational transmission in the operating theatre (Twitchell, 2003: 41; Tietjen et al., 2003: 37 and Lewis, et al., 2004: 378). In prospective studies focusing on health care workers, the average risk of infection from a contaminated needle or other sharp object from a known HIV positive source is approximately 0,3% (Twitchell, 2003: 41).

2.2.2.1 HIV Infections and AIDS

In South Africa, the blood borne infection that gets the most attention is the Human Immunodeficiency Virus (HIV) infection. HIV is one of many blood borne pathogens spread by unsterile procedures (Friedman & Bernstein, 2003:18). The Human Immunodeficiency Virus, the cause of AIDS, is transmitted through sexual contact, exposure to infected blood and blood components, needle stick injury and perinatally from an infected mother to neonate (South Africa HPCSA, 2007).

An estimated 33.2 million people globally were living with HIV and AIDS at the end of 2007 and approximately 63% of people living with HIV in the world were thought to be from the Sub-Saharan African Region (South Africa DOH, 2008:14). Southern Africa accounted for almost 32%, a third of all new HIV infection and AIDS-related deaths globally with the national adult HIV prevalence exceeding 15% in eight countries in 2005 (Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe) (UNAIDS and WHO, 2008: 5). In 2010, the national survey of HIV prevalence amongst 15-49 years old antenatal women attending the public health clinics was 30.2 %, while the Kwa-Zulu Natal Provincial HIV prevalence was 39.5% (See Figure 2.1) (South Africa DOH, 2011: 41). The annual surveys are done on attendees of public health
antenatal clinics over a one month period to monitor the HIV epidemic prevalence trends in 15-49 years old pregnant women.

Fig. 2.1 HIV prevalence among antenatal women by Province, South Africa,

In 2010 the UMgungundlovu and ILembe, districts was the district with the highest rate estimated at 42.3%. The distribution of HIV prevalence by district in KZN is shown in figure 2.2.

Fig. 2.2 HIV prevalence distribution by KZN District
The antenatal HIV statistics show the intensity of the AIDS pandemic in Kwa-Zulu Natal which creates additional challenges for operating theatre health care workers who have to perform large number of caesarean sections. It is likely that many of the patients that are operated in the operating theatre for caesarean sections are HIV positive. It is therefore important to prevent the spread of HIV to health care workers and to other patients.

2.2.2.2 *Hepatitis infections*

Another major blood borne infection is hepatitis, which is transmitted through exposure to infectious blood and body fluids. The Hepatitis C Virus is transmitted by percutaneous or permucosal exposure to infectious blood or blood-derived body fluids (The Viral Hepatitis Prevention Board, 2005: 3). The Hepatitis C co-infection is more common in HIV positive individuals and is associated with an increased mortality and renal morbidity (Parboosing, *et al.*, 2008: 1530-1536).

Elimination of needle recapping in and use of safer needle devices, sharp collection boxes, protective gear and universal precautions have begun to decrease needle stick injuries in the United States (Wilburn & Eijikmans, 2004: 5).

2.3 Infection Prevention and Control in the Operating Theatre.

The operating theatre is an area where the basic principles of sterility are maintained and adhered to in order to prevent infection. The patient has a right to a healthy and safe environment that will ensure his or her physical and mental well being throughout the peri-operative experience. The operating theatre environment may expose both patients and health care workers to infection, but there are measures in place in operating theatres to prevent these infections.

2.3.1 Design of Operating theatre

The operating theatre is an important setting where surgical interventions and procedures expose patients to nosocomial infections and surgical complications. The operating rooms are designed with complex ultra-clean ventilation systems intended to maintain clear air within the space (Healy *et al.*, 2006: 589-604) preventing and protecting both the health care workers and patients from airborne infections (Chow & Yang, 2005:138-147). It consists of the reception area for patients, anaesthetic rooms, change rooms, operating
and scrub rooms, recovery room, sluice rooms, corridors dividing unsterile, semi-restricted and restricted areas. Space must also be provided for the nursing station, storage of clean linen, equipment, drugs, and a utility room.

The operating theatre design and layout of the surgical suite is supposed to be clearly marked, ideally with coloured floor tape and door signs to establish and maintain an aseptic environment for health care workers and patients. Parker (1999: 341) explains that theatre design should incorporate a sequence of clean zones from the entrance to the operating theatre. These areas of restricted access should indicate to health care workers and visitors where appropriate theatre clothing should be worn.

The operating theatre environment needs a high-risk management programme for prevention of infection. The Centre for Disease Control introduced Universal Precautions to protect health care workers from exposure to blood borne infections.

### 2.3.2 Universal precautions

Different terms for example standard precautions are used but UP is the term most familiar to health care workers in developing countries, and is still used by WHO and International Council of Nurses (Kermode **et al.**, 2005). Thoughtful adherence to UP remains the primary means of preventing occupational exposures and thus reducing the occupational risk of acquiring blood borne infections (Beekmann & Henderson, 2005: 332). The South African National Department of Health is committed to providing a high quality of life for all people of South Africa by preventing health care associated infections (South Africa DOH, 2007: 2). In order to do risk assessment and implement infection prevention and control measures, health care workers need to understand the chain of infection (Salkin, 2004: 8), which include knowledge of the size of inoculum of the causative micro-organism, virulence of the pathogen, route of transmission and entry into the susceptible host as outlined in the following figure.
Fig 2.3: Chain of infection (WHO: 2004)

This chain of infection is used to understand the infection process and provides health care workers with knowledge of methods of self-protection. The practice of universal precautions guidelines and infection prevention and control principles provides the health care workers with techniques for destroying and for preventing contamination with blood borne infections. By compliance to basic elements of UP, the routes of transmission of blood borne infections are controlled. The portals of entry into the health care worker, the host, are the microorganisms that enter through direct contact. By identifying elements in the infection chain, health care workers can take steps to eliminate them through the practice of good personal hygiene, handling all body fluids as potentially infectious, use protective clothing, avoiding sharps injuries and proper waste disposal (Salkin, 2004:7).
2.4 Basic elements of Universal Precautions

The basic elements of universal precautions include care of body fluids. The latter included potentially infectious fluids including semen, vaginal secretions, cerebro-spinal fluid, synovial, pleural peritoneal, pericardial, and amniotic fluids or tissues taken for investigations that can be infectious with blood borne viruses (CDC, 2001). One of the principles of universal precautions is that all body fluids should be handled with the same precautions as blood. Universal precautions includes the use of protective clothing, avoidance of sharps, avoidance of skin or mucous membrane contamination, as well as cleaning, disinfection and sterilization of linen and equipment. In the following paragraphs the basic elements of UP are discussed.

2.4.1 Protective attire

All protective clothing related to blood and body fluids are discussed. Protective clothing protects health care workers working in the operating theatre from potential infection from pathogenic microorganisms and prevents clothing from becoming wet or soiled (Wharton & Wood, 2004: 5). A variety of protective attire such as facemasks, eyewear, gowns, overshoes, gloves, and head covers protect health care workers from the risk of exposure to blood and body fluids (Friedman & Bernstein, 2003: 7). Protective clothing especially the operating attire, is supposed to be laundered only in the hospital’s laundry facilities, and should not be taken home for laundering to prevent contamination (Phillips, 2007:265). The use of plastic aprons, impermeable boots, and face shields or eye protection by the surgical team where the risk of spillage exist, is also emphasized.

Protective attire should be made available to all health care workers and used correctly. In the study of Uys and Naidoo (2004: 4) it was evident that nurses scored poorly with regard to the correct use of protective clothing.

- **Facemasks**

The facemask provides a barrier for airborne organisms but also protects the wearer against blood and body fluid splashes (Mc Lure et al., 1998: 624-626). Initially the purpose of a surgical mask was to provide protection for the patient from the surgical team, but recently masks have been advocated as a protective barrier for the surgical team from the patient (Garner 1996; Lipp & Edwards, 2010: 2). Facemasks are thought to
reduce the number of postoperative wound infections (Lipp & Edwards, 2002). Facemasks should be changed between patients and whenever wet or soiled with blood and body fluids (Phillips, 2007: 265). The author further states that health care workers with an acute infection such as cold or sore throat should not be permitted within the operating room suite.

- **Eyewear**

Health care workers should wear protective eyewear during the operation and induction of anaesthesia to prevent a splash in the eye (Phillips, 2007: 422). Goggles or eye shields are inadequate to prevent eye exposures (Jagger et al., 1998:991). Larger protective eyewear such as visors can help to protect the mucous membranes of the eyes, mouth and nose when undertaking procedures that are likely to generate splashes of blood, body fluids, and secretions (WHO, 2003:10).

- **Gowns and Aprons**

A sterile surgical gown is worn over the fluid-proof aprons to permit the wearer to come within the sterile field. It differentiates the sterile from non-sterile team members (Fortunato; 2000:239). Line (2003: 72) explained that poly-cotton material allows bacteria through its weave and is easily dampened, disposable surgical gowns and a drape system was compared to a cotton system, and they found that the risk of developing wound infection was greater with the cotton materials than with the disposable materials.

- **Overshoes and Boots**

Disposable overshoes are used in the operating theatre by all health care workers. Boots can also be used by scrubbed nurses during the operation to protect against spillage of blood. The use of re-usable boots in the operating theatre is suspect, based on the evidence of blood and contamination, with 63% of all surgeons having blood-contaminated boots (Agarwal et al., 2002:179-183).

- **Head covers: hats and caps**

Parker (1999:341-343 ) recommended that scrubbed staff should wear disposable head covers because of their proximity to the operation field and theatre head covers are worn to prevent loose hair and skin from falling on wounds and cross-infections for blood borne
infections. Theatre head covers should be lint-free, durable, comfortable and disposable, and cover all hair easily (Lane & Cooper, 1999).

- **Gloves**

There is a high risk of the transfer of pathogens during invasive surgery; therefore both patients and health care workers need to be protected from this high risk by implementing protective barriers such as wearing surgical gloves (Tanner & Parkinson, 2006). The wearing of sterile surgical gloves is a necessary requirement to establish and maintain an aseptic environment for the patient, and also to decrease the health care workers’ risk of occupational exposure to and acquiring blood borne infections from patients (Osborne, 2003:416). Gloves should be worn to prevent skin contact with patient's blood and body fluids such as when intubating and suctioning the patient.

Double gloving provides increased protection to prevent accidental blood exposure in the operating theatre (Tanner & Parkinson, 2002:4). Double gloving reduces the risk of exposure to patient blood on surgical team hands by as much as 87% when the outer glove is punctured (Berguer & Heller, 2004:462). If a glove is punctured intra-operatively, both the glove and instrument should be discarded and fresh ones used (South African Theatre Sister, 2009:18). All health care workers in the operating theatre are expected to change gloves after contact with each patient and to wash hands immediately after removing the gloves.

It is of utmost importance for health care workers in the operating theatre to utilize gloves correctly according to South Africa DOH (2007). According to the review conducted by Tanner and Parkinson (2009), double gloving provide more protection and reduce perforation to the inner glove during orthopaedic and dental surgery, hence health care workers are more prone to sharp injuries.

### 2.4.2 Avoidance of sharps (sharp objects)

An estimated 600 000- 800 000 needle stick and sharps injuries occur among health care workers each year (Twitchell, 2003:42). The literature shows that sources of operating theatre exposure include scalpels, hypodermic needles, stylets, scissors, wire sutures, orthopaedic equipment (drill bits, screws, pins, saws), needle point cautery tips, hooks, towel clips and forceps (Davis, 1991; Tietjien et al., 2003). Needles must be handled
carefully without recapping after use to avoid accidental needle sticks and discarded in the sharps container.

Anaesthetists are at risk of percutaneous injuries because of their frequent exposure to needles and other sharp instruments (Merah et al., 2005:132) e.g. spinal analgesia is commonly performed thus exposing the anaesthetist to cerebro-spinal fluid, one of the high-risk fluids. The study by Friedman and Bernstein (2003: 47) examined occupational exposure to HIV Infection for a wide range of surgical procedures indicated the importance of using blunt suture needles to prevent a majority of skin penetration injuries. High-risk procedures where the sharp object is in a poorly visualised or highly confined anatomic cavity may require extra caution such as the use of special gloves (South Africa HPCSA, 2007: 4).

2.4.3 Avoidance of skin or mucous membrane contamination

Blood or body fluids on the hands, spillage of blood or body fluid on the health care workers body or spray-aerosol of blood or body fluid to eyes and face are handled according to UP guidelines (WHO, 2003). UP are also designed to prevent contamination of the skin, especially non-intact skin and mucous membranes (South Africa HPCSA, 2007:9). Aspects discussed under protective attire e.g. masks, eyewear and gloves could also have been discussed under avoidance of skin or mucous membrane contamination. All anaesthesia equipment that has come in contact with mucous membranes, blood and body fluids should be cleaned, disinfected and sterilised after use.

2.4.4 Cleaning/ Disinfection/ Sterilization

The role of decontamination as part of essential control measures is documented in the study of Waller (2002:15-17). Line’s (2003:70-75) study findings suggested that a cleaning agent of proven activity should be used, cloths should be disposable and mop heads be sterilized daily. Housekeeping procedures include cleaning and disinfecting of the preoperative environment, handling soiled laundry, and disposing of solid waste. Physical cleaning is the most important step in a disinfection and sterilisation process.

Disinfection of reusable instruments and materials refers to the use of a physical process or chemical agent to destroy vegetative pathogens but not bacterial spores, thereby reducing microbial load (South Africa HPCSA, 2007:8). Household grade disinfectants
suitable for environmental purposes should be used and instrument grade disinfectants are classified as high, intermediate or low level (WHO, 2003:25).

Sterilization is a process that destroys all microorganisms including spores and viruses. The most commonly used method of sterilization is moist heat such as steam under pressure (Berman et al., 2008:688). All reusable instruments or equipment should be cleaned properly using a detergent and water before the disinfection or sterilization processes. All surfaces of the instruments or equipment should be cleaned, taking care to reach all channels and bores of the instrument (WHO, 2003:23). Surgical instruments are usually used on multiple patients, and this makes it critical that healthcare workers are trained in proper sterilization techniques and have necessary equipment to verify their sterility in prevention of HIV transmission (Friedman & Bernstein, 2003:6). Surgical site infections can occur through the use of contaminated equipment. To maintain sterility, items are handled with care and stored under controlled optimal conditions, the packaging should remain intact and stocks need to be rotated (SATS, 2009:40). Disposable instruments are used once, and re-usable items must be sterilised (South Africa HPCSA, 2007:8), however, the performance of re-usable surgical textile products changes with repeated processing and use (SATS, 2010:56).

Single-use items such as drapes, surgical gowns, and medical supplies provide optimum barrier protection, sterility, consistent quality, and dependability when they are used. The occupational risks for blood borne infections and needle pricks is likely to be lower for single-use surgical gowns and drapes due to minimal handling after use (SATS, 2010:56).

2.4.5 Hand washing and Scrubbing

Hand washing is the single most effective way to prevent cross-infection. Hands are washed with soap and water following the procedure by rubbing all hand surfaces for about ten to fifteen seconds and dry hands well using hand paper towel. Antibacterial soap is used to decontaminate hands during hand and arm scrub before the surgical operation in the operating theatre. Surgical hand washing involves the use of a sterile brush and a reliable antiseptic for a two to five minute scrub (Phillips, 2007: 273).
2.4.6 Handling of linen

Appropriate handling and flow of linen is ensured by separating clean and dirty areas of the operating theatre. Linen used in the operating theatre is known to harbour a number of microorganisms and is a potential source of cross contamination. According to the WHO guidelines, linen contaminated by blood, body fluids, secretions and excretions should be handled with minimum agitation to avoid aerosolisation of pathogenic micro-organisms and put in impervious bags for transportation from the operating room to avoid any spills (WHO, 2003:20). It is therefore important that South Africa (DOH and KZN DOH, 2007), WHO guidelines (2003), CDC guidelines as well as OSHA guidelines (2005) should be followed regarding the handling and processing of contaminated and soiled linen in the operating theatre.

2.4.7 Waste Management

Operating theatre waste requires management at every step from generation, segregation, collection, transportation, storage, treatment to final disposal. Segregation of wastes into prescribed categories should be done at the source point of generation (South Africa HPCSA, 2007:8).

Colour coded bags according to National Infection Prevention and Control guidelines (2007) need to be placed in appropriate containers with the appropriate labels; the following items are treated as bio-hazardous waste suction liners, operating theatre waste, items containing visible blood and body fluids and all specimens including non-fixed tissues. All bio-hazardous containers should have a red bag liner, attached lid, be appropriately labelled and be foot-operated. Beekmann and Henderson (2005:332) emphasized thoughtful adherence to UP as the primary means of preventing occupational exposures and reducing occupational risks of acquiring infection with blood borne pathogens.

2.5 Policies, Procedures and Guidelines for Infection Control

Infection Prevention and Control refers to measures, practices, protocols and procedures aimed at preventing and controlling infections and transmission of infections in healthcare settings (South Africa DOH, 2007:2). The Centre for Disease Control and Prevention (CDC), World Health Organization (WHO), National Health and Medical Research Council
NHMRC, and Occupational Safety and Health Administration (OSHA) are continually developing and updating the basic elements of UP and Infection Prevention and Control policies and guidelines to prevent exposure of health care workers to blood borne infections.

In South Africa, the Department of Health, both Nationally and Provincially, Medical Association of South Africa (MASA), Health Professionals Council of South Africa (HPCSA), and South Africa Theatre Sister (SATS) organisation have developed legislation, policies, and guidelines, norms and standards, and set strategic priorities to ensure protection of health care workers against occupational exposures to blood and blood fluids and quality service delivery in operating theatres. The other problem in the health care facilities is the variation in the availability of measures and resources for implementing UP concepts and guidelines that ensure safety of health care setting (Isah et al., 2009:170). All patients presenting to health care facilities, especially booked for surgical operations, irrespective of their diagnosis must be treated using UP precautions to minimise the risk of micro-organisms transmission from patient to health care worker and vice versa (Duse, 2005: 38).

The Infection Prevention and Control (IPC) consist of a variety of dedicated infection control practitioners. Firstly, there is an Infection Control Practitioner (ICP) at a hospital level who monitors and sustains an efficient infection control programme within each hospital and its surrounding clinics. This ICP conducts infection prevention and control audits and send a report to a District Infection Prevention Control team. This team undertakes quarterly peer reviews of infection controls in the hospitals and clinics in the relevant district (South Africa KZN DOH, 2007). In addition, the results are then fed into a Provincial Infection Prevention Control forum. However, it has been noted that the team does not actually visit operating theatres to monitor the standards of infection control and compliance to preventative measures.

The Infection Prevention and Control (IPC) strategy of KwaZulu-Natal is aimed at facilitating the implementation of both National and KwaZulu-Natal IPC Policies and Guidelines, and by so doing minimise incidences of nosocomial infections. Conscientious application of UP for infection control in the operating theatre should provide protection against occupational exposure to HIV, hepatitis, tuberculosis, and other communicable or
resistant infections (Fortunato, 2000:53). Inadequate infection control facilities, materials and equipment encourage transmission of infection (Isah et al., 2009:165).

Infection Control activities on their own are primarily centred on the goal of decreasing or preventing the transmission of nosocomial pathogens to patients and health care workers (Duse, 2005: 37). The efficacy of Infection Control and Prevention programmes in decreasing health care associated infections is variable across South African health care facilities (Brink et al., 2006: 644). Policies will not be effective if they are not optimally implemented and health care workers are not compliant.

2.6 Compliance to Universal Precautions (UP)

Compliance refers to the extent to which health care workers follow the rules, regulations and recommendations of UP and Infection Control (Ngesa, 2008: 7). In the study done in London on UP, the compliance rate was less than 38% (Gammon & Gould, 2005:534).

The widespread inability of health care workers in developing countries to implement UP necessary for protecting themselves, such as the wearing of visors in the operating theatre, frequently has devastating consequences (Friedman & Bernstein, 2003:1; OSHA, 2005:4; Magnavita, 2004:195; Berguer & Heller, 2004:462 and Lewis et al., 2004:378). UP have been previously recommended and implemented, but compliance is still poor (CDC 1988; OSHA, 2001; WHO, 2003; South Africa DOH & KZN DOH, 2007).

2.6.1 Human factors influencing compliance to UP

Various human factors have been identified through research.

2.6.1.1 Shortage of Health care workers

Shortages of health care workers in operating theatres have become a limiting factor in the provision of quality care. The severe shortage of doctors in public hospitals has led to a poor orientation of young doctors leaving them alone to do operations in operating theatre with resultant complications and frustrations. Previous studies have reported an increasing number of doctors who are leaving their hospitals due to different reasons, for example poor working conditions (Edwards et al., 2002:835 and Tokuda et al., 2009:166),
thus putting more pressure on operating health care workers as they conduct operations with an incomplete surgical team.

2.6.1.2 Poor communication

Communication is the primary foundation of a successful team on prevention of infection in the operating theatre. Vertical and horizontal communication is vital to provide new information timeously on infection prevention and control (IPC) to achieve good operation outcomes. Standardization of peri-operative patient care by the use of orientation manuals, instrument books, surgeons’ preference cards, operating theatre policies and procedure manuals assist health care workers to foster coordination of activities and introduce new techniques on infection prevention and control (Phillips, 2007:15). Poor communication among health care workers in the operating theatre affects teamwork, performance and compliance to universal precautions.

2.6.1.3 Lack of knowledge

Inadequate knowledge of universal precautions by operating theatre nurses has been shown in a study conducted by Chan et al. (2007:1053). Adequate training, guidance and experience of health care workers in the peri-operative clinical setting are required to build knowledge about infection prevention and control as well as universal precautions. Clinical teaching and evaluation sessions must ensure that principles of IPC are observed and evaluation instruments also include criteria for the IPC (South Africa DOH, 2007:25).

2.6.1.4 Attitudes of health care workers

There are many factors that influence attitudes of HCWs towards compliance with universal precautions within the operating theatre, such as a lack of resources, poor communication, a lack of knowledge and poor working conditions (Osborne, 2003: 420). Attitudes influence behaviour of health care workers and that may lead to positive or negative attitudes. Kermode et al. (2005: 32) suggested that the promotion of the safety climate is consistently associated with compliance to UP.
2.6.1.5 Lack of resources

Many factors influence the quality of care in the operating theatre and human resource shortages, for instance material constraints and capacity constraints all contribute to poor nursing care (Pham, 2007: 7; Askarian et al., 2006: 595). A lack of protective clothing and equipment in the operating theatre influence the quality of patient care. The spatial distribution of health care workers in rural areas and the lack of adequate facilities in district hospitals’ operating theatres leave the nurses drained, exhausted, and struggling to cope with the overwhelming workload (Daft, 2000: 615).

2.7 Conclusions

The available literature affirms that various measures are being undertaken by the health department to protect health care workers from occupational exposures. Findings from studies relate to the development of policies, procedures, guidelines, norms and standards in order to improve quality of health care and service delivery. In this literature review the universal precautions and the related processes were discussed in detail.

The following chapter is a detailed discussion of the research methodology that was followed in this research in order to explore and describe the practices regarding compliance with universal precautions.
CHAPTER 3
RESEARCH DESIGN AND METHODS

3.1 Introduction

The literature review in chapter 2 provided a detailed description of the topic of interest, namely compliance with universal precautions. This chapter focused on explaining the detail of the research design and method, validity and reliability as well as the ethical aspects relevant to this study.

3.2 Research design

A sequential explanatory mixed-method design was used to reach the objectives of the study. This research design is a two phase mixed-method design (refer to figure 3.1) that starts with the collection and analysis of quantitative data. In phase 1, the quantitative phase, the universal precaution practices of the health care workers in the operating theatre were observed. The questions for Phase 2, the qualitative phase, were based on findings of Phase 1. The data from both quantitative and qualitative phases was analyzed separately before the results of both phases were interpreted together (Creswell & Clark, 2007:72).

Figure 3.1 Sequential explanatory design according to Creswell (2009:209)

The application in this specific study is discussed in more detail in the following paragraphs.
3.3 Research Setting

KwaZulu-Natal (KZN), one of the nine provinces of South Africa, is situated at the east-coast of South Africa and is the most populous province with 21% of the country's population residing here. The KZN Province consists of 3 areas, which are divided into Area 1, Area 2 and Area 3. Area 3 is a rural area in Northern KwaZulu-Natal and comprises of 3 districts, i.e. the UMkhanakude, Zululand and UThungulu districts. The districts of UMkhanyakude, and Zululand are two of the districts with the highest levels of poverty and are also poorly resourced in terms of health provision compared to other districts (South Africa KZN DOH, 2005-2010:31). KZN is also the epicentre of the HIV/AIDS pandemic, in 2010 UMkhanyakude was one of the five districts in South Africa with an HIV prevalence of more than 40% with a prevalence of 41.9%.

Figure 3.2: Districts of KwaZulu-Natal
Table 3.1 Population and hospitals in Area 3 (South Africa KZN DOH, 2005-2010:31).

<table>
<thead>
<tr>
<th></th>
<th>UMkhanyakude</th>
<th>Zululand</th>
<th>UThungulu</th>
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<tbody>
<tr>
<td>Population</td>
<td>593 718</td>
<td>833 037</td>
<td>917 451</td>
</tr>
<tr>
<td>District hospitals</td>
<td>5</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Regional Hospitals</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
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Each district hospital has 2 to 4 operating rooms while the regional hospitals have 3 and 6 operating rooms.

3.4 Research methods

3.4.1 PHASE 1: Quantitative phase
(Structured observation of universal precautions behaviour with checklist)

The quantitative data and the subsequent analysis provide a general understanding of the extent of theatre health care workers’ compliance with universal precautions. The researcher and the research assistant used a structured checklist to observe practices of health care workers and employed non-participatory skills in observing behaviours of health care workers as well as recording. Observations of compliance were conducted before, during and after major abdominal surgery. The quantitative data collected was analysed, and the researcher identified specific practices that were not well adhered to, to be further explored during the focus group interviews in the second phase.

In this section, the first phase sampling, data collection and analysis is discussed in detail.
3.4.1.1 Population and Sampling

The study population was the practices related to universal precautions during elective abdominal operations. Information about the hospitals, health care workers and operations performed was necessary to ensure that there were opportunities to observe such practices. Statistics of the hospitals with operating theatres in Area 3 of Kwa-Zulu Natal are included in Appendix E.

A stepwise sampling process was followed. The number of hospitals as well as number of operations to be observed was determined in consultation with the Statistical Consultation Services of the Potchefstroom campus of the North-West University. The number of health workers involved in each operation depended on the type of operation and varied between four and six persons.

The practices relating to universal precautions of the different categories of health care workers who are involved in the elective abdominal operations were observed. Health care workers in the checklist were the surgeon, surgeon assistant, scrub nurse, circulating nurse, anaesthetic doctor and anaesthetic nurse (Appendix F). All the health care workers working in operating theatres before, during and after major abdominal elective surgery, for example caesarean sections were observed. These types of operations are common and carry a high risk of infection.

There are five district hospitals in UMkhanyakude district with operating hospitals and no regional hospital, in Zululand district there are five district hospitals with operating theatres and there is no regional hospital. In UThungulu district there are six district hospitals and two regional hospitals with operating theatres. Each district hospital has two to four operating rooms and the regional hospitals have three to six operating rooms.

The sampling frame is defined as a comprehensive list of the sampling elements in the target population (Brink et al., 2006:124). Statistics of the study population was collected by the researcher over a period of six months from all hospitals in Area 3 to determine the number of hospitals which had operating theatres performing these abdominal operations, the number of nursing staff allocated to the operating theatre on day and night duty, the number of abdominal operations performed per month and per week as well as the elective days for obstetric and gynaecological slates. The researcher used the readily
available statistics of six months by phoning all the hospitals and collecting information from the operation registers for the period of January to June 2009.

According to Polit et al. (2001:234) sampling is the process of selecting a portion of the population to represent the entire population. Two (2) district hospitals were randomly selected from each district using the Excel programme, excluding the one hospital where the researcher is working, as well as one of the two regional hospitals in the area. The researcher was assisted by the Statistician, six district hospitals and one regional hospital were selected giving a total of seven (7) hospitals. In these hospitals, a specific day when at least 4-5 operations are scheduled was selected for each hospital. During the elective abdominal operations, for example, caesarean sections, laparotomies, and hysterectomies, practices related to universal precautions according to the checklist as practiced by the health care workers in operating theatres were observed.

The sample size of the number of operations that needed to be observed was determined in consultation with Statistical Consultation Services of the Potchefstroom campus of the North-West University, recommended two to four operations to be observed in each hospital. The sampling criteria for inclusion in the study sample were; a hospital in Area 3, with an operating theatre performing these abdominal operations, and health care workers involved during abdominal operations.

3.4.1.2 Data-collection

• Data-collection instrument

Data was collected by means of a newly developed observation checklist (Appendix G) based on the South African document on universal precautions formulated by the Commission for Science and Education of the Medical Association of South Africa (1995: 381). The Medical Association of the South African Committee and Education (MASA), and twenty national health care organisations and three provincial health authorities, ensured internal consistency and reliability by circulating a draft document to 87 National Health care organizations and to the Provincial Health authorities for comment and endorsement. The draft guideline was subjected to extensive external review by specialist, generalist and health professional groups, which included HIV activist groups and trade unions (Committee for Science and Education of the MASA, 1995: 381).
The checklist included items on compliance with the four basic elements of Universal Precautions (UP) namely,

1. handling of blood and body fluids,
2. handling of sharp objects,
3. avoidance of skin or mucous membrane contamination and
4. cleaning / disinfection / sterilizing of equipment contaminated by blood or body fluids (Appendix F). Selection and training of research assistant

The pilot study was conducted where the researcher is working and five elective abdominal operations were observed in order to test the checklist. A pilot study using the newly developed checklist to observe practices relating to universal precautions during elective abdominal surgery was conducted in November 2010, to test the checklist and data-collection procedure. The checklist was subsequently revised to include the anaesthetist and the anaesthetic nurse who were involved during the operations.

*Data-collection procedure*

The researcher and research assistant observed the practices of health care workers in the operating theatre. The research assistant was trained by the researcher using the SOP (Appendix G) and is a qualified professional nurse with operating theatre experience.

The researcher prepared for each hospital visit by phoning the hospitals selected and communicating with nursing managers, planning for data collection in accordance with their operation days and busy days in order to observe as many operations as possible. The researcher organised transport and accommodation, prepared files with adequate supplies of data collection (data collecting tools) and collected all permission letters (DOH permission letter, DM permission letter, Institutional permission letter and NWU ethics approval letter).

On arrival in the hospitals, the researcher and the assistant researcher reported to the Chief Executive Officer’s office and to the nursing manager and also produced all relevant documentation. The researcher introduced themselves to the assistant nursing manager (ANM) and to the operating theatre operational manager (OM) and explained the purpose of the visit. The researcher also briefed the ANM and OM of the operating theatres about
the 2 key activities of data collection (observations and focus group discussion). Verbal informed consent was obtained from all patients who were done abdominal operations. No patient information was recorded on the checklists. The researcher and research assistant changed into operating theatre attire and observed HCWs for complete wearing of theatre attire which are cross-over dresses or pants and tops, head cover, shoe cover or shoes. Quick orientation to operating theatre environment especially operating rooms was done by the OM. The researcher and research assistant identified the first checklist as operation 1 and the first hospital as number A.

The participants were informed about observations of operations but not the details of the research otherwise they would modify their behaviour. Verbal informed consent was obtained from HCWs (see 3.6.1 for details). The participants were also informed that their names won’t be written on the checklists.

Data was eventually collected over a period of ten months by means of direct observations of health care workers’ activities and UP behaviours. Direct observations are considered as a gold standard for monitoring compliance (Boyce, 2008). The researcher and research assistant were non-participant observers and recorded all UP practices occurring before, during and after major abdominal elective surgery. The researcher took field notes and also recorded all activities and unanticipated events that were not included in the checklist. The researcher used the information as base for discussion in the focus groups of phase 2. Sixteen abdominal operations were observed in all and giving the total of thirty two checklists filled.

3.4.1.3. Data-Analysis

Data from the completed checklists was entered onto a spreadsheet, and analyzed. The data was used as base for descriptive statistics. The descriptive statistics analysis enabled comparisons of frequency of correct, partially correct and incorrect practices by different categories of the health care workers team working in the operating theatres. The descriptive statistical statistics enabled comparisons of the frequency of “done”, “partially done”, “not done” and “not applicable” practices by different HCWs in the operating theatre. The frequency and complete wearing of protective clothing, with which actions were practiced, were analyzed as well as the factors that were associated with compliance or non-compliance. The data analysis was performed using SPSS with the
help of the statistician. The researcher summarised the findings as base for discussion in the focus groups of phase 2.

3.4.1.4 Validity and Reliability

An operating theatre specialist reviewed the checklist for face validity, comments and suggestions that were taken into account. The checklist was pilot tested (Appendix F) during 5 elective abdominal operations in a hospital where the researcher is working and which was not part of the sample, but similar in nature to those in the sample. Based on the findings from the pilot test, the checklist was revised. Reliability refers to the degree to which the instrument can be depended upon to yield consistent results if used repeatedly over time on repeated observations or if used by two researchers (Brink, 2006: 163). The researcher and research assistant observed one operation using two checklists, each one filling one checklist and also discussed the findings at the end of the operation to get the same understanding. Internal consistency of the checklist was ensured when formulating it by the commission SAMA (1995) using structured observations. Stability of the checklist was also ensured by using two checklists on observations of every operation to ensure consistency.

The degree of accuracy of the observations and nature of data to be collected (Rossouw, 2005: 166) was ensured by training the research assistant on the checklist by the researcher.

3.4.1.5 Summary of Phase 1: research methodology

The research methodology is summarised in table 3.2.
Table 3.2: Summary of Phase 1 Research Methodology

<table>
<thead>
<tr>
<th>OBJECTIVE ONE</th>
<th>POPULATION</th>
<th>SAMPLE</th>
<th>DATA COLLECTION</th>
<th>DATA-ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHASE 1</td>
<td>Consist of the district and regional hospitals in Area 3. Two district hospitals were selected per district and one regional hospital was randomly selected, and determined in consultation with the Statistical Consultation Service of NWU, Potchefstroom Campus. Four to six participants were observed before, during and after the operation. Two to four abdominal operations were observed in each hospital.</td>
<td>UP related practices of the surgeon, assistant surgeon, scrub nurse, anaesthetic doctor and anaesthetic nurse during major abdominal surgery in the selected operating theatres. The observation tool to assess the practices of UP was validated by the Commission for Science and Education of the MASA (1995: 381). A pilot study was undertaken to test the data-collection tool and to identify possible logistical problems. Data was collected by means of a structured observation checklist. The researcher and research assistant observed the practices during elective abdominal operations. The checklist included items on compliance with the four basic elements of Universal Precautions.</td>
<td>Excel programme and SPSS was used for the analysis of quantitative data. Descriptive statistics analysis of frequencies of correctly done practices, partially done and not done.</td>
<td></td>
</tr>
</tbody>
</table>
3.5 Phase 2 Qualitative Phase

(Focus groups regarding factors influencing compliance to universal precautions)

The data collected during Phase 1 contributed to the attainment of the Phase 2 objective. This second phase was conducted to explore perceptions of registered nurses regarding factors influencing compliance to UP. Focus group interviews were conducted in this stage. Focus group interviews are designed to obtain the participants’ perceptions in a focused area in a setting that is facilitative and non-threatening (Burns & Grove, 2005:542).

In this section research methods are described with reference to study setting, study sample and sampling methods, data-collection and data-analysis methods. There is also an explanation of processes to ensure trustworthiness of the study and results of phase 2 are provided.

3.5.1 Study population

The researcher conducted focus group interviews in operating theatres with registered nurses who were observed during phase one. An interview schedule (refer to Appendix L) was used to explore questions, although the purpose of the questions was to guide the interview in order to explore the factors influencing compliance with universal precautions in operating theatres. Polit and Hungler (1999:331) suggest that the researcher starts with some general questions or topics and allows participants to tell their stories in a narrative fashion. It was necessary for the researcher to guide participants by asking specific questions.

On arrival at the hospital, it was explained to the operational manager that all registered nurses working in an operating theatre who were willing to participate, would be interviewed regarding factors influencing compliance with universal precautions. The researcher prepared the setting for the focus group interviews inside operating theatre after completion of operating lists in order to obtain more participants.
3.5.2 Sampling

During phase 2, focus group interviews were conducted with registered nurses, as they are overall supervisors of theatre rooms during operations, therefore the infection prevention and control programme forms part of their responsibilities.

Purposive sampling, as described by Babbie and Mouton (2004:166), was employed to select potential participants for the focus groups. Selection for inclusion in the focus groups included the following:

- Participation in the focus groups should be voluntary;
- All participants should be well informed about the nature and content of the research and should sign an informed consent willingly;
- Only professional nurses working in operating theatre environment in the selected hospitals and who were on duty on the day of data-collection were included in focus group interviews.
- All other categories of nurses and doctors were excluded from the focus group interviews.

The sample size was determined by data-saturation as described by Burns and Grove (2005). Data-saturation was reached after three focus group interviews were held.

3.5.3 Data-collection

The researcher collected data by means of focus group interviews. Informed consent was obtained from all the participants for data-collection and audio recordings (refer to Appendix I), after which rapport was established through a round of introductory remarks and by means of an ice breaker. The researcher started with explaining the aims of the interview. The qualitative data and the subsequent analysis explained the results of Phase 1 by exploring the participants’ views on the factors influencing compliance with Universal Precautions in more depth. Biographic information of the participants was obtained with regards to age, sex, nursing qualifications, and working experience in an operating theatre by filling in the biographic data tool (Appendix N).
Data was collected through six main questions:

1. Are body fluids handled with the same precautions as blood? The majority of HCWs we observed did comply in handling body fluids correctly through the use of gloves, eye protection. What do you think contributes to the 20% of non-compliance?

2. Avoidance of sharps injuries. What do you think are some reasons for not handling sharps correctly?

3. In avoiding of skin or mucous membrane contamination, one hospital did particularly poor in hand washing - what could be reasons for this behaviour?

4. Handling of blood and body fluids spillage on skin. Compliance with wearing of plastic aprons, plastic boots was not good in most of the hospitals. What could be the reasons for non-compliance?

5. Spray / Aerosol precautions and decontamination of blood and other body fluids, one hospital had the highest compliance with face/ eye protection while other hospitals had partial compliance and non-compliance. What can be the reasons for partial and non-compliance?

6. Regarding the use of cleaning/ disinfecting/ sterilizing, it seems that the majority of participants in the different hospitals complied except for one where participants were observed to have no knowledge of the strength of disinfection; can you comment on possible reasons?

The focus group interviews were conducted with participants who were observed during Phase 1 at the selected hospitals, including district and regional hospitals. The researcher and experienced research assistant conducted three focus groups discussions, while the researcher also acted as field worker to record observational notes, personal notes and methodological data. The data-collection was continued until data-saturation was reached. Three focus group interviews with four participants each were conducted. The initial focus group interview served as a trial run, and because major adjustments were not necessary, it was also included in the data-analysis. A participant information letter (Appendix H) was read to all participants explaining the aims and benefits of the research study and the obtained informed consents. The focus group was conducted on a quiet day or afternoon after completion of operating lists in a private, comfortable venue. An audio recorder was used during the interviews, and six main questions were asked.
Communication techniques such as clarifying, summarising and reflection were applied by the researcher throughout the interviews. Small incentives (refreshments) were provided by the researcher at the end of the interview.

### 3.5.4 Data-analysis

The combination of the analysis procedure of Tesch 1990 in Creswell (1994:155) was used to analyze the tape recorded data after a verbatim transcription was made. A thematic analysis with codes and sub-codes of the interview transcriptions and field notes was done. A co-coder was supplied with instructions for data-analysis and consensus discussions were held until an agreement was reached. The data was then reconstructed by describing the development of themes; entering into dialog with existing research and integration of concepts (Heath, 1997:3).

### 3.5.5 Trustworthiness

The Lincoln and Guba’s Model (1985:299) was applied to ensure trustworthiness of this phase 2. Trustworthiness exists if the findings of a qualitative study represent reality. The four criteria for trustworthiness are credibility, transferability, dependability and confirmability. (Streubert & Carpenter, 1995:29) Table 3.3 represents the application of trustworthiness to the study.

Table 3.3: Application of Trustworthiness

<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>MEASURE/ CRITERION</th>
<th>APPLICATION</th>
</tr>
</thead>
</table>
| Credibility       | Prolonged engagement in study area-setting as operating theatre nurse             | Researcher spent about 15-20 minutes with each group of participants to build rapport, explaining the purpose of the study and ethical issues involved.  
Researcher spent 30-45 minutes in conversation with participants. |
| Authority of researcher |                                                                                   | The researcher has undergone training in research methodology.                                              
An experienced researcher supervised the study. |
| Structural coherence |                                                                                   | The focus throughout the study was the compliance to UP in KZN hospitals in Area 3.                      |
| Literature control |                                                                                   | The findings were discussed with reference to relevant                                                |
studies and articles to establish commonalities and compare findings.

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangulation</td>
<td>The researcher recorded focus groups discussions and took field notes to collect data as well as method triangulation.</td>
</tr>
<tr>
<td>Peer examination</td>
<td>The study proposal was approved by the research committee of the school of nursing Science of the Potchefstroom Campus of the North-West University.</td>
</tr>
<tr>
<td>Reflexibility</td>
<td>The researcher examined her own perspective and this helped her to assess the insight, understanding and knowledge gained. This minimised biases.</td>
</tr>
<tr>
<td>Transferability</td>
<td>Purposive sampling of registered nurses was used</td>
</tr>
<tr>
<td>Data-collection</td>
<td>Focus group interviews were conducted until saturation was reached</td>
</tr>
<tr>
<td>Dense description</td>
<td>A comprehensive description of method was given, including themes, sub-themes and participants’ direct responses</td>
</tr>
<tr>
<td>Dependability</td>
<td>A peer debriefing was used</td>
</tr>
<tr>
<td>Dense description</td>
<td>Research methodology was clearly and fully described</td>
</tr>
<tr>
<td>Confirmability</td>
<td>The researcher was aware of her own perspective and tried to limit the effect of it in her interpretation.</td>
</tr>
<tr>
<td>Confirmability audit</td>
<td>The original data is kept for possible audit by an independent researcher.</td>
</tr>
</tbody>
</table>

3.5.6 Summary of Phase 2 research methodology

The summary of the Phase 2 research methodology is presented in Table 3.4.
**Table 3.4: Summary of Phase 2 Research Methodology**

<table>
<thead>
<tr>
<th>OBJECTIVE 2</th>
<th>POPULATION</th>
<th>SAMPLE</th>
<th>DATA-COLLECTION</th>
<th>DATA-ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PHASE 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To explore perceptions of registered nurses working in operating theatres</td>
<td>Registered nurses working in operating theatres</td>
<td>All registered nurses working in the operating theatre were purposively selected as they were supervisors of operating rooms.</td>
<td>During phase 2, three focus group interviews using semi-structured questions were conducted with registered nurses. Written informed consent was obtained from all participants. Voluntary participation was ensured. An interview schedule was used to guide the questions. Biographic information tool was used to collect biographic data from all participants.</td>
<td>The combination of the analysis procedure of Tesch 1990 in Creswell, (1994:155) and Heath (1997:3) was used to analyze the tape recorded data after a verbatim transcription. A thematic analysis with codes and subcodes of the interview transcriptions and field notes was performed. A co-coder was supplied with instructions and consensus discussions held until agreement was reached. The data was reconstructed by describing the development of themes, dialog with existing research and integration of concepts (Heath, 1997:3).</td>
</tr>
</tbody>
</table>
3.6 Ethical considerations

Throughout the research, the researcher ensured that the research was conducted in an ethical manner by applying the ethical principles as outlined by Brink et al. (2006:31).

The study was approved and received ethical clearance from the Ethics Committee of the North-West University (refer to Appendix A). Permission to collect data was obtained from the KwaZulu-Natal Provincial Department of Health’s research committee (Appendix B), the District Management of all three districts (Appendix C), and the Chief Executive Officers of all hospitals that were selected (Appendix D). The participants gave their informed consents to take part in the focus group interviews after they had each received a written explanation of the study (Informed consent - Appendix I, Additional information after data-collection - Appendix J) as well as the feedback information sheet (Appendix K). The researcher also undergone web-based training course on Protecting Human Research Participants conducted by The National Institutes of Health (NIH) Office of Extramural Research (certification number: 418572 refer to Appendix M).

3.6.1 Phase 1

In a study of this nature a full explanation of what specifically the researcher had to observe would cause participants to change their normal behaviour. Participants were therefore informed that practices in theatre would be observed using a checklist, without specific details. The researcher anticipated that health care workers might be uncomfortable knowing their behaviour was being observed. Informed verbal consent was obtained from everyone present in the operating theatres during the operations in order to be observed. During observation, the health care workers were not disrupted, but they were allowed to continue with their usual work. The researcher ensured that she was not distracting the HCWs as far as possible.

The code allocated to the hospital and the number of the case was used to identify the checklist. The names of the health care workers and the particulars of the patient were not entered in the checklist.

Confidentiality of the checklists was ensured, raw data (checklists) were kept in a locked cupboard at the School of Nursing Science of the Potchefstroom campus of the NWU; and would be kept for 5 years after which it will be destroyed.
Participants and patients were informed that they would not directly benefit from the research but may eventually benefit when strategies to enhance compliance to Universal Precautions are implemented.

With regard to the safety of the patient, the researcher would only deviate from her role as non-participative observer to intervene if actions that put the patient under increased risk were observed which did not happen.

According to the Research Ethics Guidelines of the National Department of Health (South Africa DOH, 2004:45) concealment of information to the participants, is only acceptable if the ethics committee is satisfied that:

“The provision of detailed information to prospective participants about the purpose, methods and procedures of the research would compromise the scientific validity of that research; the precise extend of deception, concealment or covert observation is defined; there are no suitable alternative methods, not involving deception, concealment or covert observation, by which the desired information can be obtained;

Participants were not exposed to an increased risk of harm as a result of the deception, concealment or covert observation;

Adequate and prompt disclosure was made and debriefing provided to participants as soon as practicable after the participation is completed.”

In this study it was necessary to conceal the purpose of the research to the participants that were going to be observed as the validity of the observation would have been compromised if the participants changed their behaviour when they knew what kind of practices the researcher was interested in (Hawthorne effect that would have threatened the validity of phase 1 the study).

They were informed that their behaviour during elective abdominal surgery would be observed, but not that the researcher was specifically interested in their practices related to universal precautions to prevent blood borne infections. They were fully informed as soon as it was practicable and were given the opportunity to withdraw data obtained from them during the time they were not fully informed. No person observed requested that their data must be removed.
No other method (e.g. audit) would provide the information regarding the compliance to UP (South Africa DOH, 2004).

### 3.6.2 Phase 2

The researcher provided adequate information by means of the participant information sheet (Appendix H) and ensured a clear understanding of the content. Participants gave their written informed consents to take part in the study after they had each received a written explanation of the study (Informed consent – Appendix I, additional information after data-collection – Appendix J). Permission to record the data was obtained prior to the interviews. All the ethical principles of research, namely respect for persons, beneficence, privacy and justice were taken into consideration.

Participants were informed about their right to participate or to withdraw from the study or to stop in the middle of the study if they were no longer comfortable. The participants were assured that they would not be coerced to continue and they would not be disadvantaged in any way by the researchers or the outcomes of the study. Participants were also informed about their right to request that data collected while they were not fully informed about the study must be withdrawn from the study.

Participants were informed that the results of this study would be to the benefit of patients, health care workers as well as the whole community through the interventions that will be introduced, but not as an individual. Small incentives were provided by the researcher after data-collection in the form of refreshments.

Anonymity and confidentiality of participants was ensured during transcription by assigning numbers to the participants according to their seating arrangement. The names of the hospitals they work in was also protected. Confidentiality of data (tapes and transcriptions) was also protected by storing data in a safe storage place; the tapes will be stored for a period of 5 years for future reference, and then destroyed.
3.7 Summary

In this chapter, the research design and methodology of phase 1 and phase 2 were discussed in detail. In the following chapter, the findings of both phase 1 and phase 2, and the interpretation and discussion of the findings will be discussed.
CHAPTER 4

FINDINGS AND DISCUSSION

4.1 Introduction

In the previous chapter the research design and methods were discussed in detail. A mixed-method design was used as the findings of the quantitative Phase 1 were used as base for the interview of the qualitative Phase 2. In this chapter, the findings of both phases 1 and 2 are discussed. The findings of the study are then compared to other published results.

4.2 Realization of Phase 1

The objective of this phase of the study was to explore and describe the practices regarding compliance with universal precautions in selected operating theatres in the Northern KwaZulu-Natal.

The data from six hospitals were included in the analysis of the checklist data. The researcher planned to observe UP related practices of health care workers in operating theatres in eight hospitals; but in two hospitals the researcher did not find any operations to be observed due to a shortage of doctors, all abdominal operations were transferred to the other hospitals. For each hospital, information on operating room procedures was recorded. Checklists were completed, documenting the UP related behaviours of the surgeon, assistant surgeon, scrub nurse, circulating nurse, anaesthetic doctor and anaesthetic nurse (Appendix F). Not all of the hospitals had the six (6) health care workers present at every observed procedure, and in some operations the surgical team consisted of only four (4) health care workers.

Compliance to UP on the checklist were categorized as (i) done (ii) not done (iii) partially done or not applicable. Because of the importance of compliance to UP, all instances with inadequate compliance with UP were recorded as ‘partially done’. The percentage recorded therefore only indicates the percentage of the total where compliance to UP
was correctly executed. An analysis of all the checklist subdivisions is presented in the following sections:

4.3 Findings of Phase 1

The findings of all the checklist subdivisions are presented in the following tables.

Question 1 was about the handling of body fluids with the same precautions as blood and comprises of the use of gloves, eye protection, protective clothing, as well as the correct disposal of potentially contaminated items.

Table 4.1: Handling of body fluids with the same precautions as blood

<table>
<thead>
<tr>
<th>Q1. Are body fluids handled with the same precautions as blood?</th>
<th>Hospital A</th>
<th>Hospital B</th>
<th>Hospital C</th>
<th>Hospital D</th>
<th>Hospital E</th>
<th>Hospital F</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>50/52(96.15)</td>
<td>9/12(75.0)</td>
<td>17/33(51.52)</td>
<td>21/30(70.0)</td>
<td>16/24(66.67)</td>
<td>12/20(60.0)</td>
</tr>
<tr>
<td>Gloves used</td>
<td>33/39(84.62)</td>
<td>3/8(37.5)</td>
<td>16/24(66.67)</td>
<td>0/22(0)</td>
<td>0/21(0)</td>
<td>8/15(53.33)</td>
</tr>
<tr>
<td>Eye protection used</td>
<td>36/54(66.67)</td>
<td>0/12(0)</td>
<td>16/34(47.06)</td>
<td>12/30(40.0)</td>
<td>2/24(8.33)</td>
<td>4/8(50.0)</td>
</tr>
<tr>
<td>Protective clothing used</td>
<td>29/30(96.67)</td>
<td>8/8(100)</td>
<td>19/19(100)</td>
<td>14/16(87.5)</td>
<td>12/24(50)</td>
<td>12/12(100)</td>
</tr>
<tr>
<td>Closed suctioning used</td>
<td>47/58(81.03)</td>
<td>2/8(25.0)</td>
<td>32/33(96.97)</td>
<td>30/30(100)</td>
<td>24/24(100)</td>
<td>14/15(93.33)</td>
</tr>
</tbody>
</table>

Different values were obtained for the different hospitals when it came to the use of gloves for body fluids with the highest percentage, 96.15 for hospital A and a low of 51.52 for hospital C. For hospital C, a high number of observations of partial compliance, 13/33 (39.39%), explained the low percentage. Hospital A used eye protection 33 times out of
39 times with the highest percentage of 84.62 for hospital A and a nil (0) percentage for hospital D and E. Protective clothing was poorly used in hospital E, and not used by hospital B. The use of protective clothing in all hospitals when handling body fluids had a very low score. Hospital E used closed suctioning 12 times out of 24 times with an average percentage of 50, but the majority of hospitals scored very high with the use of closed suctioning. The disposal of potentially contaminated items scored high in five hospitals, only in hospital B a low score of 25 percent was obtained.

Question 2 was about the avoidance of sharps injuries and comprises of the needles not being resheathed, sharps safely disposed of into the container, and all sharps items safely handled.

Table 4.2: Avoidance of sharps injuries

<table>
<thead>
<tr>
<th>Q2. Avoidance of sharps injuries</th>
<th>Hospital A</th>
<th>Hospital B</th>
<th>Hospital C</th>
<th>Hospital D</th>
<th>Hospital E</th>
<th>Hospital F</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (%)</td>
<td>58/58(100)</td>
<td>5/10(50.0)</td>
<td>30/30(100)</td>
<td>24/25 (96.0)</td>
<td>24/24 (100)</td>
<td>20/20 (100)</td>
</tr>
<tr>
<td>Sharps safely disposed of into container</td>
<td>52/58(89.66)</td>
<td>8/10(80.0)</td>
<td>31/33(93.94)</td>
<td>26/27 (96.30)</td>
<td>24/24 (100)</td>
<td>20/20(100)</td>
</tr>
<tr>
<td>All sharps items safely handled</td>
<td>40/58(68.97)</td>
<td>0/12(0)</td>
<td>33/33 (100)</td>
<td>19/30 (63.33)</td>
<td>24/24 (100)</td>
<td>19/20(95.0)</td>
</tr>
</tbody>
</table>

Although there was a generally high percentage of compliance in most hospitals, hospital B did not comply than the rest of the hospitals for all the divisions in this subsection. Hospital E recorded full compliance for all the divisions in this subsection. Safe disposal of sharps was done correctly in most of the hospitals with hospital B obtaining 80%, unlike in the recapping of needles (resheath) where hospital B scored poorly and obtained an average score of 50%. In safe handling of sharps items, hospitals C, E and F scored very high, while hospital B obtained 0.
Question 3 was about the avoidance of skin or mucous membrane contamination and comprises of cuts covered or dressed, double gloving if indicated, torn gloves changed and if hands were washed after removing of the gloves.

Table 4.3: Avoidance of skin or mucous membrane contamination

<table>
<thead>
<tr>
<th>Q3. Avoidance of skin or mucous membrane contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital A</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td><strong>N (%)</strong></td>
</tr>
<tr>
<td>Cuts covered/ dressed</td>
</tr>
<tr>
<td>Skin rash covered</td>
</tr>
<tr>
<td>Double gloving if indicated</td>
</tr>
<tr>
<td>Torn gloves changed</td>
</tr>
<tr>
<td>Hands washed after removing gloves</td>
</tr>
</tbody>
</table>

Most of the hospitals had no health care workers with visible cuts on hands and arms except for hospital A that scored 100% and complied with dressing of the cuts. None of the health workers had a visible skin rash on hands and arms and this is represented by the N/A (not applicable) recorded for those instances. Although there are 7 instances in all the observations where torn gloves were observed, only 2 health care workers from hospital A changed their torn gloves. The washing of hands after removing gloves was not done in hospitals B, D and E, and only hospital F obtained above 50 percent.

Question 3.2 was about the handling of blood and body fluids spillages on skin and comprises of the wearing of gloves, eye protection, plastic apron, spills wiped with paper, disinfectant used, correct disinfectant, strength and time used.
Table 4.4: Handling of blood and body fluids spillages

<table>
<thead>
<tr>
<th>Q 3.2 Blood/ Body fluids spillage on skin</th>
<th>Hospital A</th>
<th>Hospital B</th>
<th>Hospital C</th>
<th>Hospital D</th>
<th>Hospital E</th>
<th>Hospital F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
<td>N (%)</td>
</tr>
<tr>
<td>Gloves worn</td>
<td>41/58(70.70)</td>
<td>8/12(66.67)</td>
<td>21/36(58.33)</td>
<td>22/30(73.33)</td>
<td>16/24(66.67)</td>
<td>13/19(68.42)</td>
</tr>
<tr>
<td>Eye protection worn</td>
<td>31/47(65.96)</td>
<td>6/9(66.67)</td>
<td>16/24(66.67)</td>
<td>0/30(0)</td>
<td>0/16(0)</td>
<td>10/15(66.67)</td>
</tr>
<tr>
<td>Plastic apron worn</td>
<td>28/58(48.28)</td>
<td>0/12(0)</td>
<td>18/33(54.55)</td>
<td>12/30(40.0)</td>
<td>3/30(10.0)</td>
<td>12/19(63.16)</td>
</tr>
<tr>
<td>Spills wiped with paper</td>
<td>8/12(66.67)</td>
<td>2/2(100)</td>
<td>5/10(50.0)</td>
<td>N/A</td>
<td>N/A</td>
<td>4/4(100)</td>
</tr>
<tr>
<td>Disinfectant used</td>
<td>14/29(48.28)</td>
<td>0/2(0)</td>
<td>0/13(0)</td>
<td>6/6(100)</td>
<td>N/A</td>
<td>3/7(42.86)</td>
</tr>
<tr>
<td>Correct disinfectant, strength &amp; time used</td>
<td>6/26(23.08)</td>
<td>0/2(0)</td>
<td>0/12(0)</td>
<td>6/7(85.71)</td>
<td>N/A</td>
<td>7/11(63.64)</td>
</tr>
</tbody>
</table>

The compliance with the wearing of gloves when handling a spillage on skin scored poorly in all six hospitals. Partial compliance was common especially by the circulating nurses, anaesthetic nurses as well as anaesthetic doctors - all hospitals scored between 58%-70%. Eye protection was worn by the scrub team when handling blood and body fluids spillages, but in most hospitals compliance was poor, hospital D and E received nil as they did not use eye protection at all. The wearing of plastic aprons also scored poorly in all hospitals with hospitals B, D and E obtaining nil. Wiping of blood and body fluids spillages with paper scored 100% in hospitals B and F, but was not applicable in hospitals D and E and hospitals A and C did not comply. With the use of disinfectant only one
hospital received a 100% compliance, hospitals A, B and F did not comply, and in hospital E there was no spillage. With regards to the correct disinfectants used, strength and time used, hospital D scored 85.71% being the highest, followed by hospital E who received 63.64%, while hospitals A, B and C did not comply with the treatment of spillages.

Question 3.3 and 3.4 were about spray/ aerosol precautions, and decontamination of blood and other body fluids, which comprised of face/ eye protection, suction smoke/ aspirate laser, skin washed with correct soap and water, mouth and eyes washed copiously with water and skin puncture allowed to bleed.

Table 4.5: Spray/ Aerosol Precautions and Decontamination of blood and other body fluids

<table>
<thead>
<tr>
<th>Q 3.3 Spray/ Aerosol Precautions, and Q 3.4 Decontamination of blood &amp; other body fluids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
</tr>
<tr>
<td>Face/ Eye protection used</td>
</tr>
<tr>
<td>Suction smoke/ aspirate laser</td>
</tr>
<tr>
<td>Skin washed with correct soap &amp; water</td>
</tr>
<tr>
<td>Mouth &amp; eyes washed copiously with water</td>
</tr>
<tr>
<td>Skin puncture allowed to bleed</td>
</tr>
</tbody>
</table>
The eye and face protection compliance was poor in all hospitals - hospital A had the highest percentage of 68.97% while hospital B did not use eye protection, thus no compliance. Of the 30 eligible health workers in hospital D, all (100%) were partially compliant and were coded as partially done. Suction smoke of diathermy was not done in most of the hospitals since diathermy was not used during the operation, but hospital A scored a 100% compliance while hospital C scored 33.33%. With regards to skin washed with the correct soap and water, only hospital A complied but in the rest of the hospitals this procedure was not applicable. The washing of the mouth and eyes was not applicable for all hospitals. Skin puncture allowed to bleed compliance was partially done in hospital A with a percentage of 53% while in the rest of the other hospitals, this was not applicable.

Question 4 was about cleaning/disinfection/sterilizing of equipment, correct scrubbing, gowning and donning of gloves and correct use of materials.

Table 4.6: Cleaning/Disinfection/Sterilizing

<table>
<thead>
<tr>
<th>Q4. Cleaning/Disinfecting/Sterilizing</th>
<th>Hospital A</th>
<th>Hospital B</th>
<th>Hospital C</th>
<th>Hospital D</th>
<th>Hospital E</th>
<th>Hospital F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equipment sterile</td>
<td>58/60(96.67)</td>
<td>12/12(100)</td>
<td>33/33(100)</td>
<td>29/32(90.63)</td>
<td>19/19(100)</td>
<td>20/21(95.24)</td>
</tr>
<tr>
<td>Trolleys cleaned/Disinfected</td>
<td>26/30(86.67)</td>
<td>5/5(100)</td>
<td>18/18(100)</td>
<td>18/21(85.71)</td>
<td>11/12(91.67)</td>
<td>13/13(100)</td>
</tr>
<tr>
<td>O. R. Clean/Damp dusted</td>
<td>30/32(93.75)</td>
<td>4/7(57.14)</td>
<td>17/17(100)</td>
<td>18/22(81.82)</td>
<td>10/13(76.92)</td>
<td>12/13(92.31)</td>
</tr>
<tr>
<td>Correct type of sterilizer/disinfectant used</td>
<td>28/32(87.5)</td>
<td>6/6(100)</td>
<td>18/18(100)</td>
<td>18/22(81.82)</td>
<td>12/12(100)</td>
<td>14/14(100)</td>
</tr>
<tr>
<td>Disinfectant correctly used</td>
<td>16/32(50)</td>
<td>1/5(20)</td>
<td>16/17(94.12)</td>
<td>18/22 (81.82)</td>
<td>12/12(100)</td>
<td>14/14(100)</td>
</tr>
<tr>
<td></td>
<td>Correct strength</td>
<td>15/32(46.88)</td>
<td>1/6(16.67)</td>
<td>10/17(58.82)</td>
<td>18/22(81.82)</td>
<td>12/12(100)</td>
</tr>
<tr>
<td>---------------------</td>
<td>------------------</td>
<td>--------------</td>
<td>------------</td>
<td>--------------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>Gloves worn when handling equipment</td>
<td>57/60(95.0)</td>
<td>9/12(75.0)</td>
<td>29/33(87.88)</td>
<td>20/33(60.60)</td>
<td>17/24(70.83)</td>
<td>15/20(75.0)</td>
</tr>
<tr>
<td>Apron worn</td>
<td>30/32(93.75)</td>
<td>0/6(0)</td>
<td>17/21(80.95)</td>
<td>12/24(50.0)</td>
<td>3/24(12.50)</td>
<td>12/20(60.0)</td>
</tr>
<tr>
<td>Sharp equipment protected</td>
<td>42/60(70.0)</td>
<td>6/12(50.0)</td>
<td>28/32(87.50)</td>
<td>14/35(40.0)</td>
<td>24/24(100)</td>
<td>19/20(95.0)</td>
</tr>
<tr>
<td>Equipment washed before being sterilized</td>
<td>29/31(93.55)</td>
<td>4/6(66.67)</td>
<td>17/17(100)</td>
<td>6/16(37.50)</td>
<td>8/10(80.0)</td>
<td>10/10(100)</td>
</tr>
<tr>
<td>Correct scrubbing, gowning, donning of gloves</td>
<td>30/39(76.92)</td>
<td>4/4(100)</td>
<td>8/12(66.67)</td>
<td>12/17(70.59)</td>
<td>12/16(75.0)</td>
<td>12/14(85.71)</td>
</tr>
<tr>
<td>Correct use of materials</td>
<td>39/58(67.24)</td>
<td>7/12(58.33)</td>
<td>24/33(72.73)</td>
<td>15/28(53.57)</td>
<td>15/24(62.5)</td>
<td>19/19(100)</td>
</tr>
<tr>
<td>Materials sluiced before laundering</td>
<td>21/21(100)</td>
<td>5/5(100)</td>
<td>6/15(40.0)</td>
<td>0/16(0)</td>
<td>4/6(66.67)</td>
<td>7/7(100)</td>
</tr>
<tr>
<td>Soiled linen discarded in appropriate plastic bags &amp; bins</td>
<td>58/58(100)</td>
<td>6/11(54.55)</td>
<td>27/31(87.10)</td>
<td>23/26(88.46)</td>
<td>23/23(100)</td>
<td>19/20(95.0)</td>
</tr>
<tr>
<td>Correct colour coding of plastic bags</td>
<td>57/58(98.28)</td>
<td>6/12(50.0)</td>
<td>31/31(100)</td>
<td>24/26(92.31)</td>
<td>18/21(85.71)</td>
<td>19/20(95.0)</td>
</tr>
<tr>
<td>Wipe spills with paper</td>
<td>0/2(0)</td>
<td>1/1(100)</td>
<td>1/14(7.14)</td>
<td>N/A</td>
<td>N/A</td>
<td>8/8(100)</td>
</tr>
<tr>
<td>Discard paper in red plastic bag</td>
<td>2/6(33.33)</td>
<td>1/1(100)</td>
<td>3/14(21.43)</td>
<td>N/A</td>
<td>2/2(100)</td>
<td>14/14(100)</td>
</tr>
<tr>
<td>Use disinfectant over the area</td>
<td>0/2(0)</td>
<td>0/1(0)</td>
<td>0/14(0)</td>
<td>N/A</td>
<td>N/A</td>
<td>0/9(0)</td>
</tr>
</tbody>
</table>
Hospital B and hospital C and E had the highest compliance when it came to the sterilization of equipment, all 100%, while hospital D had the lowest compliance of 90.63%. Hospital C and F was compliant in washing equipment before sterilization with a percentage of 100%, hospital A complied with a percentage of 94%, hospital E complied with a percentage of 80% and hospital B did not comply with 66%, while hospital D was poorly compliant with a percentage of 38%. The correct sterilizer or disinfectant was not always used - hospital A used the correct disinfectant or sterilizer 87.5% of the time and hospital D was less compliant (81.82%), while the rest of the hospitals used the correct disinfectant/sterilizer in all observed instances. Hospital B had the lowest percentage in the correct usage of the disinfectant / sterilizer, namely 20%. Hospital A used the disinfectant correctly 50% of the time while Hospitals C, D, E and F had a percentage of 80 or more.

With regards to scrubbing, gloving, and gowning hospital B complied excellently with a percentage of 100%, hospital F followed with a percentage of 85%, hospital E scored 75%, hospital D scored 70.59%, while hospital C did not comply with a percentage of 60%. The sluicing of materials before laundering was best complied with by hospital A, B and F with a percentage of 100%, while hospital E did not comply with 67%, hospital C with 40% and hospital D did not comply. The discarding of soiled linen in appropriate bags was fully complied with by hospital A and E with a percentage of 100% followed by hospital F with 95%, hospital D with 88%, hospital C with 87% while hospital B did not comply with 66%. Colour coding of plastic bags was fully complied with by hospital C (100%), followed by hospital A with 98% followed by hospital F with 95%, hospital D with 92%, hospital E with 85% and the partial compliance of hospital B with 50%.

While there is mostly good compliance to UPs during abdominal operations, there were instances of partial compliance. The use of the incorrect materials is also a concern as this could lead to unsafe operating conditions. Compliance to UPs was reached when the score was 80% and above according to IPC guidelines (South Africa DOH and KZN DOH, 2007).

In the next section, the findings of Phase 2 regarding the factors influencing compliance to UP were discussed.
4.4 Findings of Phase 2

The objective addressed in this phase of the study was to explore and describe perceptions of professional nurses working in operating theatres in Northern KwaZulu-Natal regarding factors influencing compliance with universal precautions. The findings of phase 1 were used to formulate the focus group interview schedule (Appendix L).

The researcher and research assistant used a focus group interviews schedule as recommended by Babbie (2010: 256) to obtain the desired information, it was necessary to guide participants by asking specific questions (appendix L). The trial run was conducted at one of the sites to test the interview guide and data-collection procedure. The results were included in data-analysis as no adaptations were necessary.

Three focus groups, each comprising of four participants were conducted. The participants were from three hospitals, working in operating theatres.

4.4.1 Biographic profile of participants

The characteristics of the participants are provided in table 4.7. From the table it can be seen that all participants completed the biographical questionnaire.
Table 4.7 Characteristics of focus group participants:

RN (Registered nurse), RM (Registered midwife), CHN (Community Health nurse), Psych/N (Psychiatry nurse), DOTNS (Diploma in Operating theatre nursing science), and HSM (Health service management)

<table>
<thead>
<tr>
<th>Focus group 1</th>
<th>Age</th>
<th>Experience in OT</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>35 yrs</td>
<td>10 yrs</td>
<td>RN, RM, DOTNS, CHN, Psych/N,</td>
</tr>
<tr>
<td>Participant 2</td>
<td>45 yrs</td>
<td>11 yrs</td>
<td>RN, RM, Psych/N, CHN,</td>
</tr>
<tr>
<td>Participant 3</td>
<td>34 yrs</td>
<td>01 yr</td>
<td>RN, RM, Psych/N, CHN</td>
</tr>
<tr>
<td>Participant 4</td>
<td>31 yrs</td>
<td>01 yr</td>
<td>RN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Focus group 2</th>
<th>Age</th>
<th>Experience in OT</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>48 yrs</td>
<td>20 yrs</td>
<td>RN, RM, HSM, CHN, DOTNS</td>
</tr>
<tr>
<td>Participant 2</td>
<td>38 yrs</td>
<td>14 yrs</td>
<td>RN, DOTNS</td>
</tr>
<tr>
<td>Participant 3</td>
<td>45 yrs</td>
<td>03 yrs</td>
<td>RN, DOTNS</td>
</tr>
<tr>
<td>Participant 4</td>
<td>34 yrs</td>
<td>04 months</td>
<td>RN, RM</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Focus group 3</th>
<th>Age</th>
<th>Experience in OT</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>41 yrs</td>
<td>15 yrs</td>
<td>RN, RM, DOTNS</td>
</tr>
<tr>
<td>Participant 2</td>
<td>55 yrs</td>
<td>10 yrs</td>
<td>RN, RM, DOTNS, CHN</td>
</tr>
<tr>
<td>Participant 3</td>
<td>55 yrs</td>
<td>09 yrs</td>
<td>RN, RM, DOTNS</td>
</tr>
<tr>
<td>Participant 4</td>
<td>43 yrs</td>
<td>15 yrs</td>
<td>RN, RM, CHN</td>
</tr>
</tbody>
</table>
Participants completed the biographical questionnaire as requested, and it consisted of gender, ethnic group, age, experience in the operating theatre and qualifications. All participants were females, and all were blacks.

- **Age distribution of focus group participants**

The ages of the participants ranged between 26-55 years. There is a variety in age distribution from neophytes to adult professional nurses, which enhances compliance to UP, since the young professional nurses observe and gain more knowledge from adults. Research reported that older professional nurses, because of their experience and tradition, may be resistant to change their behaviour towards UP (Osborne, 2003:420). In the focus group, some of the participants complained of changes to infection prevention and control and universal precautions.

![Age distribution of focus group participants](image)

**Fig: 4.1 Age distribution of focus group participants**

- **Length of service in the Operating Theatre of focus group participants**

The majority of participants (50%) have more than 10 years of experience working in the operating theatre, and they would be able to give valuable information about UPs. Four participants have three years and less experience, are still learning more about the operating theatre environment, UP principles and guidelines.
Fig: 4.2 The length of service in OT of participants

- Qualifications of participants

Seven out of twelve participants (58%) are specialised in operating theatre, which can contribute to an improved compliance to UP. Knowledge and skills of operating theatre environment and the use of the aseptic technique also promote compliance to sterility and UP. Osborne (2003:420) suggests that perceptions of barriers have a significant influence on compliance to UP.

The operating theatre working environment and professional nurses' ability to provide quality nursing care are primary motivators to comply with UP. Only one participant had a Health Service Management qualification in this group, which implies that most of the participants had limited managerial background needed for provision of quality nursing care.
Non-compliance with UP is affected by different factors such as age, level of training, experience in using UP, knowledge, attitudes and practice patterns (Chan et al., 2007:1053; Gershon et al., 1995:227).

4.4.2 Themes and subthemes

The interview schedule was based on the results of the first phase- the exploring and description of the compliance to Universal Precautions against infection as practiced in the operating theatre. Six questions (see interview schedule Appendix 13) were asked during the focus groups in order to analyse and describe perceptions of professional nurses working in operating theatres in Northern KwaZulu-Natal regarding factors influencing compliance with universal precautions. The following four themes emerged from the data:
Table 4.8: Themes and subthemes

<table>
<thead>
<tr>
<th>Theme</th>
<th>Subthemes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge of Universal Precautions</td>
<td>Sufficient knowledge</td>
</tr>
<tr>
<td></td>
<td>Limited knowledge</td>
</tr>
<tr>
<td>Communication as a factor influencing compliance to UP</td>
<td>Communication between nurses</td>
</tr>
<tr>
<td></td>
<td>Interdisciplinary communication</td>
</tr>
<tr>
<td></td>
<td>Changes are not communicated</td>
</tr>
<tr>
<td>Resources and compliance to Universal Precautions</td>
<td>Poor maintenance of equipment</td>
</tr>
<tr>
<td></td>
<td>Lack of supplies</td>
</tr>
<tr>
<td></td>
<td>Unsuitable and uncomfortable protective clothing</td>
</tr>
<tr>
<td></td>
<td>Shortage of human resources</td>
</tr>
<tr>
<td>Attitudes of health care workers</td>
<td>Positive attitudes</td>
</tr>
<tr>
<td></td>
<td>Negative attitudes</td>
</tr>
</tbody>
</table>

Each of these themes with its subthemes and responses will be discussed and illustrated by meaningful quotes or excerpts and supported by a literature control. The excerpts, which serve as support evidence, are marked as follows – FG 1 – P1 – meaning focus group 1 and participant 1.

4.4.2.1 Knowledge of universal precautions

The first theme was related to knowledge. This theme has two subthemes namely sufficient knowledge and limited knowledge.

Health care workers should be equipped with requisite knowledge, skills and attitudes for good practices of Universal Precautions, which must be applied to all patients at all times regardless of diagnosis and infectious status (WHO, 2003:6). Figure 4.3 reports on basic and post basic theatre training of nurses working in the operating theatre, of which the majority of participants are specialised in operating theatre nursing. The professional nurses interviewed had from more than three months up to twenty years of experience working in the operating theatre.
Table 4.9: Themes, subthemes and related issues with regard to Knowledge

<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
<th>Related issues</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Sufficient knowledge</td>
<td>• In-service education</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Demonstrating</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Spring cleaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Orientation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Induction course</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Teaching on thorough cleaning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Culture of compliance</td>
</tr>
<tr>
<td>Limited knowledge</td>
<td></td>
<td>• Ignorance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Changes in infection control practices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Doctors are recapping and needle prick injuries</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lack of experience</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lack of training</td>
</tr>
</tbody>
</table>

- **Sufficient Knowledge**

The professional nurses interviewed mentioned that HCWs had sufficient knowledge as they were given different forms of training. Participants in this study were asked about factors that promoted compliance to UP in their operating theatre and the whole group agreed that they believe in employees’ education and training within the team.

The following quotations attest to the discussions: “In-service education that is done every morning. First for, we start with in-service education and by doing demonstration, by demonstrating how to scrub, how to put sterile gloves, and gowning.” (FG1P2).
Other studies also recommended training of HCWs, which include in-service education, demonstrations, and coaching (Pham, 2007:7; Helfgott et al., 1998:126).

Teaching about the thorough cleaning of the operating environment was also mentioned by one group of participants in this study as a means of compliance to UPs in the operating theatre. “We also do the spring cleanings on the weekends there on Saturdays we do thorough cleaning it also limits the risk of infection this may help, so we do the thorough cleaning so everybody is allocated to that as there are some people who are there to supervise to see if everything is done well this will limit the risk of infection to the operations” (FG1P1). HCWs strive for excellence in environmental safety (as part of universal precautions) and modification of environment in the operating theatre was therefore suggested to promote compliance to UPs (Hold et al., 2011:60).

Orientation and induction of newly employed HCWs was recommended by participants to improve knowledge and compliance with UP. “(During) orientation she is being told about everything, she is shown everything but then when it comes to practicality if you do it correctly inside he or she will learn it correctly from the onset. If after scrubbing you remove your gown and gloves and then you go and wash hands” (FG3P3).

One participant in a group described how the induction course is done in private hospitals for all newly employed health care workers and also recommends a standardised approach for all hospitals. “I think we need to do like the private hospitals where they have the in-service, the induction course for the whole week for all the new staff, they are shown the correct things for the whole week, before they are exposed to the institution”(FG3P2).

According to Mbanya et al. (2010:2090) training and refresher courses offered to HCWs on infection prevention and control practices improve compliance to UP. In their study they found that five HCWs in Cameroon attended a 5-day workshop in another institution of the city and on their return, they had to train their colleagues on IPC practices.

One of the participants highlighted the importance of setting a good example for others. This may be important in creating a culture of compliance:

“He or she is here because she is observing what you do so that she will do correctly. So if you do it correctly, she will do the correct thing because she will know that I saw her, the one that taught me she said I must do like this and that will be the thing (FG3P2)”.
Findings of the study conducted by Zungu et al. (2007) on learners reported that experience of working in the operating theatre also contributes towards gaining of knowledge with regards to universal precautions.

**Limited knowledge of UPs**

When questioned on the factors that contribute to non-compliance to UP in some hospital settings participants indicated some HCWs were inexperienced and ignorant. “Sometimes its ignorance because you will find that PPE (personal protective clothing) is there for people to use but due to ignorant sometimes they don’t use it, but they are touching these body fluids” (FG2P2).

“Sometimes may be is the lack of in-service education maybe especially the newly employed or the students if he fails to get thorough orientation when he comes to operating theatre (FG1P3)”

Inadequate knowledge as a factor leading to non-compliance was also found in other studies (Osborne, 2003:415; Askarian et al., 2006:593; Chan et al., 2007:1053, Nwankwo & Aniebue, 2010:34).

Participants in this study also raised concerns about the use of old methods when they are not updated with regards to new developments in their practice and this has a negative impact on compliance to Universal Precautions as indicated in the following excerpt “They are non-compliant because sometimes they are using old methods. So the staff needs to be, to go for in-service training and need to be updated now and again if there is a change” (FG1P1). Research has reported that differences in standards of practice of UPs are a contributing factor to non-compliance (SATS, 2011:9).

During interviews, participants also mentioned that other professionals, for example doctors, especially the interns and anaesthetists still recap needles when they are not supposed to according to UP guidelines. In two hospitals, participants reported incidents of needle prick injuries to HCWs. “We are having a problem with doctors who are recapping whereby recapping is not allowed” (FG3P2).

In a study conducted by Mbanya et al. (2010:2092) it was reported that 75.7% of participants were still recappping needles after use. Findings of the study of Findlay (2003:16) recommended that safe disposal of sharps particularly the contaminated
hollow-bore needles, which are often haphazard, is the responsibility of the practitioner. It further states that one third of full-time practicing anaesthesiologists or anaesthesia doctors experience a blood contaminated needle stick injury per year. Surgical operations were the commonest procedures being carried out at the time of exposure through needle prick injuries, blood splashes and non-sharp instrument injuries (Nwankwo & Aniebue, 2010:35).

The theme of “knowledge” was quite common and it was often identified as a reason for non-compliance. This broad term of knowledge includes issues such as the lack of knowledge on the part of the medical team as well as a lack of training regarding policy or system changes. The participants generally felt that in-service training was something of an all-encompassing solution to most of the non-compliance issues that had been experienced.

The participants displayed a lack of knowledge regarding the suction of smoke when using the diathermy. This may be a result of ineffective training in the hospitals, or poor attention paid by the staff during the trainings. In this instance, the interviewer actually educated the participants in one focus group interview on this issue: “Ya, When there are, we use the, as we are doing this err caesarean section we are using the suction, if the doctor is using the diathermy we must just suck the smoke with that suction to prevent the smoke to go out right round the room” (Interviewer).

The participants in this study reported that various degrees of success in improving the uptake of universal precautions have been achieved through the education and training of HCWs. Inadequate training of health care workers was also cited as a reason for non-compliance and hindered the practice of universal precautions (Nsubuga & Jaakkola, 2005).

4.4.2.2 Communication as a factor influencing compliance to universal precautions

The second theme relate to communication as factor influencing compliance to universal precautions, consists of three subthemes. Participants in this study reported poor communication between doctors and nurses, as well as interdisciplinary communication, and the lack of communication of changes as contributing factors to non-compliance to universal precautions.
Table 4.10 Themes, subthemes and related issues with regard to communication

<table>
<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
<th>Related issues</th>
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<tbody>
<tr>
<td>Communication</td>
<td>Communication between nurses</td>
<td>• Communicate to encourage staff</td>
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<td></td>
<td></td>
<td>• Remind each other</td>
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<td></td>
<td></td>
<td>• Lines of reporting</td>
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<tr>
<td>Interdisciplinary</td>
<td>The doctors do not want to be cautioned by the nurse</td>
<td></td>
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<tr>
<td>communication</td>
<td></td>
<td>• UPs preferences not considered</td>
</tr>
<tr>
<td>Changes are not</td>
<td>UPs keep changing</td>
<td></td>
</tr>
<tr>
<td>communicated</td>
<td>Changes of infection control practices</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implementation of changes</td>
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<td></td>
<td>Lack of accountability</td>
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- Communication between nurses

Good communication skills are needed before the patient undergoes a surgical procedure. The communication to the ward in preparing the patient, during the procedure with the doctors and everyone who is available during the procedure was mentioned as vital as indicated in the following excerpts: “Communicate and encourage the staff to attend to the UPs before operation (FG1P2).”

“We remind each other even if the things that we tell ourselves are familiar with this but we do on weekdays before we commence our duties”(FG1P2).

The American Board of Nursing Specialties (2005) also mentioned the dissemination of information to other HCWs as important to demonstrate achievement of standards and promote optimal health outcomes in the operating theatre. Findings of other studies reported that regular team briefings promote teamwork, communication and compliance to UP critical to a safe environment in the operating theatre (Flin et al., 2009:27). Some of the quotes from the interviewees suggest that the clear delineation of duties and clear understanding of reporting lines are effective in enhancing compliance with infection control procedures:
“We get by sister who is allocated for infection control here in this theatre (FG1P3)”

This example shows that the participant is aware of who to report to regarding infection control. The next example illustrates how information is transmitted by a person responsible for the training of new policies or procedures:

“Like if someone has gone for a workshop somewhere she or he when comes back will tell us what has been discussing there if there is the thing that they do differently, and then he or she will tell us that she has learnt that we then practice it it’s like we get some new information (FG1P2)”.

- Interdisciplinary communication

Interdisciplinary communication was also viewed as vital although doctors were not keen on being cautioned by nurses. “We do because we even try the doctors though most of them they don’t want to be cautioned by nurses they simple tell you that I don’t remember seeing you (FG3P1) In the corridor being one of my colleagues (FG3P4)”. Findings from other studies also found that communication with doctors is a factor influencing compliance to UP (Flin et al., 2009: 27; SATS, 2011:21).

Interdisciplinary communication is also necessary for proper supply of working materials when communicating with stores’ workers. Participants raised concerns regarding incorrect supply of working materials such as protective clothing, preferences not being considered when making orders and the unavailability of working materials such as goggles, although they had several meetings with stores department. “Even if you go and explain it to them they provide us with other options, you should have visors as well as these goggles, goggles. So we get one supply visors only” (FG3P2).

Findings of other studies, Okechukwu (2009:66) done in Nigeria and Mbanya et al. (2010:2090) done in Cameroon, also reported a lack of regular supplies such as goggles and face shields as a cause of non-compliance to UP in operating theatres.

- Changes in UPs are not communicated

Changes in the operating theatres seem not to be communicated to HCWs and this was said to contribute to non-compliance to UP. Dissatisfaction with the manner in which changes are implemented amongst health care workers in the operating theatre was
mentioned by one group of participants as this influence non-compliance to Universal Precautions. “Most hospitals were not compliant because UPs keep changing” (FG2P3). Participants did not know about changes of Infection Prevention and Control practices and poor practices in health systems as reported by Cullinan (2006:20). “I think it’s because of these changes in infection control practices” (FG3P). Orientation of HCWs on new products is essential in Infection Prevention and Control practices and Universal Precautions (WHO, 2003: 6).

One of the participants was discussing the use of a certain type of disinfectant. In this discussion, the participant mentioned that they were not sure whether the new disinfectant that had been introduced was better than the previous one or not.

“Mmh, we are still using but, were, on the discussion whether we are going to stop using this Biocide and use this cleaning, 5 litre ongaka manje so big, is something new we are still not sure ukuthi isebenza kungcono kune Biocide D if its better than Biocide D (FG2P2). The participant talks about the effectiveness of the new disinfectant as if it is something that the nursing staff are responsible for. This was further explored and shows a lack of communication between the management and staff.

When the participants were talking about disinfecting methods, one of them illustrated the lack of clear communication amongst the staff from management:

“Laughing, sometimes our machines in CSSD are out of order then we have to send people to KwaMagwaza or to Ekhombe for sterilization (of instruments and linen). So it was happening err last week we had a problem but I heard that a guy came to repair those machines, one day so they are able to sterilize (FG2P2)

There appeared to be a lack of accountability in the infection control procedure adherence framework: “And what I have noticed even in Durban nobody wears them, they don’t wear them except, they only look at you that you have got something that covers your fingers (feet) if something falls on you, you don’t get injured but you don’t stress that mmh (FG3P2). The participant pointed out that at the most someone will check if there is a covering over one’s feet, regardless of whether they are the correct footwear or not.
4.4.2.3 Resources as a factor influencing compliance to universal precautions

The third theme relates to the role of resources in the compliance to universal precautions, and consists of five subthemes. The participants explained that poor maintenance of equipment, lack of water supply, lack of supplies including unsuitable and uncomfortable protective clothing as well as the shortage of human resources contribute to non-compliance to UP. Management have the role to provide resources and facilities for ensuring a safe working environment and proper implementation of universal precautions (Isah et al., 2009:169).

Table 4.11: Themes, subthemes and related issues with regard to resources

<table>
<thead>
<tr>
<th>Themes</th>
<th>Sub-themes</th>
<th>Related issues</th>
</tr>
</thead>
</table>
| Resources               | Poor maintenance of equipment                   | • Machines in CSSD are out of order  
                           |                                                                                   | • Air-conditioning system is not working  |
|                        | Lack of water supply                            | • Use sterile water when we don’t have water supply  
                           |                                                                                   | • Use 25 litre of water for scrubbing  |
|                        | Lack of supplies                                | • Insufficient materials and supplies due to shortage of stores  
                           |                                                                                   | • Shortage of safety equipment  
                           |                                                                                   | • Lack of supplies lead to needle prick injuries  
                           |                                                                                   | • Supplied with expired stock  |
| Unsuitable and uncomfortable protective clothing |                             | • Visors causing mist and cannot see during operation  
                           |                                                                                   | • Plastic aprons cause sweat and discomfort  
                           |                                                                                   | • Plastic boots spread infection of feet and are uncomfortable  |
| Shortage of human resources |                                                   | • Forgot because sometimes you are rushing to prepare for the other due to shortage of staff  
                           |                                                                                   | • On the day we have 5 or 6 operations, maybe one operation takes 4 to 5 hours  |

- Poor maintenance of equipment

Sometimes participants mentioned that equipment had to be sent to other hospitals for sterilization as their own hospital did not have sterilizing facilities due to poor
maintenance. This problem was reported to have been happening for many years as indicated in the following excerpt: “Machines in CSSD are out of order then we have to send equipments to other hospitals for sterilization” (FG2P2). Cullinan, (2006: 21 ) also reported malfunctioning equipment and poor management of resources at every level of the Department of Health, and a lack of proper implementation of universal precautions are exacerbating problems in operating theatre.

Participants, when questioned about the use of visors, reported malfunctioning of air-conditioning systems and visors become misty. The discomfort contributes to them not complying to universal precautions. “It happens if the aircon (air conditioning system) is not working” (FG1P2). Frequent maintenance and validation of the efficacy of filters should meet basic safety standards, because 20 air changes per hour provide clean air in operating theatres (WHO, 2003:14; Hold et al., 2011:61). In a study conducted by Isah et al. (2009:166) participants reported that the lack of infrastructure and poor working conditions influence adherence and compliance to UP are important factors to increase compliance to UPs.

- **Lack of water supply**

If resources like tap water are not available, it influences non-compliance to UP and the misuse of resources. In the context of limited finances and resources, it could lead to not having enough money to buy other supplies necessary to limit infection. Participants described how they had to cope with a lack of water, like using sterile water for scrubbing to do operations. “Use sterile water when we don’t have water supply” (FG2P2).

“In fact inside the scrub room we have a 25 litre of water all the time so that when there is no water, he will scrub and pour and pour everybody until we finish (FG3P3) from tanks inside the hospital (FG3P2)”. The irregular availability of water supply was also found as a constraint to hand washing and UP practices in a study conducted in Nigeria (Okechukwu, 2009:68).

The health care facility, especially the operating theatre should provide safe water and have emergency water storage tanks, which should be cleaned regularly and the quality of water should be sampled periodically to check for bacterial contamination (WHO, 2003:16). Consistent provision of appropriate resources demonstrates the presence
visible and commitment of management to safety and compliance to UP in the operating theatre (Flin et al., 2009:16).

- **Lack of supplies**

Lack of supplies was another aspect attributed to poor compliance and participants stated that they often had to borrow from neighbouring wards as indicated in the following quotes: “It has happened that some of the things we borrow from wards outside, sometimes it’s nowhere to be found in the hospital” (FG1P1).

Examples of supplies that were said to be in shortage were gloves and surgical masks, “Insufficient material also contributes “(FG1P2); we don’t have gloves “(FG1P4), we don’t have the enough surgical masks “(FG1P1). Insufficient working materials such as gloves, surgical masks and other supplies were also reported in other research studies as a contributing factor to non-compliance (Gershon et al., 1995:225; Kermode et al., 2005:28).

Shortage of safety equipments such as safety needles and reinforced surgical gowns was raised by participants as a frustrating issue as indicated in the following quotes:

In two groups participants also reported incidents of needle prick injuries in doctors.

“It has occurred last month to doctor when he was pricked by a needle while he was suturing” (FG3P4). Surgical operations were the commonest procedures being carried out at the time of exposure through needle prick injuries, blood splashes and non-sharp instrument injuries (Nwankwo & Aniebue, 2010:35).

Safety needles, which assist in preventing sharp injuries, were also in short supply

“We once had safety needles, and it has just come to the new stock we have added in the cash flow, have re-ordered but it has not come, but we have not been using them. It was just the ordinary needles “(FG3P3)

Research have shown that the use of safety needles decrease the incidence of needle prick injuries, and routine use of safety equipments have been recommended by the CDC (Findlay, 2003:15).

In addition participants were issued expired stock from the stores department.
“If you order from stores they give you the same expired stock” (FG2P2).

“Every time when we order it is out of stock so we decided to keep them until they tell us they have them, endotracheal tubes for infants 2,5mm (FG1P1), corrugated drains that one expired in 2008”. (FG1P2)

Continuous availability of protective clothing and supplies as well as proper training of health care workers for proper use are essential according to the WHO (2003:9).

- Unsuitable and uncomfortable protective clothing

Participants also described that universal precautions were sometimes not complied with due to uncomfortable and unsuitable protective clothing. If visors must be used, because goggles are not available, the HCWs avoid the use of visors as they cannot see due to sweating, as indicated in the following quotes:

“Whether it’s the specs or the visors or the goggles the thing is just the same but if you wear the visor sometimes you feel that you become stuffy and then you cant see but most of the people they are wearing them” (FG3P)

“Some staff members complain that they experience discomfort like some of the doctors, they don’t use plastic aprons but going to say hey this thing, they don’t like this thing (FG2P1), and it’s because of sweating, sometimes they don’t wear those plastics aprons (FG2P3)”. The lack of compliance to UP as an approach to Infection Prevention and Control to treat all human blood and body fluids, such as the correct use of protective clothing, was also found in a study conducted by Zungu et al. (2008:48c).

Participants occasionally admitted their own misbehaviour with regards to the wearing of plastic boots and reported that some HCWs complained of contracting infection.

“They don’t like these boots because they say fungal infection they don’t trust us that we wash these plastic boots, they prefer to use these overshoes on their shoes because they lack trust that we really wash these boots” (FG2P2).

Participants continued to say things that contribute to non-compliance with protective clothing. They prefer not to wear plastic boots and are not complying with UP. “Its damaging the stockings after you are finishing you see that the stocking is damaged, they are also not comfortable (FG1P3), and the other thing is its too big for us (FG1P2)”. The
findings from other studies that contribute to non-compliance to UP are a lack of appropriate resources reported by Kermode et al. (2005:32).

- Shortage of human resource

A shortage of personnel in operating theatres was also a concern as they had to rush after completion of an operation to prepare for the next operation and this shortage results in non-compliance to UP. Sometimes there was only one team on duty in the operating theatre, participants in this study were not relieving each other for tea breaks and lunch time resulting in taking awkward tea times and breaking the chain of infection by not washing hands before touching food and thus not complying with UP policy. The following excerpts bears testimony to the discussions,

“it’s the time for instance after maybe on the day we have 5 or 6 operations, maybe the operation, maybe one operation takes 4 to 5 hours after operation you are hungry and you just rush for food and forget to wash hands” (FG1P2).

“They forgot because sometimes you are rushing to prepare for the other” (FG1P2), Sometimes the person is on a hurry and just forgets to put on gloves” (FG2P4).

Other research studies have reported massive shortages of health care workers in all countries, including developed countries leading to work overload and poor working conditions (WHO, 2006; Cullinan, 2006). Participants who participated in the Osborne study (2003:420) reported lack of time as a barrier to compliance with UP.

4.4.2.4 Attitudes of health care workers

The fourth theme is related to the attitudes of health care workers that influence their compliance to UP and consists of two subthemes. Attitudes can be positive or negative. Attitudes are cognitive representatives of our evaluation of ourselves, other people, things, actions, events, and ideas (Bohner & Wanke, 2002:312). “Attitude” in this study refers to factors regarding the perspectives and approaches held by the participants. These factors are difficult to measure but were evident in the words of the participants.
Table 4.12: Themes, subthemes and related issues with regard to Attitudes of health care workers

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<thead>
<tr>
<th>Themes</th>
<th>Subthemes</th>
<th>Related issues</th>
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</thead>
<tbody>
<tr>
<td>Attitudes</td>
<td>Positive attitudes</td>
<td>• You talk to the person politely</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Remind each other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Integrity</td>
</tr>
<tr>
<td></td>
<td>Negative attitudes</td>
<td>• Lack of initiative/reactive approach</td>
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<tr>
<td></td>
<td></td>
<td>• Busyness/hurry</td>
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<td></td>
<td></td>
<td>• Complacency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Power differential</td>
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<tr>
<td></td>
<td></td>
<td>• Its just carelessness, negligence</td>
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- **Positive attitudes**

In relation to Phase I where the researcher looked at compliance or asked professional nurses about compliance, the participants in this study displayed positive attitudes, with workers reminding them of compliance to UP. “So you talk to the person politely you don’t need to discipline ugly but you have to talk to that person and show him or her mistake that we are doing this like this and it end up like this” (FG3P1).

Participants in this study had positive attitudes to their work, because they mentioned that they do remind each other of universal precautions, especially in the morning in order to work effectively. “We remind each other even if the things that we tell ourselves are familiar with this but we do on weekdays before we commence our duties”(FG1P2) (Refer to 4.3.2.2.). Participants in a study conducted by Kermode (2005:31) also had a positive perception of the safety climate in their workplace.

One of the participants made an interesting point about the compliance of one of the doctors. The participant suggested that the reason this doctor complied so strictly to the hand-washing procedure, was because of his or her integrity. This is quite a powerful statement because it suggests that, in this participant’s opinion, those who do not adhere to the infection control guidelines do so partly due to some lack of integrity:

“I’ve seen one doctor err doctor, he is doing it all the time, and he has been here for a long time I think he got the integrity of it when he was doing his err first in-service in the other hospitals in Durban and then I would say again like they have said that they don’t wait or not all of them (FG2P2).”
• **Negative attitudes**

The participants pointed out that the nurses in theatre were required to wear closed boots, but that the majority of nurses in fact wore some type of clog with holes on the top. This was against the safety practices of the hospital. The participants displayed a certain amount of lack of initiative in dealing with challenges to compliance with the standards they had been trained in. In one of the quotes, the participants mentioned that they did not wear the boots that they were required to wear in theatre because the ones in stock were too big for them. The participants said that the sister-in-charge was responsible for the ordering of boots. The interviewer asked them why they simply did not order the correct sizes, implying that they should be proactive and take a logical step towards resolving the issue. The participants replied saying that they had not done this:

> Why do you order these sizes, these big sizes? *(Interviewer)*

> “I think it’s the in-charge (FG2P2)”

> Have you tried to order your sizes? *(Interviewer)*

> “No we are using the green shoes but most of the time (FG2P2)”

This quote gives evidence to the suggestion that one of the reasons for non-compliance is the attitude of the staff. In this instance, there is a display of lack of initiative. It is clear that a logical, proactive approach to this issue could have resulted in greater compliance to the wearing of the correct footwear.

A general lack of discipline and refusal to do the work as assigned to them, display a negative attitude from the health care workers. Some reasons for non-compliance with UP are actual, and some are potential, some are even personal. The assumption is that they somehow contribute, in one way or another, to the shortage of skilled health care workers in Area 3 hospitals. Negative attitudes increase the turnover in turn increasing the number of unskilled HCWs. Perception of risks influence compliance of HCWs as they mentioned that sometimes they only change shoes if there is too much blood spillage on the floor during the operation. Participants were asked how often blood spillages occurred and what happened when blood was spilled on their footwear.

The interviewer clarified that, when blood was spilled on the footwear of the staff in the theatre, they changed their clogs during the operation. One would think that the idea of
blood spilling onto one’s open clogs would be quite unpleasant and enough motivation to comply with the universal precautions. However, this participant is implying that spillage is not an uncommon experience, and merely depends on the type of procedure being conducted. It almost feels as if they are prepared to tolerate a certain amount of fluid spillage on themselves without adjusting their behaviour as indicated in the following quote:

“We don’t protect ourselves but if we have seen that there is a spillage the circulating nurse or anyone who is there will need, will remove will have to take the dirty boots and exchange yes (FG1P1”). The behaviour of professional nurses can place them at risk for blood borne infections due to non-compliance to UP guidelines (Askarian et al., 2011:193).

One of the reasons for non-compliance that was mentioned by the participants was that the theatre staff are sometimes so busy that they overlook some of the infection control procedures. An interesting point arose during discussion around the issue of hand washing. One of the participants suggested that the theatre staff were aware of infection control procedures, but neglected to do so because they were in such a hurry. This is interesting because it contradicts numerous other reports where forgetfulness was offered as a reason for non-compliance with infection control procedures. If the staff was aware of the procedures, but did not do so because of time constraints, it makes the argument of “forgetfulness” less convincing:

“They are aware, they forgot because sometimes you are rushing to prepare for the other (FG1P1) for the next case (FG1P2)”

In a study conducted by Kermode et al. (2005:31) most of the participants (75%) reported that it is not possible for HCWs to protect themselves from blood exposure in an emergency situation and 56% were too busy to protect themselves against contact with patient’s blood.

Often, when doctors are cautioned by nurses, they are not comfortable, because they feel superior to nurses. “So it’s difficult but we are trying at times when you see that it is difficult in that way we have to talk to the senior of the doctors because there is one junior in this we have to talk to the senior to look at that junior colleague” (FG3P1).
Complacency can be understood as a feeling of satisfaction with oneself while facing a potential danger or threat (English online Dictionary: 2011). The participants gave many examples of where they and other theatre staff did not adhere to certain infection control procedures properly simply due to complacency:

“And sometimes you may tell yourself that you were like 100% sterile because you were wearing the gloves so (after removing the gloves) you just throw the gloves away and continue with other things which is wrong (FG1P2)

A very interesting sub-category of “Complacency” arose in one of the excerpts. The feeling that came out of this extract was that of “laziness”:

“We are not allowed anymore to separate you discard them together with the syringe. No we just discard everything together with the needle with the syringe (FG2P3)”

This is a very interesting quote. The participants seem not to have any issue with the revised method of discarding of sharps. Previously, they were required to separate the needle from the syringe. The new guidelines stipulated that the needle and syringe should remain connected when they are discarded in order to reduce sharps injuries. This seems to be one of the only infection control procedure requirements that was met with very little resistance or complication. It is noteworthy that this revision, which requires less work and effort on the part of the staff, seemed to have had excellent adherence. The lack of compliance in other areas had been attributed to factors such as forgetfulness, busyness and time constraints. This example suggests that it may be more a case of laziness than anything else. The reasons offered for non-compliance in other areas are therefore somewhat less convincing.

The issue of forgetfulness and negligence is not very straightforward to interpret. For example, it is difficult to identify the point at which forgetfulness becomes negligence. The participants reported that there were a number of instances where infection control procedures were not adhered to due to forgetfulness and or negligence. It was interesting that one of the participants was unsure how to differentiate the two:

“Ya yes I don’t know whether he forgets or is the negligence, giggles but it does happen like when let’s say like they distract them during the procedures like the anaesthetist she or he will have to go outside and come back again then (FG1P1)”.
There were other extracts where negligence was more clearly identified as the cause for non-compliance: “It’s just carelessness, negligence, most of the time is just carelessness, just instead of putting it into the sharp box; just stick it onto the bed or pillow”. (FG3P2)

One of the issues that may contribute to the forgetfulness and negligence of staff regarding infection control procedures, is that of entering and leaving the theatre. One of the participants noted that sometimes when a medical staff member had to leave the room and return, they might have forgotten to follow some procedure or another: “Ya yes sometimes some doctors when they are busy like the anaesthetist when they are busy with the procedure they may have the err call outside, she has to go outside when she comes back she forgets to put up the, to put the protective clothing (FG1P1)”. Negative attitudes of health care workers also affect the use of UP guidelines in practice (Chan et al., 2007:1052).

One of the issues that became evident from the interviews was that there seemed to be a definite power differential between the nurses and the doctors. Some of the extracts suggested that the nurses were hesitant to approach or confront the more senior staff about their non-compliance to infection control procedures.

One of the participants said something that gave the impression that the doctors were seen as somewhat removed from the rest of the medical team.

“The problem, the problem the doctors they come, they are employed like all of us, they are shown the whole place, we only see him or her when there is an emergency Caesar (FG3P2)”

This text suggests that the doctors do not train as part of the larger team, or get involved in the activities that the nursing staff are involved in, but rather get whisked in for brief procedures where team dynamics and interaction are limited.

Additionally, there was the sense that the doctors and more senior staff did not set a good example of compliance with infection control procedures:

“I think the staff need in-service training, they are ignorant because like in the things like that the new staff because let’s say you are in theatre for the first time you see that people are, circulating nurse as you said and anaesthetic doctor and nurse as well, they are not wearing and you think that is the right thing while it is not (FG3P2)”.
This could be argued to either start or perpetuate a culture of non-compliance, because junior staff may take their cues from the doctors.

The findings of a study conducted by Chan et al. (2007:1060) reported that the compliance rate to the use of UP varied and was associated with different factors affecting the training of HCWs.

4.5 Point of interphase

According to Creswell (2003:213) the final step in the sequential explanatory mixed-method design is the interpretation of the results from both the quantitative and qualitative phases. In this study the results of phase 1 and phase 2 were analyzed together to reach a final conclusion on compliance to UP in operating theatres in Northern KwaZulu-Natal.

Question 1 was based on the findings referred to in Table 4.2.

4.5.1 Are body fluids handled with the same precautions as blood?

In all 3 hospitals that were interviewed, participants responded positively to this question, yet according to the Phase 1 results, different values were observed. Not all HCWs practice UP consistently to protect themselves from blood and body fluids, yet they are exposed to these blood borne infections. Out of all six hospitals that were observed, two hospitals did not comply with eye protection, on the use of gloves most hospitals scored high with good compliance except for one hospital that scored average. Protective clothing was used poorly in all hospitals. Most of the times the non-sterile team, meaning the circulating nurse, anaesthetic doctor and anaesthetic nurse were the ones who were not compliant to UP especially with wearing of gloves, plastic aprons and sometimes with surgical masks when they were handling these body fluids. Closed suctioning use compliance was good in five hospitals and one hospital received an average score. The correct disposal of potentially contaminated items was also well complied to in five hospitals with one hospital who obtained a very low score.

Compliance to universal precautions is still below 100% and confirms the results of the study conducted by Osborne (2003:418). The results of the quantitative data show that the majority are compliant in using protective clothing with 67% not compliant. An
explanation from qualitative data is that even though HCWs are compliant, sometimes HCWs forget to put on protective clothing; some doctors refuse to be told by nurses how to protect themselves. Poor compliance to the use of protective clothing contributes to the transmission of blood borne infections (Nophale, 2009). In focus groups, participants reported that health care workers are not able to follow UP, because of the lack of resources such as gloves, surgical masks as well as uncomfortable and unsuitable protective clothing, as indicated in the qualitative analysis.

Despite differences in professional perspectives, HCWs need to work effectively and efficiently without compromising universal precautions. 58% of participants specialised in operating theatre nursing and 50% of participants had 10 and above years experience of working in operating theatres. Only one participant had a Health Service Management qualification and was the only Operational Manager who was confident to join the group of participants. This implies that HCWs in the operating theatre are lacking managerial skills and this is a critical issue as there were so many managerial gaps identified in this study. A manager must ensure that there is enough stock in the operating theatre department and that up-to-date equipment is used. Practical supervision, monitoring of critical incidents and the evaluation of materials and products changes in IPC activities in the operating theatre and other disciplines, are the core duties of the Infection Control Practitioner (WHO, 2003: 5). One participant recounts the uncertainty when they were supposed to start using a new disinfectant. This either implies a lack of communication between management and staff, poor attention by the staff when training is conducted or lack of ensuring understanding after training. The end users of materials and supplies are involved with the selection of specific products or updated in the use of it.

In confirming this question, participants in the qualitative data-analysis reported both positive and negative attitudes of nurses. Negative attitudes between interdisciplinary workers, especially doctors and stores departments are contributing to whether HCWs complied or did not comply with UP. To avoid complacency, the key will be to focus on finding something new, motivating and interesting in the operating theatre to improve compliance to universal precautions.

The improvement of the safety climate, safety skills, safety training and safety attitudes will lead to a decrease in exposure to blood borne infections and an increase in compliance with UPs guidelines and safety practices. Compliance to universal
precautions and teamwork requires the commitment and effort of health care workers in an operating theatre to increase productivity, ensure quality performance, and participate in problem solving by communicating and cooperating with one another (Phillips, 2007:12)

Question 2 was based on the avoidance of sharps injuries as indicated in Table 4.3

### 4.5.2 Avoidance of sharps injuries

With needles not resheathed (recapped), sharps safely disposed of into containers and all sharps items safely handled; there was a high percentage of compliance for all the divisions except for one hospital that scored poor in the handling of sharp items. In this hospital, participants denied occurrences of sharps injuries. In two other hospitals participants reported sharps injuries to two doctors and nurses during the operations due to urgency, and the type of needles used during operations as explained in the findings in 4.4.2.1.

In some hospitals, the lack of in-service education was a great concern for most of the participants as well as the lack of orientation and an induction programme to newly employed health care workers and student nurses. Participants even posed a question asking who is supposed to teach doctors and who is responsible for the training of staff? Participants also complained of changes in infection control measures.

Question 3 was based on avoidance of skin or mucous membrane contamination as indicated in Table 4.4

### 4.5.3 Avoidance of skin or mucous membrane contamination

One hospital did particularly poor in hand washing.

The health care workers did not have visible cuts on their hands except for one hospital where they had two cases and they were 100% compliant. With double gloving five hospitals scored above 80% and one hospital that scored average, did not comply. Participants ignored changing torn gloves in two hospitals and obtained nil; in three hospitals that were observed in Phase 1 health care workers did not have torn gloves. Washing of hands after removing gloves is a great concern, since the highest score was 62%. All the hospitals did not comply with this aspect, and during the interviews participants said that they complied with hand washing, but as the researchers probed
participants they talked about forgetting to wash hands due to being in a hurry for preparing for operations. Other participants said they are being sterile when wearing gloves so they do not need to wash hands after the removal of gloves. A lack of knowledge in relation to the washing of hands needs urgent attention from supervisors, infection prevention and control nurses as well as management to improve compliance to hand washing. In one hospital, non-compliance to hand washing was compromised by different issues, such as nurses’ shortages, a busy schedule and structural problems, as there was no water supply. A lack of time was also a great concern as professional nurses reported that they had to rush to prepare for the next operation with a shortage of nurses.

Question 4 was about the handling of blood and body fluids spillage on skin as indicated in Table 4.4.

4.5.4 Handling of blood and body fluids spillage on skin

Compliance with the wearing of plastic aprons and plastic boots was not good in most of the hospitals. The highest score was 63.16% and other hospitals were even worse.

In the handling of blood and body fluids to prevent spillage on the skin, HCWs were expected to wear protective clothing. The wearing of gloves was non-compliant since the highest score was 73%. Eye protection use was also poor, two hospitals did not use eye protection altogether and the highest score was 67% in all the hospitals. Participants were not complying with the wearing of plastic aprons, wiping of spills with paper was also poor, because in most hospitals nurses were using dressing towels for wiping spillages on the floor. With the use of a disinfectant, the highest score was 48%, and correct strength of disinfectant used and the time it was used on the spillage scored badly as well, except for one hospital where the score was 85.71%. In most of the hospitals the compliance with the handling of blood and body fluids was very bad and the availability of resources was also a concern.

During focus group interviews participants admitted that they do not protect themselves and they also said that they change their shoes during the operation when there is a spillage on the floor. Most participants reported discomfort, sweating and do not like the aprons and the same complaints were raised with the wearing of plastic boots where participants reported fungal infections, discomfort and big sizes.
A lack of discipline on the side of the health care workers and management was observed, since protective clothing was available but was sometimes not ordered from stores accordingly. Communication with the stores department was poor following several meetings that were held, and when ordered, stores often deliver the incorrect equipment and supplies. There appears to be an obvious lack of clarity regarding who is responsible for what. A lack of reporting lines was also identified.

Sometimes they ran out of supplies in the whole hospital and stores department had to borrow from other hospitals. The arrival of new equipment was also not communicated and demonstrated, and new changes were implemented without prior training of the concerned end users. Managers must be reminded to order the correct equipment.

Some factors influencing the compliance to UP by health care workers include a lack of adequate resources and motivation, understanding and improper behaviour (Askarian et al., 2006:595). Health care workers are at high risk of occupational exposure to blood borne infections.

Question 5 was about spray or aerosol precautions and decontamination of blood and other body fluids as indicated in Table 4.5

### 4.5.5 Spray/ Aerosol precautions and decontamination of blood and other body fluids

The hospitals had poor compliance with face or eye protection; the hospitals had partial compliance and non-compliance, hospital A obtained 68.97% being the highest score.

In most of the hospitals, items were not applicable, such as decontamination of blood and other body fluids on skin, mouth and eyes as well as skin puncture. The results of Phase 1 showed that the use of eye and face protection was non-compliant. A skin puncture was experienced in one hospital and scored average.

Participants complained about a lack of supplies, and unsuitable materials as the reason for non-compliance. The visors caused mist when breathing and then the health care workers cannot see, especially the doctors. Participants also raised the problem of sweating when using these visors, but the goggles do not cover the most part of the face. Health care workers do not get an adequate supply of goggles and surgical face masks were also out of stock from some stores.
Question six was about cleaning/ disinfection/ sterilizing of equipment as indicated in Table 4.6

4.5.6 Use of cleaning/ disinfection/ sterilizing of equipment

It seems that the most of the participants in three different hospitals complied to cleaning, disinfection, and sterilizing, except for hospital A, B, and C where participants were observed to have no knowledge of the correct strength of disinfection.

Most hospitals complied with the use of sterile equipment, the cleaning and disinfection of trolleys and the correct type of sterilizer and disinfectant used. With the cleaning of the operating room all hospitals complied, except the one where there was no water supply on the day of observations. The correct use of disinfectants in four hospitals was good, especially with the damp dusting of operating rooms and in between operations, but using the correct strength of the disinfectant was worrying, because in most cases it was not done correctly. The implication of this finding is that the improper cleaning and disinfection of equipment and the environment could result in the transmission of blood borne infections.

4.6 Conclusion

The above results of compliance to UP support the findings of previous studies that reported a less than 100% compliance rate with universal precautions. A range of compliance rates has been reported in the literature using different methods of research and recommendations were implemented in this study by using a mixed-method research design to collect valuable information. The findings of both Phase 1 and Phase 2 were discussed in detail. In the last chapter the conclusions, limitations and recommendations will be discussed.
5.1 Introduction

In the previous chapters the researcher discussed the overview of the research in chapter one, literature review on Universal Precautions in chapter two, research design and methods in chapter three, and findings and discussion in chapter four. The conclusions, limitations and recommendations are discussed in this last chapter. The aim of the study was to investigate compliance with Universal Precautions in operating theatres in Northern KwaZulu-Natal to contribute to strategies to enhance compliance to UP, thus limiting the risk of infection to patients and health care workers.

5.2 Conclusions

In framing the conclusions, attention was devoted to the objectives of the study.

5.2.1 OBJECTIVE 1

The first research objective to explore and describe the practices regarding compliance with Universal Precautions in selected operating theatres in Northern KwaZulu-Natal was addressed in Phase 1.

Based on the findings of the study it can be concluded that HCWs are not complying with UPs. The study findings of observations of HCWs established that compliance with UPs in operating theatres is less than 100%. The conclusion regarding the compliance to the types of universal precautions are discussed below.

It was apparent from this study that handling of body fluids with the same precautions as blood is still a big problem facing Area 3 hospitals. The use of gloves scored 70% while wearing of eye protection was only 40.47%, and in two hospitals eye protection was not used at all during operation. With regard to wearing of protective clothing when handling body fluids was only 36%.
Compliance was good in most of the hospitals with regard to correct disposal of potentially contaminated items. In avoidance of sharps injuries and handling of sharp objects, compliance was very good except for two hospitals where the lowest hospital received nil, with only partial compliance to all sharps items safely handled. Most of the times the non-sterile team, meaning the circulating nurse, anaesthetic doctor and anaesthetic nurse were the ones who were not compliant with UPs. The above mentioned health care workers were not wearing gloves when handling sharps and sometimes recapping sharps.

Compliance with use of disinfectant when handling blood and body fluids spillages was also poor in most of the hospitals. In most of the time the cleaners were not supervised by professional nurses when carrying out this procedure, and sometimes the nurses themselves used dressing towels for wiping spillages of blood and body fluids on the floor instead of using paper towels. All hospitals complied with the use of sterile equipment.

Because health care workers are not complying with UPs, both HCWs and patients are at risk of acquiring these blood borne infections.

5.2.2 OBJECTIVE 2

The second research objective to explore and describe the perceptions of registered nurses working in operating theatres in Northern KwaZulu-Natal regarding factors influencing compliance with Universal Precautions was addressed in Phase 2.

From the results of Phase 2, it is obvious that there are various factors influencing compliance with universal precautions in operating theatres. Registered nurses are trained in operating theatre courses, but adherence to the implementation of universal precautions is still a problem in operating theatres. Factors such as a lack of in-service training, changes in Infection Prevention and Control practices that are not communicated to HCWs were reported as contributing to non-compliance. According to the participants during the focus groups, another factor for non-compliance was with protective clothing that was made from unsuitable and uncomfortable materials which cause sweating and discomfort during operations. The HCWs are exposing themselves to blood borne infections by not consistently wearing visors protecting their eyes, apparently because it is uncomfortable and causes sweating.
Communication between nurses was reported to be good. However interdisciplinary communication between nurses and doctors as well as between nurses and stores people was another contributing factor to non-compliance with UP. Registered nurses as participants in this study raised concerns about orientation of doctors which is conducted by nurses in operating theatres on the use of universal precautions and participants in this study also reported that doctors don’t want to be cautioned by nurses. The staff at the stores department often supply expired items to the operating theatre which is a hazard to patients. They also do not consider the ordering preferences of the registered nurses when placing the orders.

Participants in this study also perceived limited managerial skills as activities contributing to non-compliance to UP. Operational managers should be able to plan and execute educational opportunities and ensure good communication with all role players. Another factor reported in this study was shortages of health care workers such as doctors. If there is a shortage of registered nurses ‘shortcuts’ are often used and universal precautions are not adhered to.

Negative attitudes were also prominent from the findings of this study as a hindrance to compliance with UPs. ‘Lack of time’ and forgetfulness to do hand washing was reported by most participants as a factor to compliance with UP. This imply them not considering complying with universal precautions as important.

5.3 Limitations

There were several limitations to the study. In two district hospitals, the researcher could not get cases for observations as planned due to a shortage of doctors. Patients who needed abdominal surgical interventions were transferred to other hospitals except for emergencies.

Only the perceptions of professional nurses were explored regarding factors influencing compliance to universal precautions. These perceptions were collected during the focus groups. Other health care workers could have provided different perspectives.

The original idea was to use the Health Belief Model as conceptual framework for the analysis of the data from the focus groups, but eventually the data from the focus groups, did not relate to the HBM.
5.4 Recommendations

5.4.1 Practice

- To put reminders in all strategic areas inside the operating theatre, for example in scrub rooms, to remind HCWs of the washing of hands and other universal precautions.
- On the part of management, support is needed on the issuing of correct and suitable equipment including protective clothing, provision of infrastructure like water supply and proper air conditioning system to minimise the risk of infection.
- To appoint an Infection Prevention and Control team in all hospitals that will comprise of a clinician to provide medical input and ICP to avail her-/himself and conduct surveys and audits for example regarding hand scrubbing in operating theatres.
- To improve communication skills between doctors and nurses inside the operating theatre by holding regular operating theatre users’ meetings and keeping records.

5.4.2 Education

- From the findings it appears that there is a lack of knowledge and negative attitudes. There is an urgent need to review the curricula for the basic and post basic courses in order to empower health care workers with needed competencies.
- The orientation and induction programmes for all health care workers need to be improved on employment of new employees especially for doctors.
- Ongoing training of all health care workers on Infection Prevention and Control issues, including basic principles of universal precautions.
- Further training regarding UP and IPC among medical students and student nurses need urgent attention.
- An assessment tool must be developed and implementation facilitated by the Infection Prevention and Control practitioner as a method of evaluating compliance in operating theatres.
5.4.3 Research

More research is needed on universal precautions to see if these factors are also applicable to other institutions. The study of the perceptions of doctors regarding compliance to UP should also be performed. An intervention study to evaluate the use of reminders and other practice recommendations are effective to increase compliance to UP and decrease blood borne infections.

5.5 Conclusion

The objectives set in chapter 1 (1.4) were reached because gaps were identified in Phase 1 during observations of practices. Phase 2 was based on the findings of Phase 1 where the factors influencing compliance with UP were explored.

In conclusion, from the findings in chapter 4 it is clear that health care workers are at high risk of acquiring blood borne infections because they do not comply with universal precautions. Several factors contribute to non-compliance with universal precautions.

The conclusion of this study can contribute to strategies to limit infection caused by blood borne infections in Kwa-Zulu Natal and the rest of South Africa.
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Appendix A Ethics approval from NWU Ethics Committee

ETHICS APPROVAL OF PROJECT

This is to certify that the next project was approved by the NWU Ethics Committee:

<table>
<thead>
<tr>
<th>Project title: Strategies to enhance compliance to universal precautions against blood borne infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project leader: Dr. K Minnie</td>
</tr>
<tr>
<td>Student working on project: Z.E. Masinga</td>
</tr>
<tr>
<td>Project title of student Masinga:</td>
</tr>
<tr>
<td>Compliance to Universal Precautions in Northern Kwa-Zulu Natal Operating Theatres.</td>
</tr>
<tr>
<td>Ethics number: NWU-00034-10-A1</td>
</tr>
<tr>
<td>Expiry date: 2015/06/30</td>
</tr>
</tbody>
</table>

The Ethics Committee would like to remain at your service as scientist and researcher, and wishes you well with your project. Please do not hesitate to contact the Ethics Committee for any further enquiries or requests for assistance.

The formal Ethics approval certificate will be sent to you as soon as possible.

Yours sincerely

Me. Mariëtte Haigry
NWU Ethics Secratariate
Appendix B Approval letter from DOH KwaZulu-Natal

Health Research & Knowledge Management sub-component
10 – 103 Natalia Building, 330 Langalibalele Street
Private Bag x9051
Pietermaritzburg
3200
Tel.: 033 – 3953189
Fax.: 033 – 394 3782
Email: hrkm@kznhealth.gov.za
www.kznhealth.gov.za

Reference: HRKM 144/10
Enquiries: Mr X. Xaba
Telephone: 033-395 2805

Dear Mrs Z. Massinga

Subject: Approval of a Research Proposal

1. The research proposal titled ‘Compliance to universal precautions in northern KwaZulu Natal operating theatres’ was reviewed by the KwaZulu-Natal Department of Health. The proposal is hereby approved for research to be undertaken at Nkonjoni, Caza, Nkandla, Mbongolwane, Lower Umfolozi, Bethesda and Mecvold hospitals.

2. You are requested to take note of the following:
   a. Make the necessary arrangement with the identified facility before commencing with your research project.
   b. Provide an interim progress report and final report (electronic and hard copies) when your research is complete.

3. Your final report must be posted to HEALTH RESEARCH AND KNOWLEDGE MANAGEMENT, 10-102, PRIVATE BAG X9051, PIETERMARITZBURG, 3200 and e-mail an electronic copy to hrkm@kznhealth.gov.za

For any additional information please contact Mr X. Xaba.

Yours Sincerely

Chairperson: Provincial Health Research Committee
KwaZulu-Natal Department of Health
Date: 12/10/2010
MEMORANDUM

TO : Mrs. Z. E. Masinga
FROM : District Manager
DATE : 22.02.2010
RE : REQUEST TO CONDUCT RESEARCH IN THE DISTRICT

Your correspondence dated 01.02.2010 refers

The Zululand District Office has no objection to your request but you can only conduct the research once approval from Head Office has been obtained. I believe that this project will be successful and will benefit the Department and other stakeholders.

I apologise for the delay to respond and the inconvenience it might have caused.

Thank you

DISTRICT MANAGER
MEMORANDUM

No2 Lood Avenue, Cnr Chrome & Crescent Avenue Empangeni Rail
Private Bag X 20034, Empangeni, 3880
Tel.: 035 7870631/3/4/5/6/7/8/9, Fax: 035 7870644/0865176012
Email: Nokuthula.Nyawo@kznhealth.gov.za
www.kznhealth.co.za

HEALTH
KwaZulu-Natal

OFFICE OF THE DISTRICT MANAGER

TO : MRS ZANELE MASINGA
CC :
Fax :

FROM : MR MM ZUNGU
DISTRICT MANAGER

DATE : 5 July 2010
SUBJECT : REQUEST TO CONDUCT RESEARCH

1. Your request to conduct research on “compliance to Universal Precautions in Northern KwaZulu-Natal Operating Theatres” at LUDWMH, Nkandla & Mbongolwane Hospitals refers.
2. You are advised that the request is approved on the following conditions:
   - That you observe the standard ethical considerations including the following:
     - Participants rights to participate
     - Observing confidentiality and anonymity
     - Informed consent obtainance prior to research from your research subjects/ participants
     - Feedback and dissemination of results, also to the office of the District Manager.
   - The approval is only for the above mentioned research only.
   - That you present this approval letter and you research proposal to the head of the institution where research will be conducted.

3. The department reserves the right to withdraw this approval should any ethical considerations listed above be breached. Furthermore any disclosure of findings to the media (print/electronic media) or political forums will have to be sanctioned by the Department of Health KZN – Head of Department.

May I wish you success with your studies and look forward to interacting with the findings of your dissertation report.

Thank you

MR MM ZUNGU
DISTRICT MANAGER
UTHUNGULU

uMnyango Wezempilo. Departement van Gesondheid

Fighting Disease, Fighting Poverty, Giving Hope
Dear Zanele Massinga

I have pleasure in informing you that permission has been granted to you by the District Office to conduct research on in this district entitled:

COMPLIANCE TO UNIVERSAL PRECAUTIONS IN NORTHERN KWA-ZULU NATAL OPERATING THEATRES.

Please note the following:

1. Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Department of Health with regards to this research.
2. This research will only commence once this office has received confirmation from the Provincial Health Research Committee in the KZN Department of Health.
3. Please ensure this office is informed before you commence your research.
4. The District Office will not provide any resources for this research.
5. You will be expected to provide feedback on your findings to the District Office.

Sincerely,

C H Vaughan Williams
Family Physician, Umkhanyakude Health District Office

Umkhanyakude Health District Office
Dr C H Vaughan Williams
Medical Manager, Senior
Private Bag X 026, Jozini 3967
Tel: 035 5721327, Fax: 035 5721251
Cell: 072 584 3472
Email: hervey.williams@kznhealth.gov.za

Reference:
Enquiries: Dr CH Vaughan Williams
Telephone: 035-5721327 Ext 114

13 July 2010
Appendix D1 Permission letter Benedictine Hospital

BENEDICTINE HOSPITAL
Vryheid Main Road, Nongoma, 3950
Private Bag X5007, Nongoma, 3950
Tel: 035 – 831 7151
Fax: 035 – 8310 740
E-mail: goria.shamase@kznhealth.gov.za

ENQ: Mrs G.T Shamase

Z.E. MASSINGA
BENEDICTINE HOSPITAL
PRIVATE BAG X 5007
NONGOMA
3950

DEAR MADAM

RE: PILOT STUDY REQUEST

PROJECT TITLE: - COMPLIANCE TO UNIVERSAL OPERATIONS IN THE NORTHERN KWAZULU NATAL OPERATING THEATRES.

You have been granted the permission to conduct a pilot study at Benedictine hospital.

Thank you

[Signature]

CHIEF EXECUTIVE OFFICER
BENEDICTINE HOSPITAL

DEPARTMENT OF HEALTH
BENEDICTINE HOSPITAL
2010 -11- 0 3
P/BAG X 5007
NONGOMA 3950

uMnyango Wiezempilo . Departement van Gesondheid
Fighting Disease, Fighting Poverty, Giving Hope
Appendix D2 Permission letter- Nkandla Hospital

NKANDLA HOSPITAL
Mtotsha lane, Nkandla 3855
Private Bag x 102, Nkandla 3835
Tel: 035 – 8330283 (direct telephone line)
Fax: 035 – 8330054
E-mail: nibuso.mntambo@kznhealth.gov.za
www.kznhealth.gov.za

Date: 02/10/2010

ATTENTION: MS Z. MASINGA

REQUEST TO CONDUCT A STUDY

Approval is hereby granted for you to conduct the study “Compliance to universal precautions in Northern KwaZulu-Natal Theatres” in Nkandla hospital.

Please note that participation in the study by employees is free and voluntary. We trust that you will make necessary arrangements for data collection in advance.

Yours sincerely

[Signature]

MR M. MNTAMBO
HOSPITAL CEO

“Fighting Disease, Fighting Poverty, Giving Hope / Sibwe Nzifiso, Sibwe Nobuhha, Sinika Ithemba”
Appendix D3 Permission letter- LUDWM Hospital

LOWER UMFOLOZI DISTRICT WAR MEM. HOSP.
Postal Address: Private Bag X20005 EMPANGENI
Physical Address: 29 Union Street
Tel.: 035 9077001, Fax: 035 7925801
Email: cebo.myeza@kznhealth.gov.za
www.kznhealth.gov.za

2010/10/25

Miss ZE Massinga
P.O Box 1672
EMPANGENI
3880

Madam

APPLICATION TO DO RESEARCH IN THEATRE
This is to inform you that your application to conduct research in our facility has been approved. For more information, please liaise with Mrs Pewa the Nurse Manager at 035 9077005.

[Signature]
HOSPITAL CEO

uMnyango Wezempilo. Departement van Gesondheid
Fighting Disease, Fighting Poverty, Giving Hope
Appendix D4 Permission letter- Nkonjeni Hospital

BENEDICTINE HOSPITAL
PRIVATE BAG X 5507
NONGOMA

Attention: Mrs Z.E Masinga

YOUR REQUEST TO CONDUCT RESEARCH AT NKONJENI HOSPITAL, DATED 25 OCTOBER 2010 REFERS.

Management hereby approves your request and believes that it will benefit not only the hospital as a patient but the entire department.

Kind regards

Mrs D.J Linda
HOSPITAL CEO
NKONJENI DISTRICT
TO: NURSING SERVICE MANAGER-BENEDICTINE HOSPITAL 
ATTENTION: MS.Z.E.MASINGA-ANM 
FROM: CHIEF EXECUTIVE OFFICER-BETHESDA HOSPITAL 
DATE: 2010/12/08 
RE: PERMISSION TO CONDUCT RESEARCH AT BETHESDA HOSPITAL

Dear Zanele,

Kindly be advised that the management of this hospital has no objection to your prose research, it is however a wish that the research result be shared with the hospital for its quality improvement initiatives.

Thank you,

[Signature]

Chief Executive Officer

UNNYANGO WEZEMPILIO
KWIFUNDAZWE SAKNANZULU NATAL
BETHESDA HOSPITAL
08 DEC 2010
PRIVATE BAG X502
UBOMBO, 3970
PROVINCE OF KWAZULU NATAL
DEPT. OF HEALTH

uMnyango Wezempilo. Departement van Gesondheid
Fighting Disease, Fighting Poverty, Giving Hope
Appendix D6 Permission letter- Mosvold Hospital

MOSVOLD HOSPITAL
Postal Address: Private Bag x2211, Ingwavuma 3968
Physical Address: Ingwavuma Main Road
Tel.: 035 – 5910122 Fax: 035- 5190148/ 035 – 5910039
E-mail: vusi.vilakazi@kznhealth.gov.za
www.kznhealth.gov.za

Reference: Permission for research
Enquiries: Mr. SV Vilakazi
Telephone: (035) 591 0122 x104
Date: 03/12/2010

To: Ms Z Massinga

RE: COMPLIANCE TO UNIVERSAL PRECAUTIONS IN NORTHERN KWAZULU NATAL OPERATING THEATRES

I have pleasure in informing you that permission has been granted to you by Mosvold Hospital-Department of Health to conduct research on Compliance to universal precautions in Northern kwaZulu Natal operating theatres.

Please note the following:

1. Please ensure that you adhere to all the policies, procedures, protocols and guidelines of the Department of Health with regards to this research.

2. This research will only commence once this office has received confirmation from the Provincial Health Research Committee in the KZN Department of Health.

3. Please ensure this office is informed before you commence your research.

4. The Mosvold Hospital-Department of Health will not provide any resources for this research.

5. You will be expected to provide feedback on your findings to the Mosvold Hospital-Department of Health.

Thank you.
Yours faithfully

Mr. S.V. Vilakazi
Hospital Manager – Mosvold Hospital

UMnyango Wezempilo. Departement van Gesondheid
Fighting Disease, Fighting Poverty, Giving Hope
### ZULULAND DISTRICT

<table>
<thead>
<tr>
<th>HOSPITAL</th>
<th>NO. OF STAFF IN O.T.</th>
<th>NO. OF OPERATING ROOMS</th>
<th>AVERAGE NO. OF ABDOMINAL OPERATIONS</th>
<th>ELECTIVE DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (VRYHEID)</td>
<td>14</td>
<td>3</td>
<td>Per month -107</td>
<td>Obstetrics everyday Surgery –Tuesdays &amp; Wednesdays</td>
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<td></td>
<td></td>
<td></td>
<td>Per week -27</td>
<td></td>
</tr>
<tr>
<td>B (ITSHELEJUBA)</td>
<td>13</td>
<td>2</td>
<td>Per month -23</td>
<td>Wednesdays</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Per week -6</td>
<td></td>
</tr>
<tr>
<td>C (NKONJENI)</td>
<td>19</td>
<td>2</td>
<td>Per month -52</td>
<td>No elective day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Per week -13</td>
<td></td>
</tr>
<tr>
<td>D (CEZA)</td>
<td>13</td>
<td>2</td>
<td>Per month -14</td>
<td>No elective day</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>Per week - 4</td>
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### UMKHANYAKUDE DISTRICT

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<tr>
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<th>NO. OF OPERATING ROOMS</th>
<th>AVERAGE NO. OF ABDOMINAL OPERATIONS</th>
<th>ELECTIVE DAYS</th>
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</thead>
<tbody>
<tr>
<td>E (HLABISA)</td>
<td>11</td>
<td>2</td>
<td>Per month - 62</td>
<td>No elective day</td>
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<td></td>
<td></td>
<td></td>
<td>Per week - 16</td>
<td></td>
</tr>
<tr>
<td>F (MSELENI)</td>
<td>11</td>
<td>2</td>
<td>Per month - 40</td>
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<td></td>
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<td></td>
<td>Per week - 10</td>
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</tr>
<tr>
<td>G (MANGUZI)</td>
<td>20</td>
<td>3</td>
<td>Per month - 54</td>
<td>No elective day</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Per week - 14</td>
<td></td>
</tr>
<tr>
<td>H (MOSVOLD)</td>
<td>20</td>
<td>2</td>
<td>Per month - 109</td>
<td>Monday - Friday</td>
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<td></td>
<td></td>
<td></td>
<td>Per week - 27</td>
<td></td>
</tr>
<tr>
<td>I (BETHESDER)</td>
<td>8</td>
<td>2</td>
<td>Per month -32</td>
<td>Surgery – Wednesday,</td>
</tr>
<tr>
<td>District</td>
<td>Name</td>
<td>Consultations</td>
<td>Per month</td>
<td>Elective Days</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------</td>
<td>---------------</td>
<td>------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>J (CATHERINE BOOTH)</td>
<td>9</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Per week -2</td>
</tr>
<tr>
<td></td>
<td>K (MBONGLWANE)</td>
<td>10</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Per week -3</td>
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<td></td>
<td>L (NKANDLA)</td>
<td>15</td>
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<td>Per week -6</td>
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<td></td>
<td>M (EKHOMBE)</td>
<td>6</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Per week -3</td>
</tr>
<tr>
<td></td>
<td>N (ESHOWE)</td>
<td>24</td>
<td>4</td>
<td>173</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Per week -43</td>
</tr>
<tr>
<td></td>
<td>O (MAGWAZA)</td>
<td>13</td>
<td>1</td>
<td>19</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>Per week -5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Name</th>
<th>Consultations</th>
<th>Per month</th>
<th>Procedures</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>P (LUDWM)</td>
<td>22</td>
<td>3</td>
<td>389</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Per week -97</td>
</tr>
<tr>
<td></td>
<td>Q (NGWELEZANE)</td>
<td>47</td>
<td>6</td>
<td>212</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Per week -53</td>
</tr>
</tbody>
</table>
Appendix F

DATA COLLECTING TOOLS

OBSERVATIONAL CHECKLIST: BASIC ELEMENTS OF UNIVERSAL PRECAUTIONS

Adapted from Committee for Science and Education, MASA (1995: 382).

P – Partially done
N – Not done
D - Done
NA – Not applicable

<table>
<thead>
<tr>
<th></th>
<th>Surgeon</th>
<th>Assistant Surgeon</th>
<th>Scrub nurse</th>
<th>Circulating nurse</th>
<th>Anaesthetic Doctor</th>
<th>Anaesthetic nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Body fluids handled with same precautions as blood.</td>
<td>Gloves used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Eye protection used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Protective clothing used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Closed suctioning used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potentially contaminated items correctly disposed of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REMARKS:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. Avoidance of sharps injuries

<table>
<thead>
<tr>
<th>Description</th>
<th>Surgeon</th>
<th>Assistant Surgeon</th>
<th>Scrub nurse</th>
<th>Circulating nurse</th>
<th>Anaesthetic Doctor</th>
<th>Anaesthetic nurse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needles not re-sheathed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sharps safely disposed of into container</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All sharp items safely handled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**REMARKS:**

---

3. Avoidance of skin or mucous membrane contamination

3.1 Hand protection

- Cuts covered/ dressed
- Skin rash covered
- Double gloving if indicated

---

119
| 3.2 Blood/ Body fluids spillage on skin | Gloves worn |
|                                        | Eye protection worn |
|                                        | Plastic apron worn |
|                                        | Spills wiped with paper |
|                                        | Disinfectant used |
|                                        | Correct disinfectant, strength & time used |
| 3.3 Spray/ Aerosol Precautions         | Face/ Eye protection used |
|                                        | Suction smoke/ aspirate laser |
| 3.4 Decontamination of blood & other body fluids | Skin washed with correct soap & water |
|                                        | Mouth & eyes washed copiously with water |
|                                        | Skin puncture allowed to bleed |

REMARKS:
<table>
<thead>
<tr>
<th>4. Cleaning/ Disinfecting/ Sterilizing</th>
<th>Surgeon D/P/N</th>
<th>Ass. Surgeon D/P/N</th>
<th>Scrub nurse D/P/N</th>
<th>Circulating nurse D/P/N</th>
<th>Anaesthetic Doctor D/P/N</th>
<th>Anaesthetic nurse D/P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Preparation of operating room</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Equipment sterile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trolley cleaned/ Disinfected</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O. R. Clean/ Damp dusted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.2 Disinfectant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct type of sterilizer/ disinfectant used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disinfectant correctly used</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct strength</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3 Handling of equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gloves worn when handling equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apron worn</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.4 Handling of linen</td>
<td>Correct scrubbing, gowning, donning of gloves</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Correct use of materials</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Materials sluiced before laundering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Soiled linen discarded in appropriate plastic bags &amp; bins</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Correct colour coding of plastic bags</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4.5 Body fluids spillage</th>
<th>Wipe spills with paper</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Discard paper in red plastic bag</td>
</tr>
<tr>
<td></td>
<td>Use disinfectant over the area</td>
</tr>
<tr>
<td></td>
<td>Correct time for area disinfected</td>
</tr>
</tbody>
</table>

**Remarks:**
Appendix G

STANDARD OPERATING PROCEDURES FOR DATA-COLLECTION

STRATEGIES TO ENHANCE COMPLIANCE TO UNIVERSAL PRECAUTIONS AGAINST BLOOD BORNE INFECTIONS

**Project Title:** COMPLIANCE TO UNIVERSAL PRECAUTIONS IN

NORTHERN KWAZULU NATAL OPERATING THEATRES

CONTACT DETAILS:

Z.E. MASSINGA: 035 831 7014 (office)

082 367 3379 (cell)

KARIN MINNIE: 018 299 1836 (office)

SEBI LEKALAKALA-MOKGELE: 012 521 3017 (office)

**PLANNING**

**BEFORE DATA COLLECTION:**

Prepare for facility visit: By Project Researcher
• communicate with Nursing Managers of each facility to plan for data collection
• determine location of and the distances between hospitals to be able to plan visit schedules
• check for slate days and plan data collecting days accordingly
• confirm the date for data collection
• **at least one week before the visit**, contact the Nursing manager to remind about the planned visit
• inform the Assistant Nursing manager of the operating theatre as well
• organise transport and accommodation for the researcher and research facilitator
• prepare files with adequate supplies of data collection (data collecting tools)
• collect all permission letters (DoH permission letter, DM permission letter, Institutional permission letter and NWU approval letter)

**DATA COLLECTION**

**Institutional visit:**

**Team Leader to:**

• Ensure you have data collecting tools, notebook and permission letters.
• **On Arrival at the institution:**

The team leader to:

• meet the Nursing manager, ANM and Operating theatre Operational manager
• introduce themselves and explain the purpose of the visit
• explain you are conducting research on Universal precautions in the operating theatres in Area 3

• brief the ANM and OM of the Operating Theatres about the 2 key activities of data collection (observation & focus group discussion)

• the Area manager, district and hospital management are aware and have approved of the research as findings will help identify strengths and weaknesses
• this will lead to development of interventions and strategies to enhance compliance to universal precautions in Area 3
• the hospitals to be visited represent all hospitals in Area 3
• during the first part, observations of the practices will be undertaken in the operating theatre
• all the health care workers who will be in the operating theatre on the day will be observed
• all patients coming for the abdominal operations will be requested to give informed consent
• Informed consent will be obtained from all staff on duty (research participants) in theatre
• the researchers will be non-participants
• 3-4 abdominal operations will be observed in one day
• researcher will complete a checklist
• no patient information will be recorded
• HCWs names will not appear on the report
• report will be available to all hospitals, and district managers in Area 3

In Operating theatre

• Researchers will introduce themselves to operating theatre health care workers and patients
• change to operating attire and observe HCWs for complete wearing of theatre attire-cross-over/pants and tops, head cover, shoe cover/ shoes
• quick orientation to operating theatre environment especially operating rooms

❖ Observe & complete Page 1 of the checklist:

• Identify checklist- operation 1 and the hospital
• observe preparation of theatre rooms, scrub rooms, set room and waiting area/ reception of patients
• observe patients attire for correct preparation of patients- must be on operating attire
• observe transportation of patients to operating room, OT bed
• observe for sterility of sets- tape colour changed, date of sterilisation and set is dry
• observe for wearing of face mask, eye protection, long apron worn
• observe for scrubbing, wearing of gown, donning of gloves, sterile gloves not torn and for any contamination and any open wounds, are covered/dressed with water repellent dressing, any skin rash (the whole surgical team)
• opening of sterile sets not contaminated by scrub sister, sterile field created
• skin preparation, correct site confirmed & cleaned with antiseptic agent immediately before draping, not going backwards over the already prepped area
• draping of the patient with sterile barrier to create and maintain an adequate sterile field closed suctioning used, suction connected

• Complete Page 2 of the checklist:

➢ Sharps:

• counting of all instruments, sharps and swabs before starting the operation by scrub sister and circulating nurse
• recording on the board all counted instruments, sharps and swabs
• the blade is attached and detached to the handle using a needle holder (never using the fingers)
• needles not re-sheathed after use
• all sharps and cutting instruments placed in a container on a sterile trolley
• sharps handed to the surgeon in a receiver
• all sharps, blades and scalpels handled and disposed properly into a sharps container

➤ Skin and mucous membrane

• cuts and skin rash covered
• gloves worn and double gloving
• torn gloves changed and removed from sterile field immediately
• eye protection, plastic apron worn and correct colour
• spillage wiped with paper, disinfected with correct disinfectant and correct time over the area
• discard paper in a red plastic bag
• smoke suctioned when using diathermy
• hands washed after removing gloves with correct soap and water
• mouth and eyes washed copiously with running water in cases of spillage

➤ Cleaning/ Disinfection/ Sterilizing

• discard instruments accordingly
• discard contaminated and soiled linen in a correct plastic bags and bins
• correct colour coding
• gloves used during operation changed
• instruments washed using a disinfectant, sharp equipment protected (washed separately)
• materials sluiced before laundering, correct disinfectant used
• Sharp instruments protected before sterilising
• Operating room cleaned, damp dusted before next operation, floors mopped
• Trolleys cleaned and disinfected before preparing for the next case

Face masks changed after each operation
Appendix H

PARTICIPANT INFORMATION SHEET AND CONSENT FORM

Dear participant

I am a Masters student of the Potchefstroom-campus of the North-West University. You are invited to participate in a research study regarding infection in operating theatres in Kwa-Zulu Natal.

The Nature and purpose of the study

The purpose of this study is to provide evidence to be used in the development of strategies to limit the risk for infections. You are asked to participate in the phase of the study that entails observation of practices during major elective abdominal surgery and focus group interviews.

During the observation the operation will continue as usual, while the researcher and facilitator will observe and record all relevant occurrences.

The second phase entails focus group discussions. Please understand that your participation is voluntary and you are not being forced to take part in this study. The choice of whether to participate or not, is yours alone. However, we would really appreciate it if you do share your thoughts with us. If you agree to participate, you may stop me at anytime and tell me that you don’t want to go on with the interview; this will not result in any negative consequences for you.

If you agree to participate in this study, a researcher will arrange to interview you at a time and a place convenient for you. The researcher will ask you questions about your opinions and experiences of the project. The interview will take approximately an hour and a half (90 minutes). With your permission the interview will be audio-recorded.

Approval to do research

The protocol of this study was submitted to the Ethics committee of the Faculty of Health Science of the Potchefstroom Campus of the North-West University and approval has been granted. The provincial authorities, district managers and the hospital management are also aware of this research being done in this hospital.
Risk or discomfort involved.

A trained researcher and facilitator will observe the practices during operations. They will be as undistruptive as possible during the operation will only deviate from their role as un obstructive observer to intervene if actions that put the patient under increased risk are observed. All patients coming for the abdominal operations and all health care workers who will be in the operating theatre on the day will be requested to give informed consents. No patient information will be recorded and health care workers names will not appear on the report.

During the second phase, if particular questions make you feel uncomfortable you may refuse to respond to any particular question and you may stop the interview at any time, without any fear of any negative consequences for you.

Confidentiality

Any personal information that may become known to the researcher will be kept strictly confidential. The results of the research will be published or presented in such a fashion that all participants will remain unidentifiable

Possible benefits of this research

Your contribution in this research project regarding compliance to universal precautions will contribute to the development of strategies to limit the risk of infection. These guidelines may be to the benefit of patients, health care workers as well as the community as a whole. You will not be paid to participate in this study. There may be no direct benefit to you from participating in this study. However, the information gained from this study may provide information for developing interventions and strategies to enhance compliance to universal precautions.

Right to withdraw data

More detailed information about the study will follow as soon as practicable. You have the opportunity to request that data collected while you were not fully informed must be withdrawn. Your participation in this research is entirely voluntary and you will not be discriminated against if you prefer to withdrawn data related to your actions.

Information

You are welcome to indicate on the attached document if you would like to receive a report of the study after it has been completed.

Thank you

Ms Zanele Massinga

M Cur student
Appendix I- informed Consent Form

CONSENT TO PARTICIPATE IN THE STUDY

I have read the above information before signing this consent form. The content and meaning of the information is clear to me. I have been given opportunity to ask questions. I understand that if I do not participate it will not be to my disadvantage. I hereby volunteer to take part in this study.

--------------------------------------  ---------------------------------------
Participant’s signature              Person obtaining informed consent

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Witness                   Date
Appendix J- Additional information sheet

Additional information regarding Research on prevention of infection

Due to the risk that behaviour may change if participants are aware of the specific practices that will be observed, detailed information about the study could not be provided before data-collection. Detailed information is hereby provided as the data-collection has been completed.

The title of the study is: Compliance to universal precautions in northern Kwa-Zulu Natal operating theatres

The research objectives are:

1. To explore and describe the practices regarding compliance with universal precautions in selected operating theatres in the Northern Kwa-Zulu Natal by means of direct observation.

2. To explore and describe factors influencing compliance with universal precautions as perceived by registered nurses working in operating theatres in Northern Kwa-Zulu Natal.

This study is part of a larger project that aims to use evidence from various studies to develop strategies to enhance compliance to universal precautions against blood borne infections.
Appendix K- Feedback information sheet

Participant’s particulars for feedback regarding the research

I would like to receive a report of the research after it has been completed.
Name: .................................................................
Address: .................................................................
Appendix L

FOCUS GROUP INTERVIEWS SCHEDULE (Phase 2)

Greeting and Explanation

During phase 1 of the study practices re-universal precautions during abdominal operations were observed. There was good compliance to some components of the universal precautions, while other were not well complied. As we were using the checklist for measuring compliance to universal precautions, some of the hospitals did right and other hospitals had a high number of partial compliance.

Your hospital did well in hand washing- both as part of scrubbing and after removing gloves. What are the factors contributing to the high level of compliance in your operating theatre?

1. Are body fluids handled with the same precautions as blood? The majority of personnel we observed did complied in handling body fluids correctly through the use of gloves, eye protection. What do you think contributes to the 20% of non-compliance?

2. Avoidance of sharps injuries. What do you think are some reasons for not handling sharps?

3. In avoiding of skin or mucous membrane contamination, one hospital did particularly poor in hand washing - what could be reasons for this behaviour?

4. Handling of blood and body fluids spillage on skin. Compliance with wearing of plastic aprons, plastic boots was not good in most of the hospitals. What could be the reasons for non-compliance?

5. Spray / Aerosol precautions and decontamination of blood and other body fluids, one hospital had the highest compliance with face/ eye protection while other hospitals had partial compliance and non-compliance. What can be the reasons for partial and non-compliance?

6. Regarding the use of Cleaning/ Disinfecting/ Sterilizing, it seems that the majority of participants in the different hospitals complied except for one where participants were observed to have no knowledge of the strength of disinfection; can you comment on possible reasons?
Appendix M Proof of attendance Ethics course
## Appendix N Biographic information tool

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Appendix O- Transcription (or extract of one of the focus group interviews)

I: Good afternoon colleagues
Rs: Good afternoon
I: How are you?
Rs: We are fine
I: I have got only 3 questions to ask you. The first one is, but just to start at the beginning during this Phase 1 of the study practices re-universal precautions during abdominal operations were observed. There was good compliance to some components of the universal precautions, while others were not well complied. As we were using the checklist for measuring compliance to universal precaution, some of the hospitals did right and other hospitals had a high number of partial compliance. Your hospital did well in hand washing both as part of scrubbing and after removing gloves. What are the factors contributing to the high level of compliance in your operating theatre? What are the factors contributing to the high level of compliance in your operating theatre?
R1: In-service education that is done every morning (clearing her throat)
I: You conduct in-service education training every morning?
Rs: Yes
I: Anything
R2: Is to encourage the staff to attend to the aseptic technique before operation
I: How do you encourage them?
R2: First for, we start with in-service education and by doing demonstration, by demonstrating how to scrub, how to put sterile gloves, and gowning
I: Ok
R3: And other protective materials [inaudible]
R1: We also do the spring cleanings err on the weekends (clears her throat) there on Saturdays we do thorough cleaning it also limits the risk of infection this may help, so we do the thorough cleaning so everybody is allocated to that as there are some people who are there to supervise to see if everything is done well this will limit the risk of infection to the operations
I: Anything more, if nothing will go to the next one will go to the first main question. Are body fluids handled with the same precautions as blood? Are body fluids handled with the same precautions as blood? Here in theatre
R3: Ya yes
I: Do you handle body fluids as you handle blood?

Rs: Yes we do

R2: We protect

R4: We are protecting us by using the sterile gloves so every fluids are treated as blood

R3: And discarding is also the same

R2: Yes especially during induction of anaesthesia we must wear the gloves because during of the induction sometimes the patient may have secretions, we must suction the patient by wearing gloves and to prevent contamination of saliva

I: Thank you, thank you very much then let us carry on, the majority of personnel we observed did comply in handling body fluids correctly through the use of gloves, eye protection. What do you think contributes to the 20% of non-compliance, what do you think contributes to the 20% of those that did not comply? There was this 20% that did not comply we just want to know the reasons that can be contributing to that

R1: It depends some of them while we do the procedures like, like err lets say the one who’s, who’s that close to the patient where the procedure is done like weaning of the anaesthesia but some lets say the person maybe is outside when he send, is send to theatre when he opens there may forget maybe to put on the thing err the protective clothing, ya yes sometimes some doctors when they are busy like the anaesthetist when they are busy with the procedure they may have the err call outside, she has to go outside when she comes back she forgets to put up the, to put the protective clothing

I: You mean the mask

R1: Ya yes the mask it also contributes to the forgetfulness

I: You mean the main contributing factor is forgetfulness

R1: Ya yes I don’t know whether he forgets or is the negligence, (giggles)but it does happen like when lets say like they deceipt them during the procedures like the anaesthetist she or he will have to go outside and come back again then

I: Did you also say its negligence?

R1: Because you know that the procedure is in progress inside whenever you enter that operating room you have to put on the protective clothing so that maybe you must not be the cause of the infection

I: What else can be contributing to this 20% non-compliance?

R3: Sometimes may be is the lack of in-service education maybe especially the newly employed or the students if he fails to get thorough orientation when he comes to operating theatre

I: Oh you think lack of orientation can also contribute to non-compliance
R3: Yes in-service education

R2: Also insufficient err material will also contributes

I: You mean the supplies

R2: Yes the supplies will also contributes

R4: We don't have gloves

I: Does it happen that you run off gloves, you run short of gloves?

R3: No, the sterile ones no but yes it has been happening for the non-sterile gloves, yes

I: What do you use in case you don’t have these unsterile gloves?

R1: We use the sterile ones, let’s say the surgical masks maybe some are wearing inside while maybe they have put someone to lets say like the doctor, the doctor must be there in that time we only and is the only time that you see that ayibo [no] we don’t have sorry the enough surgical masks [giggles] and so we have to borrow if its out of stock we have to rush to the ward to borrow the thing. It does happen to the if the err we don’t have sufficient because sometimes you get the, it’s nowhere to be found in the hospital things that are available its important that you use for this procedures

I: So you said even the wards are using the surgical masks