

# Knowledge and Practice of Standard Precautions and Awareness Regarding Post Exposure Prophylaxis among Interns of B.P. Koirala Institute of Health Sciences, Dharan, Nepal

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**Abstract:** **Introduction:** Standard Precautions represent the minimum infection prevention measures that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where healthcare is delivered.<sup>1</sup> These evidence-based practices are designed to both protect healthcare personnel and prevent the spread of infections among patients. Standard Precautions replaces earlier guidance relating to Universal Precautions and Body Substance Isolation. Standard Precautions include: 1) hand hygiene, 2) use of personal protective equipment (e.g., gloves, gowns, facemasks), depending on the anticipated exposure, 3) respiratory hygiene and cough etiquette, 4) safe injection practices, and 5) safe handling of potentially contaminated equipment or surfaces in the patient environment.<sup>1,2</sup> Direct or indirect transmission of disease can be prevented by applying standard precaution in day to day practices. So CDC recommended that standard precautions must be applied to all patients irrespective of the nature of the disease pattern. There are various modes of transmissions of disease like airborne disease which can be prevented by special air handling measure and ventilator along with use of mask especially in doing suctioning, endotracheal intubation; likewise indirect transmission of infectious agent can be prevented by using personal protective equipments which must be changed after taking care of patient colonized or infected with an infectious agent. Possibilities of transmitting infectious disease do exist in soiled clothes, so changing of such clothes is a must for caring next patient similarly proper use of needle, with appropriate standard technique for disposing it makes disease transmitting directly is minimized. So proper use of standard precautions in hospital setting is very important for all health care workers to prevent transmission of disease from patient to patient, patient to health care worker and healthcare worker to patient. **Objectives:** To assess the knowledge on Standard Precautions and awareness regarding post exposure prophylaxis and to observe the practice of interns on Standard Precautions. **Methods:** This was a cross sectional observational study conducted in the different department of B.P.K.I.H.S. All Interns of MBBS and BDS batch 2011 was considered in this study. Questionnaires were distributed to know the knowledge and attitude of Standard precautions and awareness in post exposure prophylaxis, and all interns were observed to assess the utilization of their knowledge into practice. **Results:** The topic "Sterile technique and standard precautions" is included in curriculum of this batch of interns, this may be the reason that all the respondents have hered the term Standard Precaution, but only 92.5% differentiate it from Universal Precautions. The main reason for not differentiating it correctly was because they forgot the learned things. The correct knowledge among the component of standard precautions was found to be relating to hand washing before and after patient care (95%). Even though they have good knowledge on hand washing only 6.7% washed hand before and after touching, only 86.7% washed hand before putting on gloves and 68.3% washed hand after removing gloves. The main reason for not washing hand was due to rush in the department as well as long distance for water supply. 53.3% of the participant expressed correct knowledge of not bending or recapping needle before disposal but in practice 31% bend/ recapped before disposing it during working hour. Regarding sharps/needle disposals, the entire participant disposed it correctly (100%) even though only 94.2% expressed correct knowledge on it. The appropriate method of needle recapping if needed before disposal is by using one handed technique, 74.2% of the participant followed this. All the Interns of MBBS expressed correct knowledge on every aspect of blood borne disease but only 92.5% of BDS interns answered it correctly especially in mode of transmission of disease. Knowledge on immediate management on sharp injury is good in all interns as they all wash hand with soap and water immediately after exposure, but only 65% were aware about reporting system of needle stick injury in respective department. 96.7% expressed correct knowledge on post exposure prophylaxis and same percentage expressed the correct regimen of it. Among all participant 65% had complete knowledge on the course of treatment. **Conclusion:** Knowledge of standard precautions is very important for all health care workers because it has direct impact in health of patient as well as for themselves, so respective institution should have intervention to utilized standard precautions into practices. Proper use of PPE and changing of every soiled garment, regular hand washing before and after patient care, Safe working environment, adequate and proper sized of PPE supply and proper utilization of available resources are the main measures that help to minimize the transmission of all form of diseases. Strategies should be made for promoting injection safety, proper sharp disposal, proper wastage disposal and handling of wastage so that transmission of BBD is minimized

**Keywords:** Standard precautions, infection control, blood borne diseases, post exposure prophylaxis, injection safety

## Abbreviations

BBD	Blood borne diseases
BSI	Body substances isolation
BP	B.P.Koirala institute of health science
BPKIHS	B.P.Koirala institute of health science
Dept.	Department
EMG.	Emergency
HCWs	Health care workers
HIV	Human immunodeficiency virus

JADA	Journal of American Dental Association
JAMA	The Journal of the American Medical Association
No.	Numbers
NRS	Nepali rupee
OPIM	Other Potentially Infectious Material
OSHA	Occupational Safety and Health Administration
SP	Standard Precaution
UP	Universal precaution
Vs	verses

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## 1. Introduction

### Background of Study

Standard Precautions represent the minimum infection prevention measures that apply to all patient care, regardless of suspected or confirmed infection status of the patient, in any setting where healthcare is delivered.<sup>1</sup>

These evidence-based practices are designed to both protect healthcare personnel and prevent the spread of infections among patients. Standard Precautions replaces earlier guidance relating to Universal Precautions and Body Substance Isolation. Standard Precautions include: 1) hand hygiene, 2) use of personal protective equipment (e.g., gloves, gowns, facemasks), depending on the anticipated exposure, 3) respiratory hygiene and cough etiquette, 4) safe injection practices, and 5) safe handling of potentially contaminated equipment or surfaces in the patient environment.<sup>1,2</sup>

Direct or indirect transmission of disease can be prevented by applying standard precaution in day to day practices. So CDC recommended that standard precautions must be applied to all patients irrespective of the nature of the disease pattern.

There are various modes of transmissions of disease like airborne disease which can be prevented by special air handling measure and ventilator along with use of mask especially in doing suctioning, endotracheal intubation; likewise indirect transmission of infectious agent can be prevented by using personal protective equipments which must be changed after taking care of patient colonized or infected with an infectious agent. Although contaminated clothes do not have the direct possibility of transmitting infectious agent potential do exist for soiled clothes. Similarly, proper use of the needle, with the appropriate standard technique for disposing of it makes disease transmitting directly is minimized.

So proper use of standard precautions in a hospital setting is very important for all health care workers to prevent transmission of disease from patient to patient, patient to healthcare worker and healthcare worker to patient.

There are two ways to prevent transmission of infectious agent: a standard precaution which is applied to all patients regardless of disease pattern and is more oriented in all healthcare setting and other is transmission based precautions which is applied to known infected or suspected to be infected patient which requires additional precautions measure to prevent transmission of infectious agent.

CDC guidelines recommend the use of standard precautions to every patient irrespective of disease illness. In our setting where there is rush esp. in the emergency department and where supply of PPE is not adequate, all fluid should be considered as potentially hazardous as differentiation of fluid types is difficult in such setting.

Needle stick /sharp injuries should be prevented by taking care while using needle, scalpels and other sharps by placing used disposable syringes, scalpels blades and other sharps

items in a puncture-resistant container with a lid that closes and is located

Close to the area in which the item is used. Sharps must be appropriately disinfected and/or destroyed as per the national standards or guidelines; this measure reduces the risk of transmission of blood-borne disease.<sup>3</sup>

Discussion done with previous batch interns showed that due to lack of adequate necessary PPE, rush in the emergency, unavailability of different sized gloves and inaccessibility of water supply are the main reasons for non adherence to SP regularly.

Department of Health HIV post-exposure prophylaxis: Guidance from the UK Chief Medical Officers' Expert Advisory Group on AIDS. London, 2008, estimated that average risk for HIV transmission after percutaneous exposure to HIV-infected blood of 3 per 1000 injuries (0.3%), or of 1 per 1000 (0.1%) after mucocutaneous exposure. There is no risk of HIV transmission where intact skin is exposed to HIV-infected blood.<sup>4</sup>

To minimized disease transmission, Standard Precautions have been widely promoted in developed countries where adequate supply of PPE is accessible.<sup>5</sup> to protect healthcare workers (HCWs) from occupational exposure to blood and sharp injuries and the consequent risk of infection with bloodborne pathogens. In low-income countries, the situation is very different: SP is often practiced partially, if at all, thereby exposing the HCWs to unnecessary risk of infection. Therefore this studies mainly focus on indentifying knowledge of standard precautions and observe whether standard precautions is applied in day to day practices or not and also to make recommendations as to how these could be improved.

## 2. Methodology

The study was conducted in B.P. Koirala Institute of health science, Dharan, the tertiary care center in eastern part of Nepal. This was a cross-sectional observational study. The sample was all Interns of MBBS and BDS batch 2011 of BPKIHS. Questionnaires were distributed to assess the knowledge and attitude of Standard precautions and also the awareness regarding post exposure prophylaxis. Direct observation was done to assess the practice whether they follow all components of standard precautions according to CDC guidelines or not. The open-ended questionnaire was included to access the reason for non-adherence to the practice of SP.

After obtaining informed consent from all the participants, they were asked to fill up this questionnaire within half an hour time. Since all the interns were not available at the same place and at the same time, the process was carried out at the in-patient wards of various departments at different time intervals. Data were collected from October to December.

The Data was entered into Microsoft Excel 2007 and converted it into SPSS 11.5 version for statistical analysis and reported in percentage. Adherence to the component of

standard precautions was assessed by observing the participant during working hours. Demographic variables were not done in this group as all interns must have undergone some form of teaching activities during their training periods.

### 3. Results

The topic “Sterile technique and standard precautions” is included in the curriculum of this batch of interns, this may be the reason that all the respondents have heard the term Standard Precaution, but only 92.5% differentiate it from Universal Precautions. The main reason for not differentiating it correctly was because they forgot the learned things. The correct knowledge among the component of standard precautions was found to be relating to hand washing before and after patient care (95%). Moreover, most of the participant conveyed knowledge on Standard Precautions as follows:

**Table 1:** Knowledge of participant regarding Standard Precautions (n=120)

Knowledge on Standard Precautions	correct	Incorrect
Standard Precautions should be applied to all irrespective of disease pattern	114(95%)	6(5%)
Regular Hand washing should be done before and after patient care	119(99.2%)	1(0.8%)
Soap should be used for hand washing	113(94.2%)	7(5.8%)
Gloves should be worn during handling of potentially infectious materials	117(97.5%)	3(2.5%)
Gloves should be changed for handling every patient	115(95.8%)	5(4.2%)
PPE should be worn to avoid exposure from splashing	115(95.8%)	5(4.2%)
Used needle should never be bent or recapped before disposal	64(53.3%)	56(46.7%)
Methods of recapping from those who recapped	101(84.2%)	19(15.8%)
Method of disposal of sharps/needle after use	113(94.2%)	7(5.8%)
Method of cleaning of spills	106(88.4%)	14(11.6%)

Even though they have good knowledge on hand washing only 6.7% washed hand before and after touching, only 86.7% washed hand before putting on gloves and 68.3% washed hand after removing gloves. The main reason for not washing hand was due to rush in the department as well as long distance for water supply. 53.3% of the participant expressed correct knowledge of not bending or recapping needle before disposal but in practice 31% bend/ recapped before disposing it during working hour. Following are the observed practices seen in interns:

**Table 2:** Practice of participants on Standard Precautions

Practice of participants regarding Standard Precautions	Correct	Incorrect
Wash hand before touching a patient	8(6.7%)	112(93.3%)
Wash hands after touching a patient	80(66.7%)	40(33.3%)
Wash hand before putting on gloves	104(86.7%)	16(13.3%)
Wash hand after removing gloves	82(68.3%)	38(31.7%)
Applied soap for hand washing	90(75%)	30(25%)
Recapping of needle before disposal	89(74.2%)	31(25.8%)
Proper sharps disposal	120(100%)	--
Wearing mask in air borne diseases	55(45.8%)	65(54.2%)

Although the entire participant (100%) disposed sharps properly despite knowledge (94.2%), only 74.2% participant use appropriate method (one handed) of recapping before disposal.

**Table 3:** Knowledge on post exposure prophylaxis (n= 120)

Knowledge on post exposure prophylaxis	Correct	Incorrect
Knowledge on Blood borne disease	120(100%)	-
Transmission of blood borne disease	111(92.5%)	9(7.5%)
Incidence of occupational exposure must be reported	78(65%)	42(35%)
Heard the term post exposure prophylaxis	116(96.7%)	4(3.3%)
Right time to start post exposure prophylaxis	116(96.7%)	4(3.3%)
Knowledge on complete course of treatment	78(65%)	42(35%)

Knowledge on immediate management on sharp injury is good in all interns as they all wash hand with soap and water immediately after exposure, but only 65% were aware about reporting system of needle stick injury in respective department. All the Interns of MBBS expressed correct knowledge on every aspect of blood borne disease but only 92.5% of BDS interns answered it correctly especially in mode of transmission of disease. 96.7% expressed correct knowledge on post exposure prophylaxis and same percentage expressed the correct regimen of it. Among all participant 65% had complete knowledge on the course of treatment.

### 4. Discussion

Standard precautions remain the cornerstone for the prevention of transmission of infectious agent. This study highlights more on identifying the knowledge of standard precautions and complete adherence to it, so that the transmission of infectious agent is prevented.

“Sterile technique and Standard precautions”, this topic is included in curriculum of every stream of undergraduate course in BPKIHS. They attended theoretical classes; in the same posting they were also given practical approaches on different component on standard precautions; however our result showed poor adherences to the component of it despite knowledge.

Knowledge on standard precaution guideline (92.5%), and on recapping of needle before disposal is better (25.8%) in our setting as compared to study done in Kathmandu medical college which is 66% and 79% respectively.<sup>6</sup>

Similar study done in Medical College in West Bengal, India showed nearly similar knowledge on hand washing and regarding use for gloves in taking patient care. But the Practice of not recapping needle before disposal and disposal in proper place is better in our study.<sup>7</sup>

The main reasons for non adherence with standard precautions were; heavy work load, unavailability of adequate personal protective equipment in the department, unavailability of adequate numbers and appropriate sized gloves made them using the same gloves for many patients or not using it. Even though sharp box is not in accessible

area all interns have attitude of disposing needle in sharp box.

Another similar study done in two tertiary hospitals in Nigeria in “Knowledge, attitude and practice of standard precautions of infection control by hospital workers” showed that majority of participant (91.6%) had heard standard precautions even though they are from different strata as compared to ours which is from same strata and of homogenous group. Nearly similar knowledge was found in the handling of sharps (47.7% vs 53.3%), hand washing (95.8% vs 99.2%) and also on practices on hand washing after touching patient (58.5% vs 66.7%). Practices of sharps disposal was poor as compared to ours which is only 63.6%. Similar homogenous group, and curriculum- based practices may be the reason for good practices in sharps disposals in our context.<sup>8</sup>

Another study done in Tertiary care referral center Infection Control Program at the University of Geneva Hospitals showed that it may not be prudent to wash and reuse gloves between patient. Among reasons reported for poor adherence with hand hygiene recommendations, some that are clearly related to the institution (i.e., the system) include lack of institutional priority for hand hygiene, need for administrative sanctions for noncompliance or rewards for compliance, and lack of an institutional climate that encourages safety.<sup>9</sup>

Knowledge on standard precautions is very important for all level of health care worker to prevent disease transmission. Knowledge on hand washing before and after taking care of the patient is very good (99.2%) but only 66.7% translated it into practice.

## 5. Conclusion

Knowledge of standard precautions has a direct effect in the health of all health care workers and for the patient, so regular training, adequate supply of necessary PPE, adequate supply of water and gloves as well as an effective control measure is a must for prevention of disease transmission. The Institution as well as all health providing services must have some intervention to improve SP compliance among all healthcare workers by proving not only knowledge but also safe environmental practices so that risk of nosocomial infections, sharps injury, splashes is to be minimized.

## 6. Recommendations

- Hospital should have adequate supply and sizes of gloves.
- Sharp-box should be in nearby working area so that disposal is easy
- More sharp box needed
- Hand washing basin should be more and nearby working area.
- Availability of soap/hand wash should be frequently monitored.

## References

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