

# Awareness and Compliance to International Patient Safety Goals among Healthcare Personnel of a Tertiary Care Hospital in Northern India

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## ABSTRACT

**Introduction:** Advances and commitment to patient safety worldwide have grown since the late 1990s which have led to a remarkable transformation in the way patient safety is viewed. Having begun as a subject of minor academic interest, it is now embedded in most healthcare systems worldwide. The International Patient Safety Goals (IPSG) are important guidelines developed by Joint Commission International to promote safe and high-quality patient care. Patient safety is the responsibility of every healthcare personnel who is directly or indirectly involved in patient care.

**Aim:** To determine the level of awareness amongst doctors, nurses and technicians and their compliance to IPSG in a tertiary care hospital.

**Materials and Methods:** This observational cross-sectional study was conducted from March to May 2021, in a tertiary care teaching hospital of North India. Stratified sampling technique was used in determining the number of doctors, nurses and technicians required for this study. A validated questionnaire was used to assess the awareness level of healthcare personnel to

IPSG. '1' mark was assigned to each correct answer and '0' were awarded to wrong answers. The data was collected and coded in a Microsoft excel database. Descriptive data analysis was done.

**Results:** A total of 394 patient records/documents were audited for patient safety compliance. It was observed that 339 (86%) documents revealed compliance to all six IPSG. Out of the six goals of IPSG, the best compliance was observed for the fourth goal of IPSG (ensure safe surgery) for which the compliance was 100%. The lowest compliance was observed for 2<sup>nd</sup>, 5<sup>th</sup> and 6<sup>th</sup> goal (improve effective communication, reduce the risk of healthcare associated infection and reduce the patient harm resulting from fall) which was 81%, 80% and 78%, respectively. The awareness questionnaire was given to doctors (n=60), nurses (n=86) and technicians (n=76). The findings revealed that awareness was highest in nurses (84.8%) followed by doctors (81.7%) and technicians (80.2%).

**Conclusion:** The study has found out that the awareness level of doctors, nurses and technicians towards patient safety goals is good. Further quality improvement in this field can be achieved by conducting on the job training, workshops, lectures and seminars.

**Keywords:** Healthcare-associated infections, Look-alike/sound-alike medications, Patient identification

## INTRODUCTION

Healthcare is a rapidly evolving field of science and with the advent of sophisticated diagnostic and therapeutic medical equipment the operational environment in hospitals is becoming more complex. This in turn reiterates the need of preventing harm to patients during their treatment in hospitals. Patient safety is a global public health issue and as per World Health Organisation (WHO) newsletter dated 26 August 2019, one in ten patients in developed countries suffer harm while receiving hospital care. However, in developing countries, the probability of patients getting harmed in hospitals is higher. In some developing countries, the danger of healthcare-associated infection is 20 times more than the developed countries. The 55<sup>th</sup> World Health Assembly (WHA) deliberated upon the report on patient safety and urged member states to pay the closest possible attention to the problem of patient safety; and to establish and strengthen science-based systems, necessary for improving patients' safety and the quality of healthcare, including the monitoring of drugs, medical equipment and technology [1].

The failure to identify patients correctly results in medication errors, transfusion errors, testing errors and wrong person procedures. The most error-prone communications are patient care orders given verbally and over the telephones. Additional error-prone communication is reporting back of critical test results over the phone. Medications that have high-risk for adverse outcomes are Look-Alike and Sound-Alike (LASA) medications. In hospitals, wrong-

site, wrong-patient surgery and wrong procedure is an alarmingly common occurrence. Ineffective or inadequate communication between members of the surgical team, lack of patient involvement in site marking and lack of procedures for verifying the operation site are additional causes to these errors. Healthcare-Associated Infections (HAIs) are often serious and even deadly for patients. The International Patient Safety Goals (IPSG) laid down by Joint Commission International (JCI) in 2006 are important guidelines at the international level to promote specific improvements in the process of providing safe and high-quality care to patients [2].

**Goal 1- Identify patients correctly:** The objective of this goal is two-fold: first, to reliably identify the patient for giving the service or treatment and secondly to match the service or treatment to that particular patient. The identification process used throughout the hospital requires a minimum of two criteria like the patient's name, MRD/UHID no, birth date and a barcoded wristband [3].

**Goal 2- Improve effective communication:** Communication is considered to be effective in reducing errors and improving patient safety when it is timely, accurate, complete, unambiguous and well understood by the recipient. Verbal orders are NOT allowed and are acceptable only in life threatening conditions where read back procedure is strictly enforced. All verbal orders are to be countersigned by the doctor who has given orders within 24 hours [4].

**Goal 3- Improve the safety of high-alert medications:** Any medication, which people often purchase without a prescription, if

used improperly can cause injury. Examples of high alert medications include investigational medications, controlled medications, chemotherapy drugs, anticoagulants, psychotherapeutic medications and LASA [5,6].

**Goal 4- Ensure correct site, correct procedure and correct patient surgery (Safe surgery):** Patient injury and adverse/sentinel events resulting from wrong site, wrong procedure and wrong patient surgery are continuous concerns for hospitals. It is mandatory that the site marking is done by the surgeon or the physician of the surgical team. Surgical Safety Checklist (SSC) must be filled to ensure safe surgery/procedure. Site marking has an upward arrow (↑) only. Putting a cross (X) is not recommended [2].

**Goal 5- Reduce the danger of HAI:** Infections common to all or any healthcare settings include Catheter-Associated Urinary Tract Infections (CAUTI), Central Line Associated Blood Stream Infections (CLABSI) or septicaemia and Ventilator Associated Pneumonia (VAP). Hand hygiene guidelines are required to be posted in appropriate areas and staff is required to be educated for proper hand washing and hand disinfection procedures [7].

**Goal 6- Reduce the risk of patient harm resulting from falls:** Risk of fall is assessed using Morse Fall Scale for adults and Humpty Dumpty tool for paediatric patients. All precautions to prevent patient fall must be taken such as: keeping the bed rails upright, using strap belts while transporting the patients on wheel chair, using fall caution board while moping etc [8].

Patient safety is a serious global public health concern and this gets further compounded by the fact that the awareness level to IPSPG is low among healthcare workers. The study conducted by Brasaite I et al., on physicians, nurses and nursing assistants was aimed to describe healthcare professionals' knowledge regarding patient safety [9]. IPSPGs aim to encourage specific improvements in patient safety by focusing on six key problematic areas identified by the JCI. By including these key six areas in everyday practice, healthcare providers can improve patient safety and patient outcome. In view of the same, present study was aimed to assess the present state of awareness among healthcare workers to the following IPSPGs which are crucial for patient safety.

## MATERIALS AND METHODS

This observational cross-sectional study was conducted from March 2021 to May 2021, in a tertiary care teaching hospital of North India. In-principle concurrence was accorded by ethics committee for the study since patient data being audited in this study was of routine nature in the concerned setting and did not breach any patient confidentiality/ethical parameters/or involve any human clinical trials. The healthcare staff that had consented to participate in the study was included in the awareness audit through questionnaire.

**Inclusion criteria:** Doctors, nurses and technicians serving in critical patient care areas and acute patient care wards where the patient was still under active management of medical staff and who have voluntarily agreed to participate in this study, and were between 25-45 years of age were included in the study.

**Exclusion criteria:** Since, the study was focused on high risk critical areas and acute wards, the other wards/departments {(Chronic Patient Care Wards and Outpatient Departments (OPD))} were excluded from the study.

**Sampling technique:** The stratified random sampling technique was used. A questionnaire, comprising of 15 Multiple Choice Questions (MCQs) and 25 fill-in-the-blanks, based on IPSPG, was given to doctors (60), nurses (86), and technicians (76). The questionnaire consisted of basic questions pertaining to IPSPG laid down by JCI in 2006.

**Pilot study:** A pilot study was undertaken to test the validity of the questionnaire prior to its implementation with 5 doctors, 10 nurses and 10 technicians. This pilot study was done on healthcare staff to test the clarity and simplicity of the questions and the appropriateness of the wording in the questionnaire. Modification and reformation were made in some of the questions to ensure better comprehension.

## Study Procedure

The study was conducted in two phases:

- In first phase, an audit of documentation pertaining to patient safety criteria in patient records (n=394) was carried out to verify compliance to IPSPGs by the staff. Purposeful sampling was used to select these patient records. A checklist of patient safety criteria to be observed for this audit was formulated based on the IPSPGs (enclosed as appendix). Checklist criteria which were not at all followed were marked as complete non compliance and which were partially met were marked as partial non compliance.
- Second phase was to study the awareness among the participants with the help of a questionnaire. The sample size was drawn by stratified random sampling technique. 20% of the staff under each subgroup was randomly considered for sampling. The number of willing participants in each category was selected for the awareness study.

The questionnaire was distributed among the participants to assess their awareness to all six patient safety goals. '1' mark was given for right answer and wrong answers were marked '0'. Out of the two correct identifiers, even if one option was correctly ticked by the respondents, benefit of doubt was given and one mark was allotted to the answer. Thereafter, the marks obtained in each category were compiled for statistical analysis.

## STATISTICAL ANALYSIS

The data was collected and coded in a Microsoft excel database. Descriptive data analysis was done.

## RESULTS

A total of 394 patient records/documents were selected for observing compliance towards IPSPG. A questionnaire consisting of basic questions pertaining to IPSPG and was given to doctors (n=60), nurses (n=86), and technicians (n=76) to check their awareness to these goals. Demographic characteristics of participants in this study in terms of age, gender and professional experience is tabulated in [Table/Fig-1].

The summary of findings of the audit with reference to compliance to each of the goals N (%), non compliance N (%), areas of non compliance, N (partial non compliance) and N (complete noncompliance) to each of the IPSPG is tabulated in [Table/Fig-2].

**Findings of awareness questionnaire/audit:** The MCQs used in the questionnaire are tabulated in [Table/Fig-3]. The summary of response/awareness level n (%) among doctors, nurses and technicians to each of the IPSPG and overall awareness level is depicted in [Table/Fig-4]. It was observed from the survey that as compared to other goals, the awareness among doctors was observed to be low towards, correct site/procedure/patient for surgery (IPSPG-4) and risk of patient harm from falls (IPSPG-6). Similarly, awareness among nurses to IPSPG was found to be lower towards effective communication (IPSPG-2), whereas awareness among technicians was lower towards safety of high alert medicines (IPSPG-3) and reducing patient harm from falls (IPSPG-6).

Statistical analysis of correct responses to questionnaire in relation to age, gender and work experience was carried out and the same is tabulated as under [Table/Fig-5].

Category	Age distribution (years), n (%)			Mean±SD age (years)	Gender, n (%)		Professional experience (years), n (%)				Mean±SD experience (years)
	25-30	31-40	41-45		Male	Female	1-5	6-10	11-15	>15	
Doctors (n=60)	14 (23.3)	35 (58.4)	11 (18.3)	35.1±5.3	33 (55)	27 (45)	07 (11.7)	13 (21.6)	25 (41.7)	15 (25)	11.9±4.8
Nurses (n=86)	22 (25.6)	48 (55.8)	16 (18.6)	34.8±5.1	30 (35)	56 (65)	10 (11.6)	28 (32.5)	35 (40.7)	13 (15.2)	10.9±4.5
Technician (n=76)	13 (17.1)	53 (69.7)	10 (13.2)	35.1±4.2	53 (70)	23 (30)	09 (11.8)	17 (22.4)	31 (40.8)	19 (25)	11.8±4.8
Total (n=222)	Mean±SD whole population=35±4.9 years				Avg. no. of males=39 Avg. no. of females=35		Mean±SD experience whole population=11.5±4.7 years				

[Table/Fig-1]: Demographic characteristics.

IPSG Goal	Compliance n (%)	Non compliance n (%)	Areas of non compliance	n (partial non compliance)	n (complete non compliance)
1	339 (86)	55 (14)	<ul style="list-style-type: none"> <li>Application of patient identification bands</li> <li>Identification of patients before giving medications</li> </ul>	48 46	07 09
2	319 (81)	75 (19)	<ul style="list-style-type: none"> <li>Point of care testing (POCT)</li> <li>Filling transfer out forms</li> </ul>	45 41	30 34
3	362 (92)	32 (8)	<ul style="list-style-type: none"> <li>Safety of high-risk medicines during administration</li> <li>Safe storage of high-risk medications</li> </ul>	29 22	03 10
4	394 (100)	-	-	-	-
5	315 (80)	79 (20)	<ul style="list-style-type: none"> <li>Moments of hand hygiene</li> <li>Steps of hand washing</li> </ul>	62 68	17 11
6	307 (78)	87 (22)	<ul style="list-style-type: none"> <li>Assessment of patient fall risk</li> <li>Educating patients on risk of fall</li> </ul>	70 52	17 35

[Table/Fig-2]: Compliance audit patient records (n=394).

IPSG goal no.	Goals	MCQs
1	Identify patients correctly	<ul style="list-style-type: none"> <li>* Tick the two identifiers for patient identification?</li> <li>* Do you identify patients with room number?</li> <li>* Patient Identification applies on..... goal?</li> </ul>
2	Improve effective communication	<ul style="list-style-type: none"> <li>* In which situation are verbal orders accepted?</li> <li>* How do you give handovers on shift change?</li> <li>* How do you confirm a critical test result?</li> </ul>
3	Improving safety of high alert medications	<ul style="list-style-type: none"> <li>* LASA stands for?</li> <li>* Concentrated electrolytes should be kept in?</li> </ul>
4	Safety of surgical procedure	<ul style="list-style-type: none"> <li>* For surgical site marking you can use?</li> <li>* Who performs the surgical time out?</li> </ul>
5	Reduction of healthcare associated infection	<ul style="list-style-type: none"> <li>* How many moments of hand hygiene?</li> </ul>
6	Reduce the risk of patient harm resulting from fall	<ul style="list-style-type: none"> <li>* While transferring patients on wheel chair, one should ensure that?</li> <li>* Paediatric fall risk assessment is done by?</li> <li>* To prevent patient fall in wards, following precautions must be taken?</li> <li>* Fall risk screening should be done in OPD as well as IPD?</li> </ul>

[Table/Fig-3]: MCQs pertaining to IPSG.

Category	Goal 1 n (%)	Goal 2 n (%)	Goal 3 n (%)	Goal 4 n (%)	Goal 5 n (%)	Goal 6 n (%)	Overall response/awareness n (%)
Doctors (n=60)	55 (92)	45 (75)	48 (80)	44 (73)	58 (97)	46 (77)	49 (81.7)
Nurses (n=86)	77 (89)	57 (66)	74 (86)	70 (81)	81 (94)	78 (91)	73 (84.8)
Technicians (n=76)	70 (92)	61 (80)	53 (70)	61 (80)	66 (87)	54 (71)	61 (80.2)
Overall (n=222)	202 (91)	163 (73)	175 (79)	175 (79)	205 (92)	178 (80)	183 (82.4)

[Table/Fig-4]: IPSG goals by participants (n=222) response.

Category (N)	Total correct response, n (%)	Correct responses based on age (yrs), n (%)			Correct response based on gender, n (%)		Correct response based on experience (years), n (%)			
		25-30	31-40	41-45	Male	Female	1-5	6-10	11-15	>15
Doctors (n=60)	49 (81.7)	10 (20.4)	29 (59.2)	10 (20.4)	22 (45)	27 (55)	05 (10.3)	09 (18.3)	23 (47.0)	12 (24.4)
Nurses (n=86)	73 (84.8)	10 (13.7)	40 (54.8)	23 (31.5)	22 (30)	51 (70)	07 (9.6)	24 (32.9)	31 (42.4)	11 (15.0)
Technician (n=76)	61 (80.2)	04 (6.5)	49 (80.3)	08 (13.2)	38 (62.3)	23 (37.7)	04 (6.5)	12 (19.8)	29 (47.5)	16 (26.2)
Total (n=222)	183 (82.4)	24 (13.1)	118 (64.5)	41 (22.4)	82 (44.8)	101 (55.2)	16 (8.7)	45 (24.6)	83 (45.4)	39 (21.3)

[Table/Fig-5]: Correct responses and the demographic variables (n=222).

## DISCUSSION

This study was primarily aimed at studying the awareness and compliance to IPSG among healthcare workers i.e. doctors, nurses and technicians. Compliance to the patient safety goals which was documented in patient records, was audited to gain

insight into the practical implementation of these patient safety parameters. A total of 394 patient records/documents pertaining to high-risk critical patient care areas like operation rooms, Intensive Care Units (ICU), Emergency Department, and acute care wards were audited. The compliance to correct identification of patients

(IPSG-1) was 339 (86%). The non compliance as regards IPSG-1 was primarily in two areas i.e. application of patient identification bands and identification of patients before giving medications. This observation synchronises with the findings of Hoffmeister LV and de Moura GM, where in they found that 83.9% of the patients were found to have correctly identified wristbands [10]. The compliance to improving effective communication (IPSG-2) was 319 (81%) with a non compliance rate of 75 (19%). Pronovost P et al., observed that, less than 10% of residents and nurses understood the goals of patient care. However, after implementing the safety goals form the percentage of residents and nurses who understood the daily goals increased to over 95% [11]. This implies that the non compliance can be reduced by stressing the importance of patient safety goals to the healthcare workers.

The Institute for Safe Medication Practices (ISMP) defines high alert medications as drugs that bear a heightened risk of causing significant patient harm when they are used in error [12]. Improving safety of high alert medications assumes great importance in patient safety (IPSG-3). These medicines require special safeguards in terms of proper storage and are required to be kept under lock and key to exercise proper control and restricting accessibility. The findings of the study reveal that compliance to safe storage of high risk medications was 362 (92%). It was observed during the study that the high-risk medication cupboards were not kept locked and these medications including LASA were not properly labeled during storage thereby posing a risk of medication error.

Wrong site, wrong patient and wrong surgery can be prevented if adequate precautions are taken for patient safety. This aspect has to be considered by all healthcare workers i.e. doctors, nurses and technicians. For ensuring safe surgery, a surgical safety check list has been devised by WHO in 2009 [13]. This audit revealed that the compliance to safe surgery (IPSG- 4) was 100% thereby indicating that adequate precautions were taken by all healthcare workers to safeguard patients from wrong site surgery. The HAls delay the healing process thereby increasing the duration or length of stay of patients in hospitals. This directly impinges on the cost of treatment and escalates out of pocket expenses for the patient. IPSG-5 deals with safety against hospital acquired infections. The best way to prevent HAI is by effective hand washing practices. The non compliance of 79 (20%) observed in the study was primarily due to non conformance to hand hygiene and hand washing practices. It was observed during the study that healthcare staff was found skipping moments of hand hygiene and steps of hand washing as given by WHO [14]. However, the compliance in this study was 315 (80%) as against the compliance of 43.2% as reported by Sharma S et al., on hand hygiene compliance in an ICU of a tertiary care hospital [7].

According to Mahoney JE et al., fall-related injuries account for upto 15% of rehospitalisations in the first month after discharge from hospital [15]. Hence, risk assessment for patient harm from falls is important in hospitals. Humpty dumpty scale for paediatric patients and Morse scale for adults is used for risk assessment of fall [16]. As the patients are in a morbid state or are physically weak due to the illness, the fall of patients can happen from wheel chairs/trolley, fall on slippery and wet floors, non use of side railing on patient beds etc. The compliance to reduce patient risk of harm from falls (IPSG-6) in the study was 307 (78%) with a non compliance of 87 (22%). The non compliance observed was primarily due to non use of fall assessment scales and not educating patients on use of safety belts and fall caution on slippery floors especially in wash rooms.

The result of the compliance audit of patient records brought out, that the areas which need more focus are 2<sup>nd</sup>, 5<sup>th</sup> and 6<sup>th</sup> goal of IPSG which are 'improve effective communication', 'reduce the risk of healthcare associated infection', and 'reduce patient harm

resulting from fall'. These three goals with minimal compliance need adequate focus as they play a very vital role in patient safety.

Questionnaire containing MCQs and fill-in-the-blanks related to international patient safety was given to doctors, nurses and technicians. The demographic characteristics reveal that mean age for the whole population participating in this study was 35±4.9 years with a mean experience of 11.5±4.7 years. The correct responses to the questionnaire also commensurate with the above demographic data, however, the awareness level in female doctors and nurses was observed to be more as compared to their male counterparts except among the technicians. The above findings of the study is at variance with the study findings of Asem N et al., where they observed no difference in knowledge, attitude, and influence scores by personal characteristics as gender, specialty, workplace and experience year [17]. It was observed from the questionnaire survey, that awareness of doctors was lower towards correct site/marketing for surgery (IPSG-4) and risk of patient harm from falls (IPSG-6), whereas the awareness level among nurses was lower towards effective communication (IPSG-2). The technicians were found to have lower awareness towards safety of high alert medicines (IPSG-3) and reducing patient harm from falls (IPSG-6). The overall awareness was found to be highest in nurses 73 (84.8%) followed by doctors 49 (81.7%) and technicians 61 (80.2%). This was much higher than the findings brought out in the study by Ananya R et al., which revealed the compliance to be 72% in doctors followed by nurses with 69% and paramedics with 68% [2]. Another study by Hao HS et al., observed that patient safety grade was higher in doctors and technicians as compared to nurses [18]. The results of awareness study clearly indicate the necessity of training of healthcare staff towards the significance of patient safety goals. It is recommended that organising regular symposia/seminars, lectures and on the job training can immensely enhance awareness and compliance to IPSGs.

### Limitation(s)

As the compliance audit of patient records/documents of all patient care areas/wards of the hospital was not possible, in this limited time period, the study was limited to high-risk critical patient care areas like operation rooms, ICU, Emergency Department, and acute patient care wards.

### CONCLUSION(S)

The results of compliance audit and awareness study amplify the present status and knowledge of healthcare staff towards IPSG. Though, the compliance gathered from the data can be termed as good, hospitals must always strive for continuous quality improvement in this area. It was observed that the cause of non compliance with IPSG by staff was inadequate knowledge or reduced concern for safety or a combination of both. Out of the six goals of IPSG, the documented non compliance was observed to be more for 2<sup>st</sup>, 5<sup>th</sup> and 6<sup>th</sup> goal. Furthermore, the result of awareness among staff was found to be highest in nurses 73 (84.8%) followed by doctors 49 (81.7%) and technicians 61 (80.2%). The study has also brought out the areas of non compliance to each of the patient safety goals. Remedial measures in the form of organising regular symposia/seminars, lectures, workshops and on the job training has been recommended to the hospital authorities. Additionally, the new staff joining the hospital also need to be sensitised on patient safety measures.

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**Appendix: Patient safety criteria for compliance audit**

International patient safety goal (IPSG)	Patient safety criteria to be checked in patient documents
IPSG 1	Patient identification bands compliance
	Patient identification before medication/diagnostics/etc.
IPSG 2	Doctors' handover compliance
	Nursing handover compliance
	Point of care testing (POCT) and critical alert compliance
	Transfer out form compliance
IPSG 3	High alert medication storage compliance
	Double check before administration compliance
IPSG 4	Surgical site marking compliance
	Time out
	Sign out
IPSG 5	Five moments of hand hygiene being followed
	Steps of hand washing being followed
IPSG 6	Side rails up in-patient beds
	Patients being transferred on wheel chair with seatbelts
	Fall risk screening being done in OPD
	Patient education on fall risk in OPD
	Patient education on fall risk in IPD
	Paediatric fall risk assessment done in humpty dumpty tool