

## **Patient Safety Goals' Level of Attainment in Selected Tertiary Hospitals in Manila, Philippines: A Preliminary Study**

Kenji Hennessy C. Abe<sup>1</sup>, Cyruz P. Tuppal<sup>2</sup>

<sup>1</sup>Prince Sultan Military Medical City, Kingdom of Saudi Arabia

<sup>2</sup>St. Paul University Philippines System, Philippines; Ministry of Health, Oman; Universitas Pelita Harapan, Jakarta, Indonesia

Corresponding Author: Cyruz P. Tuppal ([drcyruztuppal@gmail.com](mailto:drcyruztuppal@gmail.com))

### **ABSTRACT**

**Background:** Continuous efforts in the implementation of the National Patient Safety Goals (PSG) as a framework to guide the service providers have been made. However, there are reported incidents of untoward patient outcomes due to wrong medication administration, wrong site of surgical operation, acquisition of healthcare-associated infections, adverse reactions, and incidence of fall.

**Purpose:** This study aimed to evaluate the PSGs' level of attainment in selected tertiary hospitals in Metro Manila, Philippines.

**Methods:** This study employed a field, descriptive and historical research survey conducted in three tertiary hospitals in Metro Manila. The participants were nurses having at least one year of experience in their current workplace ( $n=214$ ). The sets of questionnaires used to get the data include the demographic profile and PSGs indicators adapted from the National Patient Safety Goals (NPSGs). Data responses were analyzed with descriptive statistics and One-Way ANOVA.

**Results:** Based on the findings, the PSGs level of attainment obtained high extent with overall mean average: PSG 1 ( $M=4.35$ ), PSG 2 ( $M=3.97$ ), PSG 3 ( $M=4.07$ ), PSG 4 ( $M=3.61$ ), PSG 5 ( $M=3.89$ ), PSG 6 ( $M=3.77$ ) and PSG7 ( $M=4.20$ ). Furthermore, there were significant differences on PSG 3 and PSG 4 with p-values of 0.00 and 0.02 respectively, which were tested at 0.05 level of significance. Others PSGs showed no significant differences.

**Conclusion:** The results indicate that the selected hospitals in Metropolitan Manila, Philippines have a high level of attainment for patient safety goals and remains at the core of health service delivery in each organization. It is recommended that the hospital further enhance the knowledge, skills, and attitudes towards a sustained patient safety culture through continuing education programs, benchmarking, institutionalization, and accreditation.

**Keywords:** Patient safety goals; Philippines; nurses

### **BACKGROUND**

Patients seek healthcare services to address and improve certain conditions. When patients accept the sick role, they give their trust and confidence to the members of the

healthcare team and the institution with expectations for safety and recovery. The healthcare service organizations play a pivotal role in promoting patient safety. The National Patient Safety Goals (NPSGs) set a framework to ensure safety. However, there were reported untoward patient outcomes including wrong medication administration, wrong site of surgical operation, healthcare-associated infections (HCAIs), adverse reactions, and the incidence of fall (Donaldson, Corrigan, & Kohn, 2000; Harrison, Cohen, & Walton, 2015; Marjadi & McLaws, 2010; Navoa-Ng et al., 2011; Nguyen et al., 2001; Robst, 2015; Seiden & Barach, 2006).

The World Health Organization (2018) surmised that in the developed countries, patients are harmed while receiving hospital care, and of every hundred 100 hospitalized patients at any given time, 7 in developed and 10 in developing countries will acquire HCAIs. Harrison et al. (2015) supported the WHO's Health Facts stating that in Southeast Asia limited knowledge about the patient harm is a patient safety threat. Harrison et al. (2015) further surmised Indonesia, Vietnam, the Philippines and Laos, HCAIs are prevalent among the neonates, patients who had invasive procedures, high body temperature, extended hospital stays (i.e., >6 days), antibiotic use or were admitted to an ICU unit. These HCAIs have been associated with limited knowledge and preventive measures, lack of written protocols, and reliance on verbal orders as found in Indonesia (Marjadi & McLaws, 2010). Surgical-site related infections are on the rise in Vietnam albeit preventive measures (Nguyen et al., 2001). In the Philippines, HCAIs have been commonplace (e.g., ventilator-associated pneumonia, central line and catheter-associated urinary tract infection) due to poor hand hygiene, and non-compliance by healthcare workers with infection-control policies, (Gill et al., 2009; Navoa-Ng et al., 2011; Rosenthal et al., 2008; Rosenthal et al., 2013). Another preventable patient harm includes inappropriate, unnecessary antibiotics prescription and administration errors (e.g., incorrect timing, frequency, and preparation) contributed to the patient harm (Marjadi & McLaws, 2010).

Patient harm accounts for other healthcare-associated outcomes preventing the provision of safe, effective, efficient, quality, timely, and relevant care. The WHO initiated global safety strategies to prevent the detrimental effects of HCAIs and other associated issues related to patient harm such as long-term disability and deaths, and high incurred out-of-pocket medical expenses due to more extended hospital stays and non-responsiveness to drug resistance (World Health Organization, 2018). On the other hand, the Joint Commission International (JCI) aids to standardize, improve quality of services, and promote patient safety as a response to the growing concern on patient harm (Joint Commission International, 2007). The PSGs are ever changing and continuously being modified to meet the demands of healthcare services but contain same core elements and objectives of ensuring patient safety. These goals serve both as guide and challenge for the healthcare institutions.

In the Philippine, the Department of Health (DoH) reinforces and institutionalizes the implementation of quality assurance where patient safety becomes the pillar of quality care as a response to the 55<sup>th</sup> World Health Assembly held on May 18, 2002 (Department of Health, 2008). The issuance of Administrative Order (AO) No. 2008 – 0023 aims to “ensure that patient safety is institutionalized as a fundamental principle of

the health care delivery system in improving health outcomes” (Department of Health, 2008, p. 1). Furthermore, the AO lays its foundation grounded in the critical elements of a patient safety program including leadership, institutional development, reporting system, feedback and communication, adverse event prevention and risk management, the disclosure of reported serious events, professional development, and patient-centered care, and empowerment of consumers.

With this, the DoH and the Philippine Health Insurance Corporation (PHIC) are working collaboratively with other service partners in ensuring patient safety. In a similar vein, the service providers endeavor to standardize services through accreditation either local or international to ensure patient safety. Despite the increasing awareness of safety and development of goals, patient harm remains a concern and creating a culture of safety has been the targeted by these institutions. However, the paucity of evidence prompted the Department of Health (2008) that “there is a dire need to encourage more research into patient safety, epidemiological studies of risk factors, effective protective interventions, assessment of the associated cost of damage and protection” (p. 1). Hence, the researchers were motivated in the conduct of this preliminary evaluation to investigate the critical elements of NPSGs level of attainment in selected tertiary hospitals. The findings of this preliminary study hope to contribute to the existing body of knowledge in the implementation of patient safety in the Philippines, develop a holistic model for patient safety, and propose future studies on how nursing service can implement PSG effectively.

#### **PURPOSE**

This study aimed to evaluate the level of attainment of patient safety goals among nurses in selected tertiary hospitals in Metro Manila, Philippines.

#### **METHODS**

This study employed a field, descriptive and historical research survey designs. There were three tertiary hospitals with a bed capacity ranged from 300-500 and categorized as specialty and teaching hospitals were chosen as the research locale. Before the data collection, the researchers sought for ethical approval from each institution in coordination with the Nursing Service Offices. Upon the receipt of the approval, the researchers personally distributed the questionnaires to the eligible participants. The eligible participants were selected with at least one year of experience in their current workplace primarily from surgery/operating room, infection control, and clinical units where patient safety indicators are considered to be critical. Two-hundred fourteen nurses were informed and consented about the conduct of the study, their voluntary participation, and rights to anonymity and confidentiality. The researchers were available for any queries regarding the administration of the questionnaires.

The self-rated questionnaires were content, and face validated by three experts in this field guided by the NPSG indicators as the primary source (Joint Commission International, 2007). Each participant evaluated the indicators using a 5-point Likert scale (5-attained at a very high extent and 1-attained at a very low extent). The questionnaires also underwent a pre- and post-test and revealed high reliability ( $\alpha > .70$ ).

Descriptive statistics were utilized in describing the demographic profile of the participants; weighted averages were utilized to determine the level of attainment on patient safety goal wherein areas with at least 3.50 are considered strengths while weighted averages less than 3.50 are weaknesses. The One-Way ANOVA was used to measure the significant differences in the PSG level of attainment. The data were computed using SPSS.

## RESULTS

### Profile Characteristics

Table 1 shows the frequency and percentage distribution of participants' profile characteristics. Among the participants, 89.25% were staff nurses, and 10.75% were managers and supervisors. Majority of the participants with 76.20% ( $n=164$ ) were in <1 to 5 years of service. As many as 12.60% ( $n=27$ ) were in >5 to 10 years of experience. Those with >10 to 15 years and more than 15 years in both service garnered 5.61% ( $n=12$ ). Furthermore, 96.73% ( $n=207$ ) were BSN graduates, while 2.80% ( $n=6$ ) were master's degree holder and 0.47% ( $n=1$ ) was a doctorate degree holder.

Table 1. Distribution of profile characteristics ( $n=214$ )

Profile Characteristics	f	%
Position		
Managerial or Supervisory	23	10.75
Staff Nurse	191	89.25
Length of Service		
Less than 1-5 years	164	76.20
5-10 years	27	12.60
11-15 years	12	5.61
More than 15 years	12	5.61
Highest Educational Attainment		
BSN Graduate	207	96.73
Master's Degree Holder	6	2.80
Doctorate Degree Holder	1	0.47

### PSGs' Level of Attainment in Selected Tertiary Hospitals in the Philippines

PSG No. 3 indicators obtained high means include: label of all medications, medication containers, and other solutions on and off the sterile field in perioperative and other procedural settings ( $M=4.28$ , High Extent), reduce the likelihood of patient harm associated with the use of anticoagulant therapy ( $M=3.96$ , High Extent) and maintain and communicate accurate patient medication information ( $M=4.17$ , High Extent). PSG No. 4 obtained high means include: leaders establish alarm system safety as a hospital priority ( $M=4.17$ , High Extent), identify the most critical alarm signals to manage ( $M=3.81$ , High Extent), establish policies and procedures for managing the alarms ( $M=3.59$ , High Extent), and educate staff and licensed independent practitioners about the purpose and proper operation of alarm systems for which they are responsible ( $M=3.64$ , High Extent). PSG No. 5 indicate the following obtained means: comply with either the current CDC or the current WHO hand hygiene guidelines ( $M=3.80$ , High Extent), implement evidence-based practices to prevent HCAs due to multidrug-resistant organisms in acute care hospitals ( $M=3.91$ , High Extent), implement evidence-

based practices for preventing surgical site infections ( $M=3.85$ , High Extent) and implement evidence-based practices to prevent indwelling catheter-associated urinary tract infections (CAUTI) ( $M=4.13$ , High Extent). PSG No. 6 obtained a high mean regarding identify patients at risk of suicide ( $M=3.77$ , High Extent). PSG No. 7 indicators obtained means were: conduct a pre-procedural verification process ( $M=4.44$ , High Extent) followed by mark the procedure site ( $M=3.82$ , High Extent) and time-out is performed before the procedure ( $M=4.34$ , High Extent).

Table 2 shows the mean distribution of the level of attainment in selected tertiary hospitals. PSG No. 1 indicators obtained high means include the use of at least two patient identifiers when providing care, treatment, and services ( $M=4.31$ , High Extent) and eliminate transfusion errors related to patient misidentification ( $M=4.38$ , High Extent). PSG No. 2 indicators obtained high means include reporting critical results of tests and diagnostic procedures on a timely basis ( $M=3.97$ , High Extent). PSG No. 3 indicators obtained high means include: label of all medications, medication containers, and other solutions on and off the sterile field in perioperative and other procedural settings ( $M=4.28$ , High Extent), reduce the likelihood of patient harm associated with the use of anticoagulant therapy ( $M=3.96$ , High Extent) and maintain and communicate accurate patient medication information ( $M=4.17$ , High Extent). PSG No. 4 obtained high means include: leaders establish alarm system safety as a hospital priority ( $M=4.17$ , High Extent), identify the most critical alarm signals to manage ( $M=3.81$ , High Extent), establish policies and procedures for managing the alarms ( $M=3.59$ , High Extent), and educate staff and licensed independent practitioners about the purpose and proper operation of alarm systems for which they are responsible ( $M=3.64$ , High Extent). PSG No. 5 indicate the following obtained means: comply with either the current CDC or the current WHO hand hygiene guidelines ( $M=3.80$ , High Extent), implement evidence-based practices to prevent HCAs due to multidrug-resistant organisms in acute care hospitals ( $M=3.91$ , High Extent), implement evidence-based practices for preventing surgical site infections ( $M=3.85$ , High Extent) and implement evidence-based practices to prevent indwelling catheter-associated urinary tract infections (CAUTI) ( $M=4.13$ , High Extent). PSG No. 6 obtained a high mean regarding identify patients at risk of suicide ( $M=3.77$ , High Extent). PSG No. 7 indicators obtained means were: conduct a pre-procedural verification process ( $M=4.44$ , High Extent) followed by mark the procedure site ( $M=3.82$ , High Extent) and time-out is performed before the procedure ( $M=4.34$ , High Extent).

*Table 2. Patient safety goals' level of attainment*

	Indicators	Mean	Interpretation
PSG 1	1. Use at least two patient identifiers when providing care, treatment, and services	4.31	High Extent
	2. Eliminate transfusion errors related to patient misidentification	4.38	High Extent
PSG 2	3. Report critical results of tests and diagnostic procedures on a timely basis	3.97	High Extent
PSG 3	4. Label all medications, medication containers, and other solutions on and off the sterile field in perioperative and other procedural settings	4.28	High Extent

	Indicators	Mean	Interpretation
	5. Reduce the likelihood of patient harm associated with the use of anticoagulant therapy	3.96	High Extent
	6. Maintain and communicate accurate patient medication information	4.17	High Extent
PSG 4	7. Leaders establish alarm system safety as a hospital priority.	3.81	High Extent
	8. Identify the most critical alarm signals	3.69	High Extent
	9. Establish policies and procedures for managing the alarms identified in No. 2.	3.59	High Extent
	10. Educate staff and licensed independent practitioners about the purpose and proper operation of alarm systems for which they are responsible	3.64	High Extent
PSG 5	11. Comply with either the current Centers for Disease Control and Prevention (CDC) hand hygiene guidelines or the current World Health Organization (WHO) hand hygiene guidelines	3.80	High Extent
	12. Implement evidence-based practices to prevent HCAs due to multidrug-resistant organisms in acute care hospitals	3.91	High Extent
	13. Implement evidence-based practices to prevent central line-associated bloodstream infections	3.75	High Extent
	14. Implement evidence-based practices for preventing surgical site infections	3.85	High Extent
PSG 6	15. Conduct a risk assessment that identifies specific patient characteristics and environmental features that may increase or decrease the risk for suicide.	3.73	High Extent
	16. Address the patient's immediate safety needs and most appropriate setting for treatment.	3.95	High Extent
	17. Provision of suicide prevention information to the patient and his/her family.	3.62	High Extent
PSG 7	18. Conduct a pre-procedure verification process	4.44	High Extent
	19. Mark the procedure site	3.82	High Extent
	20. Time-out is performed before the procedure	4.34	High Extent

### Overall Summary of PSGs Level of Attainment and Significant Differences

Table 3 shows the summary of the average mean and significant difference in the level of attainment of patient safety goals. All the indicators identified were considered strengths on the level of attainment among the tertiary hospitals ( $M > 3.50$ ). On the other hand, PSGs Nos. 3 and 4 with  $p$  values of 0.02 and 0.00 respectively have significant differences.

Table 3. Significant differences in the assessment of PSGs level of attainment

PSGs	F	$p$	F
PSG No. 1	1.59	0.21	3.06
PSG No. 2	0.86	0.42	3.06
PSG No. 3	3.91	0.02	3.06
PSG No. 4	7.37	0.00	3.06
PSG No. 5	0.40	0.68	3.98

PSGs	F	<i>p-value</i>	F
PSG No. 6	2.81	0.06	3.06
PSG No. 7	0.22	0.81	3.21

*p* < 0.05

## DISCUSSION

The Institute of Medicine (IOM) detailed the multifaceted dimensions of systems and human errors leading to patient harm (Donaldson et al., 2000). The identification of patient harm facilitates the development of holistic perspective from the identified causes to the sustaining capacity of the organizations to embody patient safety core principles. Donaldson et al. (2000) posited a sizeable corpus of medical errors as a primary cause of death and injury among individuals and the direct and indirect financial losses due to preventable adverse events. Thus, to ensure a ‘no harm’ environment, patient safety has become a shared responsibility between and among the healthcare providers, patients, and other members of the organization.

The World Health Assembly in 2002 provided venues for many countries to address the status of patient safety provision. As such, in the Philippines through the Department of Health responded to this clamor by issuing the AO No. 2008-0023 to ensure that patient safety is integrated into the system of all the hospitals in various settings. Hence, many hospitals in the country have been mandated to develop a mechanism of the audit through quality improvement initiatives anchored in patient safety. However, there is no available existing information about these hospitals.

Based on the findings of this study, selected tertiary hospitals obtained a high level of attainment in PSG that comprised of seven goals. PSG No. 1 aims at improving the accuracy of patient identification that also accounts for the use at least two patient identifiers when providing care, treatment and the elimination of transfusion errors related to patient misidentification. Patient identification is the most basic but essential part of the process in the prevention of patient harm. Patient identifiers vary among institutions, but the most common being utilized are the patient’s ID band and the case number. However, Lemos and da Silva Cunha (2017) observed that the protocol of identification of patients is practiced with failures among nurses and an institutional challenge. Another issue that concerns patient safety is incidents during medications associated with misidentifications occur, and wrong-patient (Härkänen, Tiainen, & Haatainen, 2018) Medication errors are most likely prevented when all other rights of medication administration are observed (Chinn, 2014; Marquard et al., 2011). Apart from this, nurses need to follow the standard of counterchecking the blood component with another qualified individual before administration (Alter & Klein, 2008; Chan et al., 2004; Chinn, 2014). In the advent of technology, the use of facial recognition (McCleary, 2018), electronic wristband (De Souza Macedo et al., 2017) automated patient identification and record matching (Fernandes, Burke, & O’Connor, 2017) could offer a solution to prevent this further harm to patients.

PSG No. 2 aims to improve the effectiveness of communication among caregivers which can be achieved using well-understood daily patient care goal alignment, shared vision, and multidisciplinary involvement (Ainsworth, Pamplin, Rn, Linfoot, & Chung,

2013). Despite patient care varies on how it is delivered, or the differing perceptions among the members of the healthcare, communication becomes a mechanism towards openness and acceptance (Ainsworth et al., 2013). Furthermore, through open communication, it is easier to abrogate the feeling of uneasiness or fear in reporting critical results of tests and diagnostic procedures on a timely basis, managing the critical results of tests and diagnostic procedures, and using a two-person verification process. Any critical results or panic values require prompt treatment, rapid communication and intervention to avoid cumbersome effects (Fracica, Lafeer, Minnich, & Fabius, 2006; Singh & Vij, 2010).

PSG No. 3 aims to improve the safety in using medications along with using the label in all the medications, medication containers, and other solutions on and off the sterile field in perioperative and other procedural settings, reduce the likelihood of patient harm associated with the use of anticoagulant therapy, and maintain and communicate accurate patient medication information. Nurses are responsible for identifying not only the patients themselves but also medications and supplies belong to them. In this manner, ownership of the materials used in the care of the patients is secured. It implied that cross contaminations could be prevented. Nurses strictly observe the right in medication administration to check for the expiration date and label the medications. A non-punitive environment as suggested by Fracica et al. (2006) could help the organization in improving safety measures about errors and near misses. Another action is the computerized physician order entry (CPOE) that provides a real-time decision support input about drug selection, and eliminate problems of miscommunication (Fracica et al., 2006).

PSG No. 4 aims to improve the safety of clinical alarm systems. Safety is one of the priorities of the hospital where patients seek health services accompanied by the trust that they will not be harmed during treatment. Such patient trust can be strengthened using providing any mechanism such as clinical alarm system to anticipate foreseeable problems in patient care (Mascioli, 2016; Sue & Marjorie, 2013). Sue and Marjorie (2013) further asserted the use of daily electrocardiogram electrode changes, proper skin preparation, education, and customization of alarm parameters offer safety environment. On the contrary, clinician motivation, self-discipline and commitment have been coined as potential causes of alarm fatigue (Rayo & Moffatt-Bruce, 2015) that can be addressed through the clinical alarm management (CAM). This CAM adopts a pragmatic and rigorous approach to diagnose and treat the alarm-related issues (Rayo & Moffatt-Bruce, 2015)

PSG No. 5 aims to reduce the risk of HCAs through compliance with either the CDC or the WHO hand hygiene guidelines. There is also a need to implement evidence-based practices to prevent healthcare-associated infections due to multidrug-resistant organisms in acute care hospitals and for preventing surgical site infections, and indwelling catheter-associated urinary tract infections (CAUTI). A practical implementation of policies based on the standards and regulatory requirements is needed as these changes over time and require the institutions to update their standard operating procedures. Steinberg et al. (2013) opined that hospital environment has the sole responsibility of preventing disease-causing, or pathogenic, microorganisms. If



HCAIs continue to proliferate, it would be a financial burden to healthcare organizations (Umscheid et al., 2011).

PSG No. 6 focuses on identifying the patients at risk of suicide. There are existing screening, referral systems, and appropriate settings for treatment among the institutions for a patient who is at risk for suicide through. Provision of suicide prevention information to the patient and family should be improved as well as the information needed to be either oral or written forms. The Institute of Medicine in 1999 (cited in Donaldson et al., 2000) advocated the development and implementation of patient safety programs based on safety principles to prevent any harms to patients, significant others, and healthcare team members. Through early identification of the associated factors and provision of information (e.g., crisis hotlines) to individuals and family members (Robst, 2015) risk can be prevented.

PSG No. 7 aims to prevent mistakes in surgery through the conduct of a preprocedural verification process, marking the procedure site, and time-out before the procedure. Patient misidentification can contribute to medication, surgical and charting errors (Campbell et al., 2015), thus, a strict compliance to proper patient identification prevent wrong-site surgery that “encompasses surgery performed on the wrong side or site of the body, the wrong surgical procedure carried out, and surgery performed on the wrong patient” (Mulloy & Hughes, 2008). Tichanow (2016) added that errors during surgery arise from a breakdown of communication between members of a multidisciplinary team or ineffective teamwork. Seiden and Barach (2006) revealed 5,940 cases of wrong-site surgery in 13 years accounted for 2,217 wrong side surgical procedures and 3,723 wrong-treatment/wrong procedure errors. This appalling issue prompted the World Health Organization (2009) to release the WHO Surgical Safety Checklist for use in any operating theatre environment for the relevant clinical teams to improve the safety of surgery by reducing deaths and complications.

The PSG level of attainment varied from one hospital to another that signifies variations in the implementation of patient safety culture. Though institutions have the same standards in ensuring safe and quality nursing care which are contributory factors of patient safety, there are variations on how it is observed and practiced. Although significant differences are noted, reinforcement of patient safety guidelines and protocols should be the topmost priority which requires involvement, commitment, and collaboration. Various studies conducted showing the effects of PSG implementation on patient, organization, and community outcomes that would further need validation within the parlance of nursing service management as one of this study’s future direction (Figure 1).

## **CONCLUSION**

The selected hospitals in this study indicate a high level of attainment about patient safety goals. Nurses from different areas although shared different views and practices, patient safety remains at the core of service delivery. However, patients, family members, and other health allied practitioners should also be involved in its program implementation, monitoring, and evaluation. The hospital should further enhance the knowledge, skills, and attitudes towards a sustained patient safety culture through

continuing education programs, benchmarking, institutionalization, and accreditation. Many efforts have been made to intensify the Department of Health’s response to the patient safety administrative order, and yet there is dearth of evidence in evaluating the attainment of PSG within the Philippine context. Despite a limited number of hospitals included in this preliminary study, it offers preliminary findings and a new direction on how nurses viewed the patient safety goals in their current workplaces. With this, future studies will be conducted using a multidisciplinary inclusion. Further, the areas of nursing management will also be performed to explore how those areas can influence the sustenance of PSG implementation.

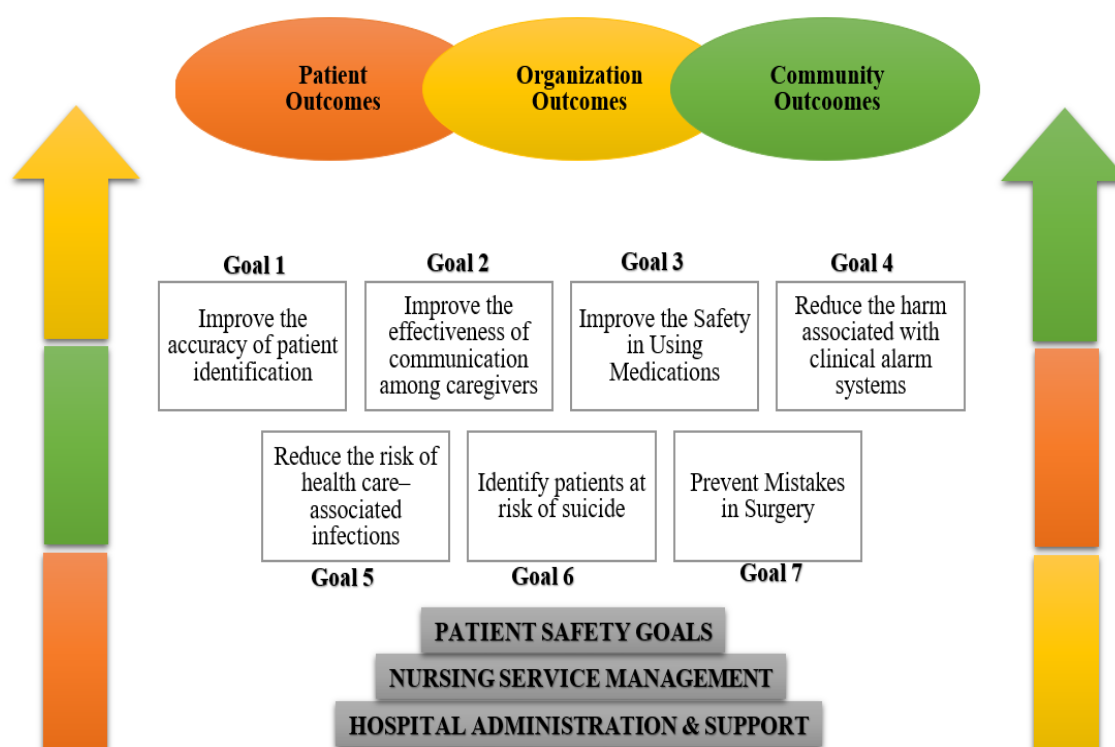


Figure 1. Future direction for PSG implementation in the Philippines

**REFERENCES**

Ainsworth, C. R., Pamplin, J. C., Rn, D. A. A., Linfoot, J. A., & Chung, K. K. (2013). A bedside communication tool did not improve the alignment of a multidisciplinary team's goals for intensive care unit patients. *Journal of Critical Care*, 28(1), 112.e117-112.e113. doi: <http://dx.doi.org/10.1016/j.jcrc.2012.09.006>

Alter, H. J., & Klein, H. G. (2008). The hazards of blood transfusion in historical perspective. *Blood*, 112(7), 2617-2626.

Campbell, K., Muniak, A., Rothwell, S., Dempster, L., Per, J., & Barr, K. (2015). Improving quality and safety through positive patient identification. *Healthcare Quarterly (Toronto, Ont.)*, 18(3), 56-60.

- Chan, J., Chu, R., Young, B., Chan, F., Chow, C., Pang, W., . . . Lau, J. (2004). Use of an electronic barcode system for patient identification during blood transfusion: 3-year experience in a regional hospital. *Hong Kong Medical Journal*, 10(3), 166-171.
- Chinn, S. (2014). Avoiding medical errors: Joint commission's 2013 national patient safety goals. *Podiatry Management*, 33(7), 127-132.
- De Souza Macedo, M. C., Ferreira De Almeida, L., Guimarães Assad, L., Gonçalves Rocha, R., Rangel Ribeiro, G. D. S., & Vasconcelos Pereira, L. M. (2017). Patient identification through electronic wristband in an adult general intensive care unit. *Revista de Enfermagem Referência*, 4(13), 63-70. doi:10.12707/RIV16087
- Department of Health. (2008). *National policy on patient health: Administrative order no. 2008 - 0023*. Manila, Philippines.
- Donaldson, M. S., Corrigan, J. M., & Kohn, L. T. (2000). *To err is human: Building a safer health system* (Vol. 6). Washington, D.C: National Academies Press.
- Fernandes, L., Burke, J., & O'Connor, M. (2017). Applying innovation to the patient identification challenge. *Journal of AHIMA*, 88(8), 26-29.
- Fracica, P., Lafeer, M., Minnich, M., & Fabius, R. (2006). Patient safety checklist: keys to successful implementation. *Physician Executive*, 32(4), 46-53.
- Gill, C. J., Mantaring, J. B., Macleod, W. B., Mendoza, M., Mendoza, S., Huskins, W. C., . . . Hamer, D. H. (2009). Impact of enhanced infection control at 2 neonatal intensive care units in the Philippines. *Clinical Infectious Diseases*, 48(1), 13-21.
- Härkänen, M., Tiainen, M., & Haatainen, K. (2018). Wrong-patient incidents during medication administrations. *Journal of Clinical Nursing*, 27(3/4), 715-724. doi:10.1111/jocn.14021
- Harrison, R., Cohen, A. W. S., & Walton, M. (2015). Patient safety and quality of care in developing countries in Southeast Asia: a systematic literature review. *International Journal for Quality in Health Care*, 27(4), 240-254. doi:10.1093/intqhc/mzv041
- Joint Commission International. (2007). *Joint commission international accreditation standards for hospitals*. Oakbrook Terrace, IL: Joint Commission Resources.
- Lemos, C. S., & da Silva Cunha, K. C. (2017). The use of patient identification in a hospital unit. *Journal of Nursing UFPE/Revista de Enfermagem UFPE*, 11(1), 130-139. doi:10.5205/reuol.9978-88449-6-1101201716
- Marjadi, B., & McLaws, M.-L. (2010). Rural Indonesian health care workers' constructs of infection prevention and control knowledge. *American Journal of Infection Control*, 38(5), 399-403.
- Marquard, J. L., Henneman, P. L., He, Z., Jo, J., Fisher, D. L., & Henneman, E. A. (2011). Nurses' behaviors and visual scanning patterns may reduce patient identification errors. *Journal of Experimental Psychology: Applied*, 17(3), 247.
- Mascioli, S. (2016). Spotlight on the 2016 national patient safety goals for hospitals. *Nursing*, 46(5), 52-55. doi:10.1097/01.NURSE.0000482262.78767.19
- McCleary, V. (2018). Smile, you're on facial recognition: Developing technology could solve patient identification issues. *Journal of AHIMA*, 89(3), 20-23.
- Mulloy, D. F., & Hughes, R. G. (2008). Wrong-Site Surgery: A Preventable Medical Error. In R. G. Hughes (Ed.), *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville, MD: Agency for Healthcare Research and Quality.

- Navoa-Ng, J. A., Berba, R., Galapia, Y. A., Rosenthal, V. D., Villanueva, V. D., Tolentino, M. C. V., . . . Mantaring, J. B. V. (2011). Device-associated infections rates in adult, pediatric, and neonatal intensive care units of hospitals in the Philippines: International nosocomial infection control consortium (INICC) findings. *American Journal of Infection Control, 39*(7), 548-554.
- Nguyen, D., MacLeod, W. B., Phung, D. C., Cong, Q. T., Nguyen, V. H., & Hamer, D. H. (2001). Incidence and predictors of surgical-site infections in Vietnam. *Infection Control & Hospital Epidemiology, 22*(8), 485-492.
- Rayo, M. F., & Moffatt-Bruce, S. D. (2015). Alarm system management: evidence-based guidance encouraging direct measurement of informativeness to improve alarm response. *BMJ Quality & Safety, 24*(4), 282.
- Robst, J. (2015). Suicide attempts after emergency room visits: the effect of patient safety goals. *The Psychiatric Quarterly, 86*(4), 497-504. doi:10.1007/s11126-015-9345-7
- Rosenthal, V. D., Maki, D. G., Mehta, A., Álvarez-Moreno, C., Leblebicioglu, H., Higuera, F., . . . Dueñas, L. (2008). International nosocomial infection control consortium report, data summary for 2002-2007, issued January 2008. *American Journal of Infection Control, 36*(9), 627-637.
- Rosenthal, V. D., Richtmann, R., Singh, S., Apisarnthanarak, A., Kübler, A., Viet-Hung, N., . . . Gikas, A. (2013). Surgical site infections, international nosocomial infection control consortium (INICC) report, data summary of 30 countries, 2005–2010. *Infection Control & Hospital Epidemiology, 34*(6), 597-604.
- Seiden, S. C., & Barach, P. (2006). Wrong-side/wrong-site, wrong-procedure, and wrong-patient adverse events: are they preventable? *Archives of surgery, 141*(9), 931-939.
- Singh, H., & Vij, M. S. (2010). Eight recommendations for policies for communicating abnormal test results. *Joint Commission Journal on Quality and Patient Safety, 36*(5), 226-232.
- Steinberg, J. P., Denham, M. E., Zimring, C., Kasali, A., Hall, K. K., & Jacob, J. T. (2013). The role of the hospital environment in the prevention of healthcare-associated infections by contact transmission. *HERD : Health Environments Research & Design Journal, 7*(1\_suppl), 46-73.
- Sue, S., & Marjorie, F. (2013). Alarm fatigue: a patient safety concern. *AACN Advanced Critical Care*(4), 378. doi:10.1097/NCI.0b013e3182a903f9
- Tichanow, S. (2016). Wrong site surgery: a critical incident analysis of a near miss. *Journal of Perioperative Practice, 26*(1-2), 11-15. doi:10.1177/1750458916026001-202
- Umscheid, C. A., Mitchell, M. D., Doshi, J. A., Agarwal, R., Williams, K., & Brennan, P. J. (2011). Estimating the proportion of healthcare-associated infections that are reasonably preventable and the related mortality and costs. *Infection Control & Hospital Epidemiology, 32*(2), 101-114.
- World Health Organization. (2009). *Who surgical safety checklist*. Retrieved from <http://www.nrls.npsa.nhs.uk/resources/?entryid45=59860>
- World Health Organization. (2018). *10 facts on patient safety*. Retrieved from [http://www.who.int/features/factfiles/patient\\_safety/en/](http://www.who.int/features/factfiles/patient_safety/en/)