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# 2016 National Patient Safety Goals

## GOAL 1:

Improve the accuracy of patient identification.

**NPSG.01.01.01** Use at least two patient identifiers when providing care, treatment, and services

**NPSG.01.03.01:** Eliminate transfusion errors related to patient misidentification



## GOAL 7:

Reduce the risk of health care associated Infections.

**NPSG.07.01.01:** Comply with either the current Centers for Disease Control and Prevention (CDC) or the current World Health Organization (WHO) hand hygiene guidelines.



**NPSG.07.03.01:** Implement evidence-based practices to prevent health care associated infections due to multi-drug resistant organisms in acute care hospitals.

**NPSG.07.04.01:** Implement evidence-based practices to prevent central line associated bloodstream infections.

**NPSG.07.05.01:** Implement evidence-based practices for preventing surgical site infection

**NPSG.07.06.01:** Implement evidence-based practices to prevent indwelling catheter associated urinary tract infections (CAUTI)



## GOAL 2:

Improve the effectiveness of communication among caregivers.

**NPSG.02.03.01:** Report critical results of tests and diagnostic procedures on a timely basis.



## GOAL 3:

Improve the safety of using medications.

**NPSG.03.04.01:** Label all medications, medication containers, and other solutions on/off the sterile field in perioperative and other procedural settings.

**NPSG.03.05.01:** Reduce the likelihood of patient harm associated with anticoagulant therapy use.

**NPSG.03.06.01:** Maintain and communicate accurate patient medication information



## GOAL 15:

The hospital identifies safety risks inherent in its patient population.

**NPSG.15.01.01:** Identify patients at risk for suicide

## GOAL 6:

Reduce the harm associated with clinical alarm systems.

**NPSG.06.01.01:** Improve the safety of clinical alarm systems.



## UNIVERSAL PROTOCOL:

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**UP.01.01.01:** Conduct a pre-procedure verification process.

**UP.01.02.01:** Mark the procedure site.

**UP.01.03.01:** A time-out is performed before the procedure

# Image Gently, Image Wisely, and Choosing Wisely: Initiatives to Reduce Radiation Dose in Imaging and Improve Quality and Patient Safety at Harlem Hospital with the Goal to Image Safely

Leszek Pisinski, MD; Adil Omer, MD\*; Haneen Abdel-Dayem, MD; Roberta Locko, MD, FACR, FACNM, CHCQM, CMQ, CPPS

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## ABSTRACT

**Introduction:** Radiation dose reduction in diagnostic imaging is crucial to patient quality and safety. Harlem Hospital has committed to actively participate in several national initiatives which include Image Gently focused on dose reduction in children, Image Wisely focused on radiation dose reduction in adults, and Choosing Wisely focused on the appropriate utilization of imaging procedures.

**Methods:** A retrospective comparative chart review was conducted assessing the impact of national initiatives implemented at Harlem Hospital (Image Gently, Image Wisely, and Choosing Wisely) on radiation dose reduction over a five-year period. The comparison was attained by measuring the volume computed tomography dose index mean values from children and adult CT scans and the volume of non-ionizing studies (for example, ultrasound). These values were collected from the year 2009 (before the implementation of changes) to 2014 (the fifth year following the start of implemented changes) were then compared. Additionally, compliance of physicians with ACR recommendations (American College of Radiology Appropriateness Criteria-ACRAC) regarding appropriate diagnostic imaging in five predetermined conditions were measured and compared for the years 2012, 2013, and 2014 which is part of the “Choosing Wisely” initiative.

**Results:** Image Gently: Following implementation five years later the adjusted CTDI volume in pediatric abdominal CT had reduction of 63.97%, 59.90%, and 40.47% for patients weight 10-30 kg, 30-50 kg, and 50-70 kg, respectively. For young adults there was a 31.83% reduction of the CTDI volume. Also there was a 125% increase in utilized abdominal ultrasound in the cases of patients presenting with abdominal pain. Image Wisely: 64 slice CT installation demonstrated marked reduction of CTDI volume in the adult population. Choosing Wisely: changes were observed in practice patterns, however more work needs to be accomplished in this domain.

**Conclusion:** Harlem Hospital was able to achieve significant success in reducing radiation exposure to its different patient populations by following national initiatives.

**Key words:** Image Gently; Image Wisely; Choosing Wisely; Radiation Dose Reduction; Harlem Hospital; Quality Improvement; Patient Safety

## INTRODUCTION

Harlem Hospital goals are to reduce patient radiation exposure and improve quality and patient safety through the evaluation and improvement of imaging practices for the pediatric and adult populations and to implement best practices throughout the institution by reinforcing American College of Radiology (ACR)

and other recommendations achieved through participation in the Image Gently, Image Wisely and Choosing Wisely campaigns. These campaigns mainly focused on regulating computed tomography (CT) due to its major role in radiation exposure and due to the attention that CT dose has received in the national media.

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## METHODS

Harlem Hospital started the process of transforming the radiology department to ensure the highest levels of patient safety and quality by implementing Image Gently, Image Wisely and Choosing Wisely recommendations. Pledges for the Image



Gently and Image Wisely campaigns were taken upon the release of these campaigns. The Image Gently initiative focused on reducing radiation doses in pediatric population. The Image Wisely initiative directed efforts to reduce radiation in the adult population. Finally the Choosing Wisely initiative focused on avoiding unnecessary radiation exposure by following evidence-based ACR Appropriateness Criteria, regarding five common scenarios where radiological imaging could be avoided or replaced with an alternative form of imaging (US/MRI).

This is a retrospective chart review approved by institutional review board with a waiver to obtain a report by following the national initiatives “Image Gently”, “Image Wisely”, and “Choosing Wisely” recommendations. The data collection was limited to the use of the electronic medical records (EMR) which was reviewed for patient specific data, then transferred to an excel 2010 spreadsheet. The data collected to measure “Image Gently” and “Image Wisely” impact included patient age, weight, imaging modality, the volume computed tomography dose index (CTDI vol), and the indication for each study. These parameters were taken during two periods of time for the purpose of this comparison. The first period was 2009, one year preceding the implementation of imaging protocol changes. The second period was the fifth year after implementation of changes: 2014. The CTDI vol mean value was mainly used for the comparison.

The inclusion criteria for “Image Gently” encompassed all pediatric patients who underwent abdominal CT scan during the two periods of time determined. As for “Image Wisely”, the inclusion criteria involved young adults who underwent head CT scans and abdominal CT scans during the same periods of time. Moreover, patients with presentations potentially indicating the use of non-ionizing (MRI/US) studies such as abdominal pain in a child or female in the reproductive age suspected to be due to appendicitis/intussusception were included to determine the frequency of utilization of non-ionizing studies (US/MRI) instead of ionizing studies (CT scans); this inclusion criterion is part of both “Image Gently” and “Image Wisely” measurement.

The “Choosing Wisely” initiative progress was tracked throughout 2012, 2013, and 2014 to evaluate physicians’ compliance with recommendations which were delivered through frequent educational seminars. The data collected for that purpose included: first, the number of patients who presented with headache and whether or not imaging was utilized and, if so, which modality used (head CT scan or head MRI). Second, the number of patients who presented with a condition suspected for pulmonary embolism and whether or not they received a chest x-ray. Third, the number of pre-operative patients who routinely had a chest x-ray and how many did not. Fourth, the number of patients with confirmed appendicitis who were radiologically

imaged and the type of imaging (CT scan or Ultrasound) and how many were not imaged. The inclusion criteria for “Choosing Wisely” initiative included the following: headache presentation, patients with chest pain suspected for pulmonary embolism, confirmed appendicitis in a child, pre-operative patients, and patients with adnexal mass. All those conditions were measured during the years 2012, 2013, and 2014.

## RESULTS

The comparison of weight-adjusted CTDI vol in pediatric abdominal CT demonstrated the following five-year results: for 10-30 kg patients a 63.97% dose reduction, for 30-50 kg patients a 59.90% dose reduction, and for 50-70 kg patients a 40.47% dose reduction (Image Gently). There was insufficient data for patients weighting less than 10 kg (Figure 1). The comparison of CTDI vol for head CT in young adults demonstrated a 31.83% five-year dose reduction (Image Wisely) (Figure 2A). There was a 125% increase in utilization of abdominal ultrasound (n=97 in 2014 vs. n=43 in 2009) in pediatric patients referred for abdominal pain, r/o intussusception or r/o appendicitis (Image Gently + Image Wisely) (Figure 2B).

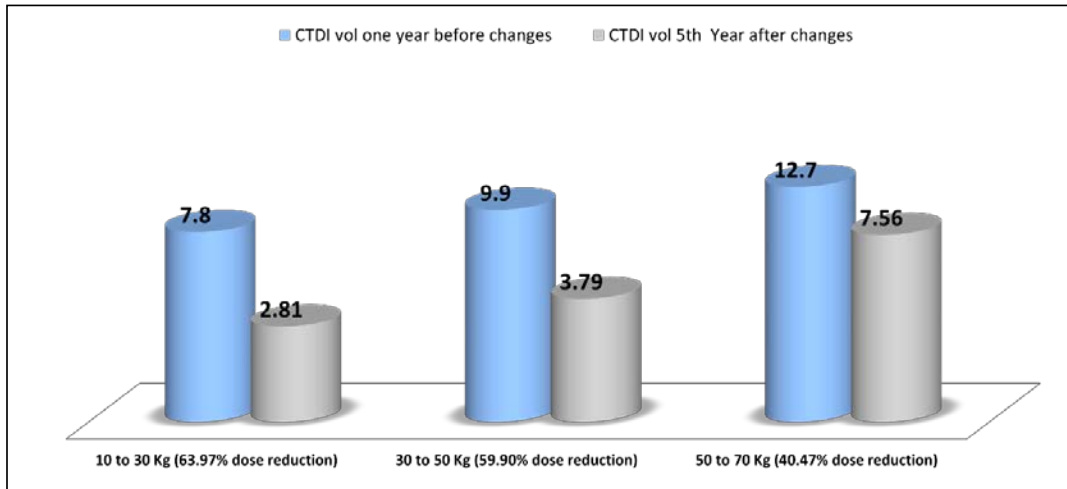
Following the 64-slice CT installation during Image Wisely implementation, there was a marked reduction in CTDI vol with a decrease from 69.2 to 59.6 for head CT, 23.3 to 22.3 for C-spine CT, 17.6 to 14.2 for abdominal CT, and from 15.5 to 7.4 for chest CT and Chest HR CT (Image Wisely) (Figure 3).

The analysis of Choosing Wisely efforts demonstrated slight changes of practice patterns when addressing four of the five studies that were selected by the initiative with variability in a predominantly appropriate response over the selected three-year period. We were not able to assess the approach to adnexal cysts due to the lack of sufficient data (Figure 4).

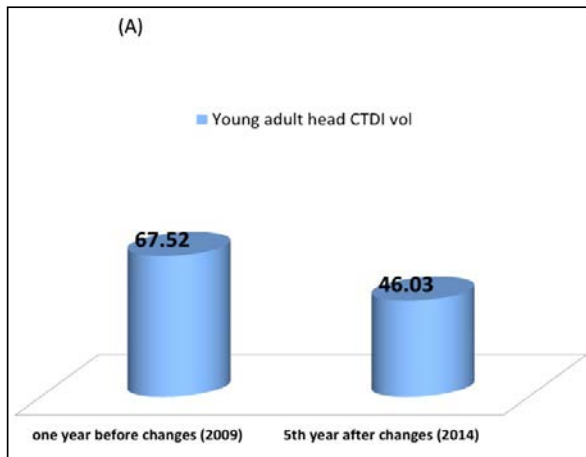
## DISCUSSION

Computed Tomography (CT) received exceptional attention from these campaigns focused on a reduction of radiation dose in an attempt to promote increased quality and patient safety due to CT’s significant role in increasing the population radiation dose exposure. CT scans encompasses 4% of all medical radiological studies while contributing 40% of the total population diagnostic radiological exposure [1, 2]. A cause of concern is the increased lifetime risk of developing fatal cancer after exposure to radiation from CT scans, more in the pediatric population than adult population [3]. Despite the enhanced vulnerability of children, there is an apparent increase in the frequency of studies and doses of exposure from CT scans. The frequency of radiological exposure to children has increased dramatically owing to the development of helical CT and the advances it offers which

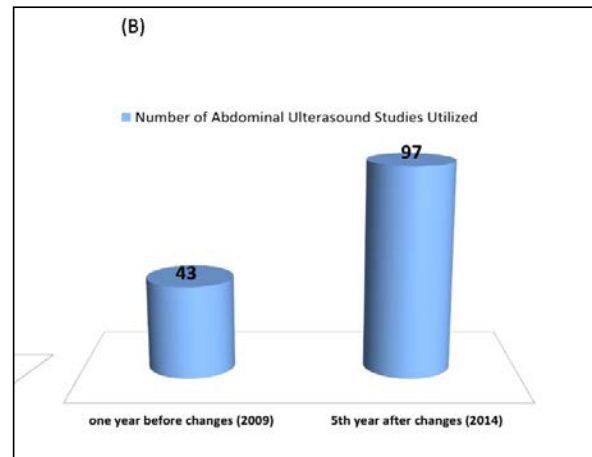
**Figure 1. CTDI volume comparing one year before baseline (2009) and the fifth year after baseline (2014)**



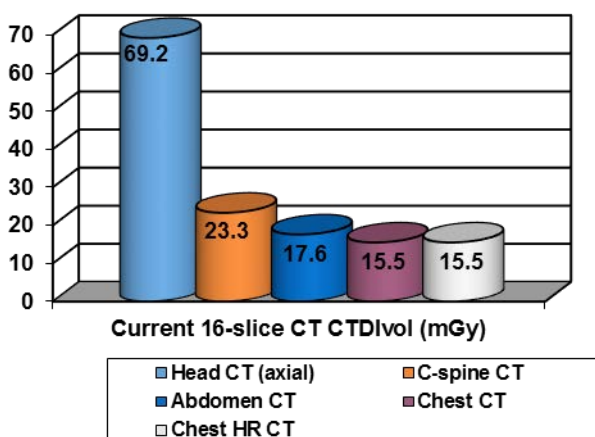
**Figure 2. (A) Young adult head average CTDI vol comparing one year before baseline (2009) and the fifth year after baseline (2014)**



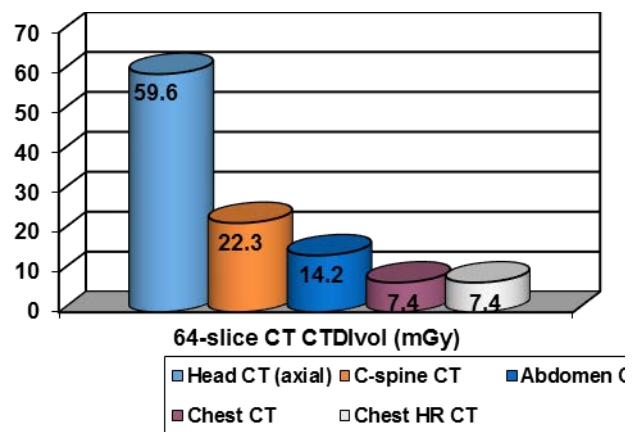
**Figure 2. (B) Abdominal Ultrasound Utilization comparing one year before baseline (2009) and the fifth year after baseline (2014)**



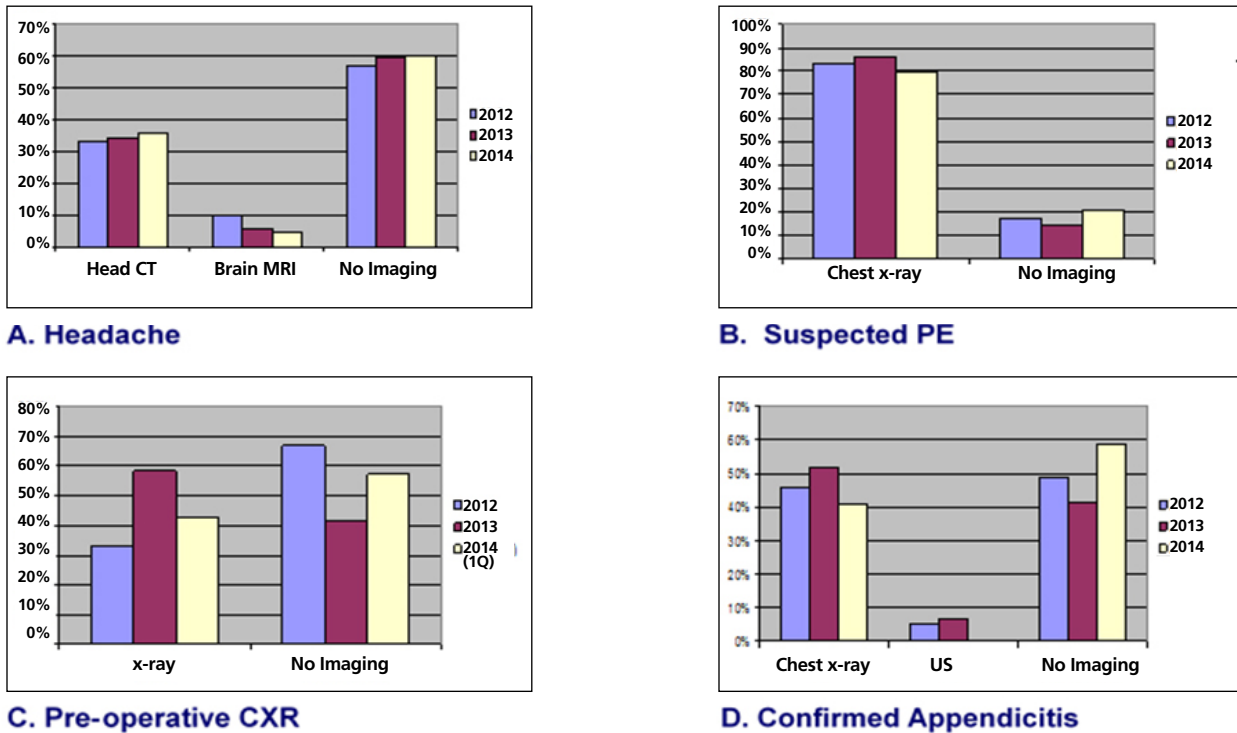
**Figure 3. (A) Efforts by Harlem Hospital to reduce radiation dose in adult patients. Shows CTDI volume when 16-slice CT scan used**



**Figure 3. (B) Efforts by Harlem Hospital to reduce radiation dose in adult patients. Shows CTDI volume following 64-slice CT installation**



**Figure 4.** Demonstrate the analysis of imaging utilization at Harlem Hospital for four of the five imaging studies which were selected by the ACR as being overutilized: part of the ACR efforts to participate in Choosing Wisely initiative throughout the years 2012, 2013, and 2014. These results show variable response which indicates that more work is needed in this domain, and this initiative is still underway.



range from increased speed that reduced the need for sedation to the wide range of newer CT applications used in children [3]. Additionally, excess radiation dose to children is caused by the use of adult CT exposure parameters instead of adjusting them to fit respective age and weight of children [4]. These adjustments are cost free but are often not considered regardless of their dramatic impact on radiation dose reduction in children mainly due to the lack of familiarity with pediatric CT protocols [5, 6].

The main adjustable parameters in helical CT include tube current, kilovoltage, collimation, and pitch [5]. The most effective parameter in terms of dose reduction includes tube current and pitch. The tube current when adjusted to child age and size can potentially reduce radiation exposure by 5-20%. When other parameters are held constant, a 50% reduction in tube current could lead to 50% radiation dose reduction. On the other hand, the pitch could reduce radiation exposure by 50% if doubled due to the reduced time required to scan the target area by half. Both of these modifications can be achieved without losing any diagnostic information [1]. Those issues and suggested solutions were adopted and addressed by the various initiatives including Image Gently, Image Wisely, and Choosing Wisely which result in reduced radiation exposure.

Image Gently is an educational and awareness campaign led

by the Alliance for Radiation Safety in Pediatric Imaging (Table 1) with the aim of reducing radiation exposure while providing a high quality CT scan for pediatric patients. For this purpose, four simple recommendations were suggested. First, reduce radiation amount used by comparing your baseline radiation dose to that of the ACR standard and adjust accordingly, followed by implementing protocols provided for children on the Image Gently Website ([www.imagegently.org](http://www.imagegently.org)). Second, scan only when unavoidable by making sure the benefit outweighs the risk. Third, only scan the area of interest. Finally, avoid multiphase scanning “scan once” because it is not always necessary in children while it doubles or triples the radiation dose [6, 7].

Image Wisely was formed by a joint task force (Table 2) with the goal to protect adults against excessive diagnostic radiation exposure. The mission was to eradicate unnecessary imaging examinations and to reduce radiation doses in necessary examinations by raising awareness through easily accessible educational materials which target imaging professionals, referring practitioners and patients. This program included three levels of commitment: first achieved by taking the Image Wisely pledge; second achieved by obtaining an accreditation which is based on the ACR accreditation programs through demonstration of attention to radiation dose. The third level of commitment

**Table 1. Organizations that formed the Alliance for Radiation Safety in Pediatric Imaging “Image Gently” [10, 11]**

Founding Organizations	Affiliate Alliance Organizations
The Society for Pediatric Radiology	American Academy of Pediatrics
American College of Radiology	American Osteopathic College of Radiology
American Society of Radiologic Technologists	American Registry of Radiologic Technologists
American Association of Physicists in Medicine	American Roentgen Ray Society
	Association of University Radiologists
	Conference of Radiation Control Program Directors
	National Council on Radiation Protection and Measurements
	Radiological Society of North America
	Society of Computed Body Tomography and Magnetic Resonance

**Table 2. The joint task force that formed Image Wisely campaign [8]**

Original Founding Organizations	Newly Included Organizations During Expansion
American College of Radiology (ACR)	American Association of Physicists in Medicine (AAPM)
The Radiological Society of North America (RSNA)	The American Society of Radiologic Technologists (ASRT)

includes participation in a national dose registry allowing comparison of CT doses to national standards [8].

Choosing Wisely, an initiative of the American Board of Internal Medicine (ABIM) Foundation, brought leading national medical organizations together to participate including the American College of Radiology (ACR). Each identified five tests or procedures that were thought to be overused. At least one item of the five was an imaging study used by the majority of participating organizations. All five items identified by ACR were imaging studies [9,10] which included imaging for uncomplicated headache absent specific risk factors for structural disease or injury, imaging for suspected pulmonary embolism (PE) without moderate or high pre-test probability of PE, pre-operative chest x-rays for ambulatory patients with unremarkable history and physical exam, computed tomography for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option, and follow-up imaging for adnexal (reproductive tract) cysts five cm or less in diameter in reproductive-age group women [11,12,13,14].

In conclusion, Harlem Hospital has had significant success in reducing patient radiation exposure during the last five years following the implementation of the discussed national initiatives. We are committed to join future national campaigns and implement new imaging recommendations and technological developments for our patients to always “**Image Safely**”. From that prospective, other institutions are encouraged to follow our footsteps in implementing the recommendations of national radiation safety initiatives so as to decrease unnecessary radiation exposure associated with medical imaging.

#### **ACKNOWLEDGEMENT**

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# Alarm Fatigue: Don't Silence This Alarm about Patient Safety!

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## ABSTRACT

**Introduction:** For the last five years, alarm hazards continue to be one of the top ten health technology hazard. Alarm fatigue is the most common type of alarm hazard. It is a slow or absent response to alarms by staff members. In our study, we focused on telemetry alarms and tried to categorize all alarms noted over two months of period into three groups – true actionable, true non-actionable and false alarms. Aim was to assess need for change in policy to allow room for personalization of pre-set alarm thresholds according to patient profiles compared to one fixed set for all the patients.

**Methods:** The study was carried out at a step-down telemetry medicine unit. The study was limited to alarms generated by cardio-respiratory monitor only. All strips printed with each alarm were obtained and evaluated by the attending physician. Data collection occurred over period of 2 months. Alarms were categorized into three groups – true actionable, true non-actionable and False alarms

**Results:** Total of 1627 alarm strips were collected from cardio-respiratory monitor. Most of the alarms were noted to be false (n=1306, 80.3%). Out of remaining 19.7% alarms; 8.7% (n=142) were diagnostically and therapeutically relevant requiring urgent medical attention but 11% (n=179) were although diagnostically correct but did not require any medical intervention.

**Conclusion:** A comprehensive hospital policy for area-specific alarm configuration must be devised and should include : Indications for use of specific alarms, default alarm threshold settings standardized as per specific areas of care, authority to change alarm settings according to individual patient needs and to reactivate default settings for the new patient, default volume settings and policy regarding adjusting volume as per categorized priority levels, frequent calibration of sensors and to check efficiency of alarms, training and education of staff-members about appropriate procedures e.g. proper skin preparation and electrode lead placement, creating awareness about hospital alarm configuration policy and regular revision of policy according to feedback.

**Key words:** Alarm Fatigue; Patient Safety; Cardiac Monitors; Alarm Hazard

## INTRODUCTION

Alarms are meant to improve patient safety by alerting staff members about variation from defined safe limits of parameters. But alarm hazards continues to be one of top 10 health technology hazards for last 5 years [15]. It was Joint commission which issued a sentinel event alert for medical device alarm safety in 2013 [16]. It also cited 98 alarm-related events which included 80 deaths. This translated into making alarm safety as one of the national patient safety goal in 2014.

One of the most common issues related to alarm hazards is alarm fatigue. Alarm fatigue is a phenomenon of slow or absent response to alarms by staff-members when they have been overwhelmed or distracted or de-sensitized by continuous activation of large numbers of alarms [2, 15]. A national survey of 1327 members consisting mostly of registered nurses working in acute care hospitals identified 81% of alarms as false alarms and 77% of members blamed these false alarms for disrupting patient care [10].

Alarms can be divided into three categories – (a) Actionable; true alarms which require urgent medical intervention; (b) Non-actionable; true alarms but does not need urgent medical intervention; (c) False alarms. A multicentric study in 1999 had shown alarm sensitivity of 97%, specificity of 58% and positive predictive value of only 27% [2]. But now prevalence of alarm use has markedly increased compared to actual need resulting in expected

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decrease in positive predictive value and increase false-positives.

In our study, we focused on telemetry alarms only and tried to categorize all alarms noted over 2 months of period into above mentioned groups – true actionable, true non-actionable and false alarms. Aim was to assess need for change in policy to allow room for personalization of pre-set alarm thresholds according to patient profiles compared to one fixed set for all the patients.

## METHODS

### Study Design

This was a quality improvement study designed in a prospective observational manner. The study was carried out at a step-down telemetry medicine unit of Metropolitan Hospital affiliated with New York Medical College.

### STUDY TOOLS

The study was limited to alarms generated by cardio-respiratory monitor only. All strips printed with each alarm were obtained and evaluated by the attending physician. Data collection occurred over period of 2 months. Alarms were categorized into three groups – true actionable, true non-actionable and false alarms. False alarms were defined as those without any recognizable valid event. Non-actionable alarms were defined as those with valid inciting events but requiring no medical intervention. Actionable alarms defined as those representing change in clinical status of patient requiring urgent intervention by the nursing staff or the physician.

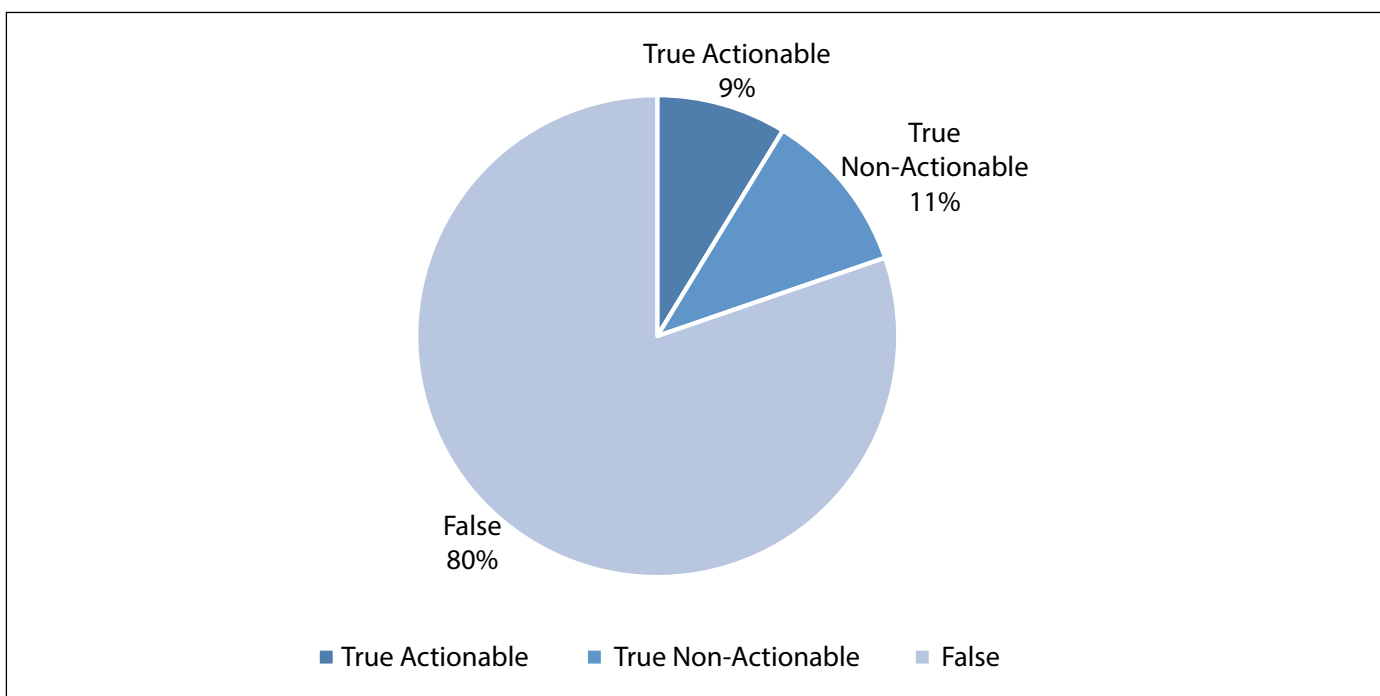
## DATA MANAGEMENT

Telemetry strips collected from medicine floors were de-identified by removing patient information. The strips were collected and stored in a locked room accessible only to authorized personnel. Data was collected without any identifying information. It was stored in form of excel worksheet on computers at Metropolitan Hospital accessible only to authorized users involved in study.

## RESULTS

Total of 1627 alarm strips were collected from cardio-respiratory monitor. Most of the alarms were noted to be false (n=1306, 80.3%). Out of remaining 19.7% alarms; 8.7% (n=142) were diagnostically and therapeutically relevant requiring urgent medical attention but 11% (n=179) were although diagnostically correct but did not require any medical intervention (Figure 1). Those requiring intervention; tachyarrhythmia (e.g. Sinus tachycardia and Atrial fibrillation with rapid ventricular response) was the most common (n=120; 7.4%) followed by Bradyarrhythmia (e.g. sinus bradycardia) (n=22; 1.3%). True but non-actionable alarms were noted to be chronic stable conditions including premature ventricular contractions; rate controlled atrial fibrillation and pacemaker paced rhythm. Irregular heart rate was noted mostly with sinus arrhythmias. False alarms (n=1306; 80.3%) were mostly artifacts noted as apnea, asystole, ventricular tachycardia and fibrillation (Figure 2).

**Figure 1. Prevalence of categorized alarms**



**Figure 2. Types of alarms noted as per machine and their categorization after being reviewed by attending physician**

Alarm type	Total number	Percentage
True Actionable	142	8.7%
Tachyarrhythmia	120	7.4 %
Bradyarrhythmia	22	1.3%
True Non-actionable	179	11%
Premature Ventricular contractions	9	0.5%
Paced beats	117	7.2%
Atrial Fibrillation	22	1.4%
Irregular heart rate	31	1.9%
False	1306	80.3%
Apnea	542	33.3%
Asystole	299	18.4%
Ventricular Tachycardia	293	18%
Ventricular Fibrillation	97	6%
Learning Rhythm	75	4.6%

## DISCUSSION

Alarm system is an essentially very helpful tool for monitoring critically sick patients. But studies have shown overuse of this system in less critical patients in non-ICU environment [3]. Thus American heart association (AHA) had proposed guidelines for appropriate use of cardiac telemetry (Figure 3) [6]. But in some instances; telemetry might have been appropriately indicated but duration becomes over-extended. Most of the cases need only 24-48 hours of monitoring unless indicated otherwise [3]. Adherence to these AHA guidelines was shown to reduce telemetry use by 70% in one of the studies [3].

In our study, we noted that most of the false alarms or artifacts were noted due to patient motion, muscle contractions and in-accurate lead placement. A prospective study showed that proper skin preparation and lead placement can result in 44% decrease in telemetry alarms [14]. The aim of adequate skin preparation is to minimize the resistance to electrodes and thus reducing the artifacts and false alarms. Since the nursing staff are single-handedly involved in this process; they should be regularly educated about the accurate procedure. Some of important steps which are more often missed, include cleaning and drying the skin before application of leads. Clipping the hairs might also be necessary in patients with excessive chest hair [14]. Next is accurate lead placement and 5-electrode use is one of the most common in current clinical practice. This includes 4 limb and 1 precordial leads. In order to avoid muscle artifacts related with limb movement; limb leads are used on trunk. LA and RA are placed on left and right shoulders

respectively, LL and RL on left and right side of abdomen below rib-cage respectively and precordial lead is placed in V1 position. Cardiac monitors show 1 limb lead and 1 precordial lead simultaneously [6].

The next issue is about chronic stable conditions that although give true alarms but does not need medical interventions. For example – monitoring a patient with rate controlled atrial fibrillation gives alarms about irregular heart rate. Another example is about atrial fibrillation mild rapid response for which adequate medication adjustment has been done; but alarm keeps on beeping as there is delay in onset of action of medications. First scenario may not need telemetry monitoring unless otherwise indicated. Second scenario is worth discussion – whether we should change alarm threshold for this patient? Since the problem has been recognized and properly addressed; alarm thresholds can be individualized to avoid excessive fatigue of same alarm. Recommendations made by Joint commission in sentinel event alert included to establish guidelines for tailoring alarm settings and limits for individual patients [16].

Alarm safety has been one of the national patient safety goals which can resonate importance of this issue [13]. ECRI institute still considers alarm hazards as first of top 10 technology hazards in 2015 [15]. ECRI institute has laid down some of recommendations to prevent alarm related events. Establishing a hospital policy describing standard alarm configuration practices related to specific units is of prime priority. And those already having policy; needs to revise policy on regular basis to achieve maximum clinical relevance and patient safety.



**Figure 3. American Heart Association guidelines for cardiac telemetry monitoring**

AHA guidelines for Cardiac telemetry monitoring [6]
<p><b>Class I</b> (Cardiac monitoring is indicated in most, if not all)</p> <ul style="list-style-type: none"> <li>• Post-resuscitation from Cardiac arrest</li> <li>• Early phase of acute coronary syndrome including patients presenting with chest pain with angina equivalent symptoms.</li> <li>• Patients undergone cardiac surgery; Non-urgent PCI with complications;</li> <li>• Patients undergone AICD or pacemaker placement and considered pacemaker dependent</li> <li>• Temporary pacemaker or transcutaneous pacing or intra-aortic balloon counter pulsation</li> <li>• Atrial-ventricular block except chronic stable First degree and Mobitz type I blocks</li> <li>• WPW syndrome with anterograde conduction; Long QT syndrome with Ventricular arrhythmias and other hemodynamically unstable arrhythmias</li> <li>• Acute heart failure or Pulmonary edema</li> <li>• Diagnostic procedures under conscious sedation or anesthesia</li> <li>• Patient started on antiarrhythmic medications which have pro-arrhythmic side effects also.</li> <li>• Overdose from a potentially pro-arrhythmic agent and severe electrolyte abnormalities</li> </ul>
<p><b>Class II</b> (Cardiac monitoring may be of benefit in some patients but is not considered essential)</p> <ul style="list-style-type: none"> <li>• Post-acute myocardial infarction</li> <li>• Chest pain syndrome to rule out Acute coronary syndrome</li> <li>• Patients undergone uncomplicated Non-urgent PCI or routine coronary angiography</li> <li>• Patients undergone AICD or pacemaker placement and are not pacemaker dependent</li> <li>• Patients undergone uncomplicated ablation of arrhythmia</li> <li>• Need for adjustment of drugs for rate control in chronic atrial tachyarrhythmia</li> <li>• Sub-acute heart failure</li> <li>• Evaluation for syncope of unknown etiology</li> </ul>
<p><b>Class III</b> (Cardiac monitoring is not indicated)</p> <ul style="list-style-type: none"> <li>• Permanent rate controlled atrial fibrillation</li> <li>• Surgical and obstetric patients without heart disease</li> <li>• Hemodialysis</li> <li>• Chronic stable ventricular premature beats; ventricular pacing rhythm; Left bundle branch block</li> </ul>

**LIMITATIONS**

First limitation is that we focused only on cardiorespiratory alarms. Second limitation is that we could not follow study to see impact on alarm prevalence after hospital policy revision.

**CONCLUSION**

A comprehensive hospital policy for area-specific alarm configuration must be devised and should include following points:

1. Indications for use of specific alarms
2. Default alarm threshold settings standardized as per specific areas of care
3. Authority to change alarm settings according to individual patient needs and to reactivate default settings for the new patient.
4. Default volume settings and policy regarding adjusting volume as per categorized priority levels.
5. Frequent calibration of sensors and to check efficiency of alarms.
6. Training and education of staff-members about appropriate procedures e.g. proper skin preparation and electrode lead placement.
7. Creating awareness about hospital alarm configuration policy.
8. Regular revision of policy according to feedback.

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## Assessing Healthcare's Potential to Become a High Reliability Organization: A Single Center Study

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### ABSTRACT

**Introduction:** The ultimate goals of health care organizations are to provide exceptionally safe and consistently high-quality care [1]. The complexity of an organizational structure that mainly deals with a constantly changing environment and a human resource-intensive system makes the delivery of the ideal health care very challenging.

High Reliability Organizations (HROs) ensure active involvement and coordination among all staff members from executive management to miscellaneous staff so that specific strategies are always in place to attain their goals and avoid potential errors [1-3]. Chassin recommends three strategic components that a hospital should focus on to become a highly reliable organization – “Leadership” towards zero patient harm, “Safety Culture” where principles and practices are always at play to prevent errors, and “Process Improvement Tools” for constant evaluation and troubleshooting [1]. This study assesses NYC Health + Hospitals/Metropolitan’s (MH) maturity level on Leadership, Safety Culture, and Performance Improvement using Chassin’s Model before and after implementing interventions that target selected parameters.

**Methods:** A pre- and post- intervention survey questionnaire based on Chassin’s HRO model was distributed to the Executive Leadership Committee (ELC). The respondents were then asked to rate MHC’s maturity level with 4 possible responses – Beginning, Developing, Advancing, and Approaching- on domain-specific parameters. After data analysis of the pre-intervention results, the ELC chose the parameter with the lowest maturity level from each domain and designed interventions that will be implemented in a 10 month-period specific to the selected metric. After the implementation period, a post-intervention survey questionnaire containing similar items as the pre-test was given to the ELC.

**Results:** A total of 22 pre-survey and 22 post-survey completed questionnaires were collected. The pre-intervention survey results show that among all the parameters, IT, Accountability and Training gained the lowest maturity level in each main domain. With the help of the interventions implemented, results of the post-survey show a significant improvement in all domain-specific parameters from baseline.

**Conclusion:** We strongly recommend the use of Chassin’s HRO model in assessing the current performance of hospitals as the first step towards becoming a High Reliability Organization. It allows managers to be efficient and effective in identifying salient gaps in the provision of health care services. By designing target-specific interventions that address these gaps, organizations can improve the delivery of services that are consistently high-quality and exceptionally safe for patients and their families.

**Key words:** High Reliability Organization; Patient Safety; Quality Improvement; Errors

### INTRODUCTION

The idea of building a high reliability organization didn’t start in the healthcare systems. By looking at the very high levels of reliability achieved by some organizations like commercial

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aviation [9], nuclear power, and aircraft carriers the idea of HROs in the healthcare gleams brightly [6]. It started that whenever the administrative staffs of healthcare facilities address their problems of not being able to provide the best possible quality for every patient, every single time. “To Err Is Human”, Millions of people suffer every year from adverse-effects related to the healthcare facilities; infections, medications errors [8], problems with transportations between departments or between one facility and

another [7]. The numbers are correct and it shows that an intervention deemed necessary [9]. HROs recognize those kinds of errors early and it even predicts the facility performance over time.

Healthcare organizations are now pursuing high reliability as they have many challenges in common. The complex environment depending on multiple systems that must work synchronously to achieve safety is one of these major challenges; the coordination between personnel especially with co-dependent jobs between different teams is critical yet not always perfect. Another challenge is the multiple decision making and the consequence need for frequent, immediate feedback. HROs must develop a way that makes inter-communication between system and interconnected decision making possible. Feedbacks are then utilized for adjustment and fine-tuning of the procedures in place to help predict and prevent crises.

Chassin’s HRO model reveals any pending organizational failure and allows you enough time to react by considering the near-misses as an opportunity to improve [4]. These abilities lie in the reluctance to accept simple solutions [10]. Although drawing broad lines and trying to simplify solutions is important, digging deep into every small problem is what’s special about HRO. In the time when every problem is referred to as a result of staffing shortage, limited resources, or lack of communication, HRO look for reasons

other than the obvious by further investigating the problem [8]. Resilience of the organization is about being prepared and rather preoccupied with failure by encouraging reporting of near-misses and analyzing them for reasons beyond the surface ones.

Steps to assess an organization’s potential to become a high reliability organization come down to working on three important components; Leadership, Safety Culture, and Performance Improvement. Advancements in these components are assessed by a four-stage system; beginning, developing, advancing, and approaching. Our model is a non-stop procedure that includes the participation and commitment of all three components.

Leadership contains six components the board, CEO, all physicians, the hospital’s quality strategy, its data on measures of quality and Information Technology team support. [2] The most important role is for the board of directors, in order to support the hospital management. Physicians are the main component due to their availability every day and their closeness to the sources of the possible errors [6]. The leadership puts both the quality strategy and measures [11], [5]. At last IT is deployed to sustain automaticity and ensure smooth flow of all operations [7]. A transparent achievable vision that contains incentives and rewards is essential to drive improvement (Table 1).

**Table 1: Adapted from Chassin [2]**  
**Assessing your organization’s potential to become a High Reliability Organization on Leadership [2]**

HRO Characteristic	Component	Stages of Maturity			
		<i>Beginning</i>	<i>Developing</i>	<i>Advancing</i>	<i>Approaching</i>
<u>Leadership</u>	Board	Board’s quality focus is nearly exclusively on regulatory compliance.	Full board’s involvement in quality is limited to hearing reports from its quality committee.	Full board is engaged in the development of quality goals and approval of a quality plan and regularly reviews adverse events and progress on quality goals.	Board commits to the goal of high reliability (i.e., zero patient harm) for all clinical services.
	CEO/Management	CEO/management’s quality focus is nearly exclusively on regulatory compliance.	CEO acknowledges need for plan to improve quality and delegates the development and implementation of a plan to a subordinate.	CEO leads the development and implementation of a proactive quality agenda.	Management aims for zero patient harm for all vital clinical processes; some demonstrate zero or near-zero rates of harm.
	Physicians	Physicians rarely lead quality improvement activities; overall participation by physicians in these activities is low.	Physicians champion some quality improvement activities; physicians participate in these activities in some areas but not widely.	Physicians often lead quality improvement activities; physicians participate in these activities in most areas, but some important gaps remain.	Physicians routinely lead clinical quality improvement activities and accept the leadership of other appropriate clinicians; physicians’ participation in these activities is uniform throughout the organization.
	Quality Strategy	Quality is not identified as a central strategic imperative.	Quality is one of many competing strategic priorities.	Quality is one of the organization’s top three or four strategic priorities.	Quality is the organization’s highest-priority strategic goal.
	Quality Measures	Quality measures are not prominently displayed or reported internally or publicly; the only measures used are those required by outside entities and are not part of reward systems.	Few quality measures are reported internally; few or none are reported publicly and are not part of reward systems.	Routine internal reporting of quality measures begins, with the first measures reported publicly and the first quality metrics introduced into staff reward systems.	Key quality measures are routinely displayed internally and reported publicly; reward systems for staff prominently reflect the accomplishment of quality goals.
	Information Technology	IT provides little or no support for quality improvement.	IT supports some improvement activities, but principles of safe adoption are not often followed.	IT solutions support many quality initiatives; the organization commits to principles and the practice of safe adoption.	Safely adopted IT solutions are integral to sustaining improved quality.

Safety cultures contain five components; maintaining trust, accountability to identify unsafe conditions, strengthening the defense systems against quality failure, and assess safety measures in place. [2] With building a culture where employees can report errors blame-free, the learning, advancing pool of employees expands which ensures reliable reporting of errors and near-misses. Therefore, HROs pursuing organizations gain proactive properties in conducting error analysis, also gain preventive and corrective abilities. As healthcare facilities mature towards high reliability, safety culture measures will become part of both plans and goals to reach a steady plateau of the highest patient and employee’s satisfaction (Table 2).

Sustainable progress requires performance improvement tools to give the HRO capabilities to undergo the substantial rapid changes required for each stage. Each stage has its own purpose, approach and goal for the model to succeed. Further research and re-experimenting are vital to assess the maturity of the HRO. Finally, gaining every support possible can accelerate this transformation (Table 3).

**METHODOLOGY**

A pre-intervention survey questionnaire based on Chassin’s HRO model was distributed to the Executive Leadership Committee (ELC). This model centers on three main domains, namely (1) Leadership, (2) Safety Culture, and (3) Performance Improvement. The respondents were then asked to rate MHC’s maturity level with 4 possible responses – Beginning, Developing, Advancing, and Approaching- on domain-specific parameters.

After data analysis of the pre-intervention results, the ELC chose the parameter with the lowest maturity level from each domain and designed interventions that will be implemented in a 10 month-period specific to the selected metric: Information technology (IT), Accountability, and Training from Leadership, Safety Culture, and Process Improvement, respectively.

To improve **Accountability**, we strengthened our training programs for the majority of our employees in Just Culture. All our employees get Just Culture and Teamstepps training. We have seven certified Master Just Culture trainers in MHC. These trainers helped employees navigate through the just culture

**Table 2: Adapted from Chassin [2]  
Assessing your organization’s potential to become a High Reliability Organization**

HRO Characteristic	Component	Stages of Maturity			
		<i>Beginning</i>	<i>Developing</i>	<i>Advancing</i>	<i>Approaching</i>
<u>Safety Culture</u>	Trust	Trust or intimidating behavior is not assessed.	First codes of behavior are adopted in some clinical departments.	CEO and clinical leaders establish a trusting environment for all staff by modeling appropriate behaviors and championing efforts to eradicate intimidating behaviors.	High levels of (measured) trust exist in all clinical areas; self-policing of codes of behavior is in place.
	Accountability	Emphasis is on blame; discipline is not applied equitably or with transparent standards; no process exists for distinguishing “blameless” from “blameworthy” acts.	The importance of equitable disciplinary procedures is recognized, and some clinical departments adopt these procedures.	Managers at all levels accord high priority to establishing all elements of safety culture; adoption of uniform equitable and transparent disciplinary procedures begins across the organization.	All staff recognize and act on their personal accountability for maintaining a culture of safety; equitable and transparent disciplinary procedures are fully adopted across the organization.
	Identifying Unsafe Conditions	Root cause analysis is limited to adverse events; close calls (“early warnings”) are not recognized or evaluated.	Pilot “close call” reporting programs begin in few areas; some examples of early intervention to prevent harm can be found.	Staff in many areas begin to recognize and report unsafe conditions and practices before they harm patients.	Close calls and unsafe conditions are routinely reported, leading to early problem resolution before patients are harmed; results are routinely communicated.
	Strengthening Systems	Limited or no efforts exist to assess system defenses against quality failures and to remedy weaknesses.	RCAs begin to identify the same weaknesses in system defenses in many clinical areas, but systematic efforts to strengthen them are lacking.	System weaknesses are catalogued and prioritized for improvement.	System defenses are proactively assessed, and weaknesses are proactively repaired.
	Assessment	No measures of safety culture exist.	Some measures of safety culture are undertaken but are not widespread; little if any attempt is made to strengthen safety culture.	Measures of safety culture are adopted and deployed across the organization; efforts to improve safety culture are beginning.	Safety culture measures are part of the strategic metrics reported to the board; systematic improvement initiatives are under way to achieve a fully functioning safety culture.

**Table 3: Adapted from Chassin [2]**  
**Assessing your organization’s potential to become a High Reliability Organization**

HRO Characteristic	Component	Stages of Maturity			
		<i>Beginning</i>	<i>Developing</i>	<i>Advancing</i>	<i>Approaching</i>
<i>Performance Improvement</i>	Methods	Organization has not adopted a formal approach to quality management.	Exploration of modern process improvement tools begin.	Organization commits to adopt the full suite of Robust Process Improvement (RPI) tools.	Adoption of RPI tools is accepted fully throughout the organization.
	Training	Training is limited to compliance personnel or to the quality department.	Training in performance improvement tools outside the quality department is recognized as critical to success.	Training of selected staff in RPI is under way, and a plan is in place to broaden training.	Training in RPI is mandatory for all staff, as appropriate to their jobs.
	Spread	No commitment to widespread adoption of improvement methods exists.	Pilot projects using some new tools are conducted in a few areas.	RPI is used in many areas to improve business processes as well as clinical quality and safety; a positive ROI is achieved.	RPI tools are used throughout the organization for all improvement work; patients are engaged in redesigning care processes, and RPI proficiency is required for career advancement.

algorithm when needed. The Just Culture training and the certified trainers also assisted in promotion of a culture of transparency. These efforts led to the creation of near miss or good catch reporting systems.

1. To improve **Information Technology**, we hired an in-house IT specialist that is readily accessible to assist in all IT concerns, especially in managing Electronic Medical Records (EMR) issues. This allowed on time resolution of both hardware and software problems.

To improve **Training**, a series of extensive training on TeamSTEPPS, Just Culture, Leadership, and Customer Service was conducted to all employees, especially the middle managers. The Lean methodology was also used to improve process flow in different departments.

After the implementation period, a post-intervention survey questionnaire containing similar items as the pre-test was given to the ELC.

**RESULTS**

A total of 22 pre-survey and 22 post-survey completed questionnaires were collected. The pre-intervention survey results show that among all the parameters, IT, Accountability and Training gained the lowest maturity level in each main domain. With the help of the interventions implemented, results of the post-survey show a significant improvement in all domain-specific parameters from baseline (Figure 4).

**DISCUSSION**

The assessment of MHC’s current maturity level on Leadership, Safety Culture, and Performance Improvement allowed the leadership committee and top managers to have a general overview of the hospital’s internal strengths and weaknesses that may be aligned with existing resources to strengthen its

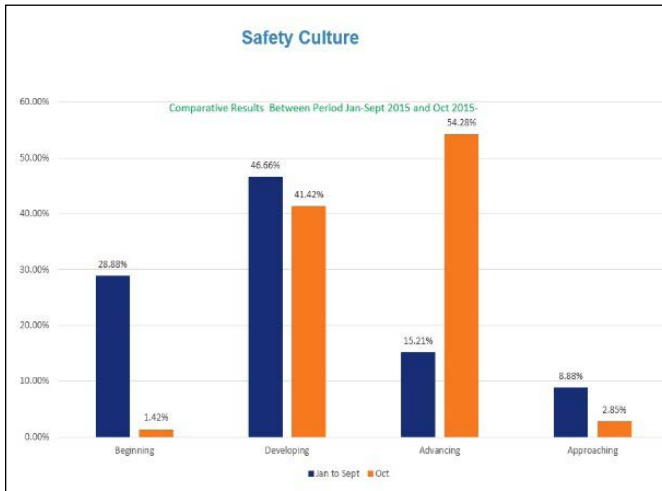
vital processes. The implementation of specific interventions for each of the weakest parameters underwent careful planning and regular evaluation to ensure maximum results. Our in-house IT support facilitated better documentation, and improved the accessibility and timeliness of technical assistance. The training sessions held by our Just Culture specialists strengthened our employees’ knowledge on how to use Just Culture Algorithms, helped in promoting a culture of transparency, and led to the creation of near-miss or good-catch reporting systems. Extensive training sessions on important managerial concepts reinforce compliance and organizational culture.

The study is limited by the small number of pre- and post-surveys collected thereby making the results not generalizable among the entire staff. Despite this limitation, the careful selection of the sample population makes the survey results significant and meaningful.

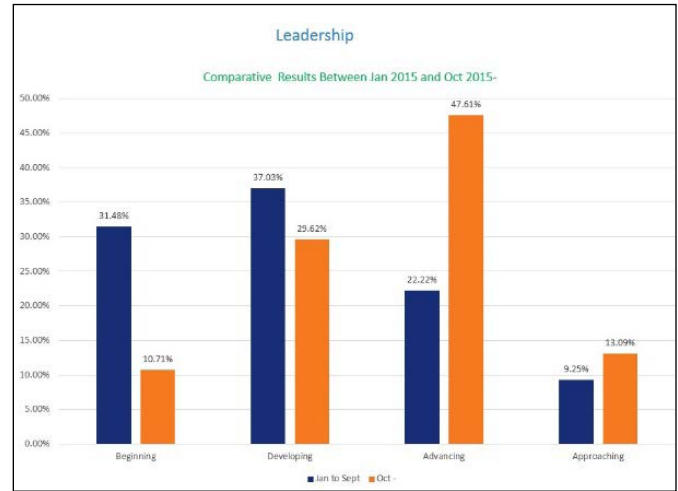
**CONCLUSION**

Becoming a High Reliability Organization allows hospitals to adapt in a constantly changing environment. Attaining this state facilitates processes that continuously attempts to improve organizational effectiveness and efficiency, organizational culture, patient experience, compliance, and documentation. Metropolitan Hospital’s maturity level in Leadership, Safety Culture, and Performance Improvement have improved after careful assessment of the institution’s current performance and implementing target-specific interventions. We recommend regular evaluations and feedbacks from staff members regarding the system processes pertinent to a High Reliability Organization. This continuous process makes way for the implementation of appropriate interventions that is most likely to improve patient safety and the quality of health care services delivered.

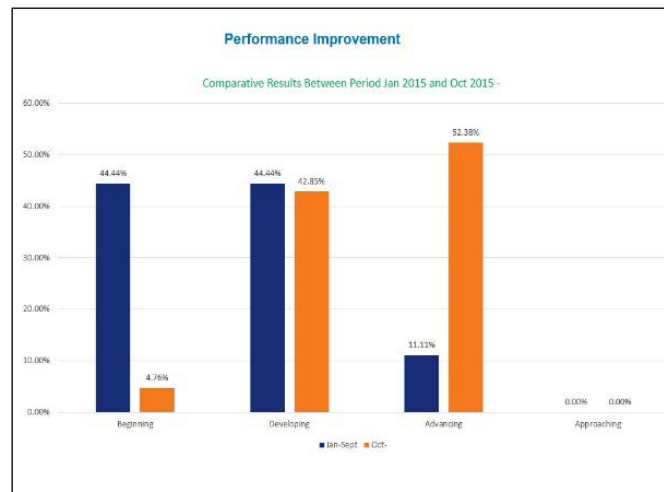
**Figure 1. Comparing Pre- (blue) and Post- (orange) survey results under Safety Culture domain**



**Figure 2. Comparing Pre- (blue) and Post- (orange) survey results under Leadership domain**



**Figure 3. Comparing Pre- (blue) and Post- (orange) survey results under Process Improvement domain**



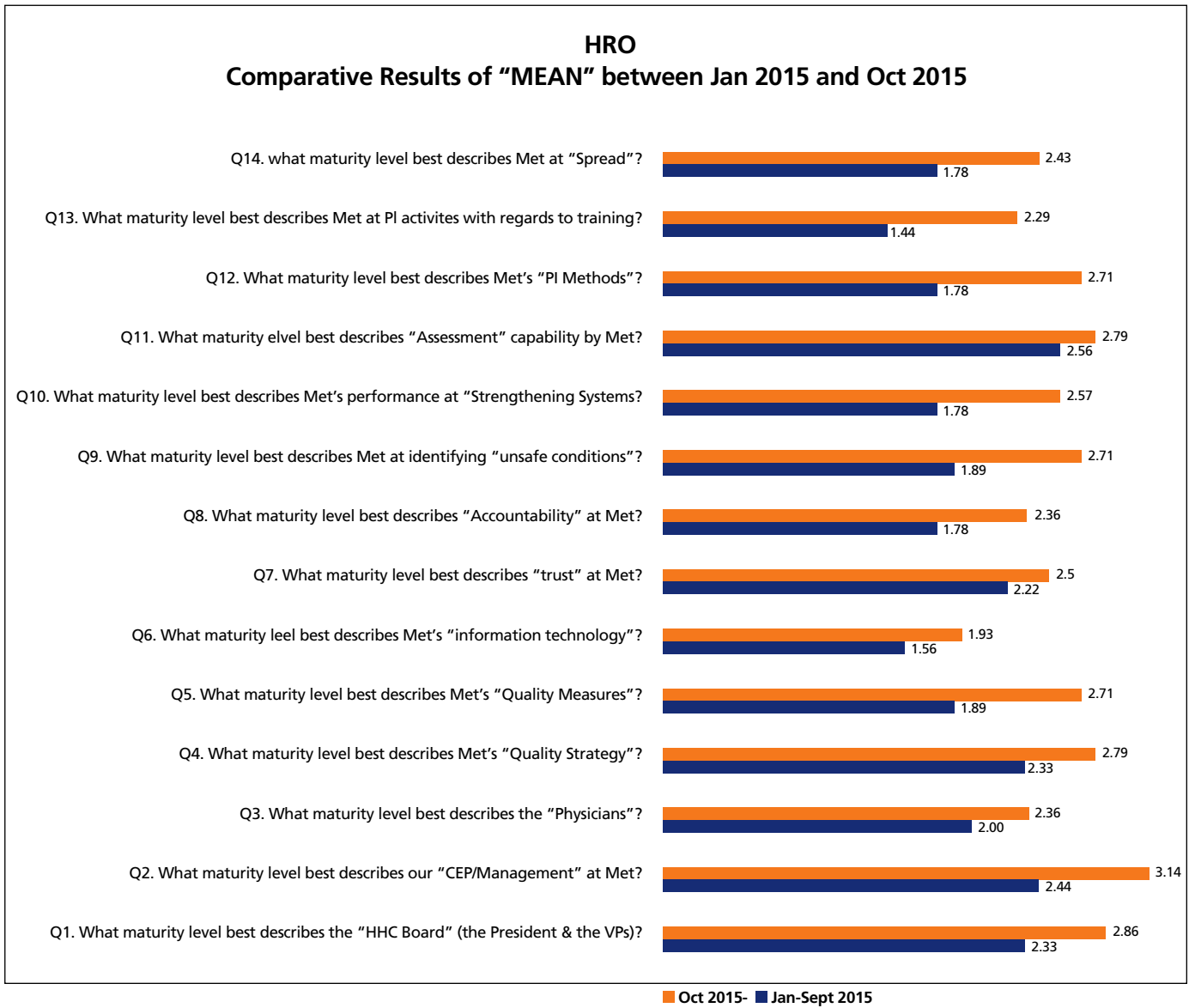
**Information Technology (Leadership)** (Fig 2). In the Pre-intervention survey, 37% of the respondents thought that Information Technology was in the developing stage. After the implementation of the IT intervention, post-survey results show an improvement in the rating with 47% of the surveyors saying IT has moved on to the Advancing Stage.

**Accountability (Safety Culture)** (Fig 1). Forty seven percent of the respondents considered Accountability to be in the Developing stage prior to the intervention. After the training sessions were implemented, more than half rated MHC’s Accountability to be in the Advancing Stage.

**Training (Performance Improvement)** (Fig 3). Pre-intervention results approximates the maturity level of Training in MHC to be either in the Beginning and Developing stages. After rigorous training sessions as the specific intervention for Performance Improvement, survey results show a significant increase in the rating for this domain. Fifty four percent of the respondents rated Accountability to be in the Advancing Stage.

After a 10-month period of implementation, post survey results show a significant improvement in the maturity level of majority of the parameters under all three domains. The means as shown in figure 4 approximates the maturity levels to be somewhere in between the Developing and Advancing stages.

Figure 4. Comparative results of the “Mean” between January 2015 and October 2015





**Conflict of Interest:** All the authors declare that they have no competing interests

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# The Use of Error Self Reporting for Improvement of Surgical Education: A Twist From The Standard Of Surgical Teaching

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## ABSTRACT

**Introduction:** Classic surgical teaching involves the evaluation of a resident physicians by a supervisor that indicates or points out what are the errors that the residents have performed and how they can be corrected. In this study we are evaluating a new surgical educational culture in which residents can learn from self-evaluating their mistakes.

**Methods:** The study was conducted by the surgical residents (PGY1-3) from New York Medical College (NYMC) at Metropolitan Hospital. These residents were given self-assessment forms anonymously for reporting self-errors. Their supervising Attending Physicians were also given the same forms to evaluate the residents on reporting errors. Study was conducted for five months. The data was gathered by the chief-resident and a report comparing self-assessment and reporting was created. Confidentiality of the resident reporting was preserved thus maintain the integrity of the report.

**Results:** A total of 73 reported errors from August 2013 to December 2013 were received. From the PGY-1 level 29 reports (40%), PGY-2 level 37 reports (50%) and PGY-3 level 7 reports (10%). As a group, all training levels felt that the errors were mostly initiated by them (36 out of the 73 reports) with an incidence of 49.3%. The most common errors were communication based (27 out of 73) with incidence of 36.9% and second most common were drug dosing and orders in the chart (23 out of the 73) with incidence of 31.5%. As a group, all residents felt that improving communication between residents, nurses and attending will have a better outcome in patient care (30 out of 73 reports) with an improved care in 41.0% of the cases reported.

**Conclusion:** Allowing resident physicians to recognize their own errors and allowing them to amend those errors improves patient outcomes and safety.

**Key words:** Self Reporting; Surgical Education; Residen Education; Patient Safety

## INTRODUCTION

Classic surgical teaching involves the evaluation of a resident by a supervisor that indicates or points out the errors that the residents have committed and how they can be corrected. Because of this current culture, there can be an overwhelm feeling on behalf of the resident to try to comply with the supervisor standards even if that means altering what he or she feels is the best management. Most of the time, the teaching given is the way that either the attending or the chief resident were taught even though that technique may not be correct or is not comfortable

for the resident to performed. We are trying to determine if self-conscious evaluation using the supervisor as guide, can improve patient care without breaking the attending and chief-resident relation [1].

There are many techniques of teaching and not every resident has the same ability to learn in a given way. The same stands for the way that some of the teachers (either attending or senior residents) try to teach. Many residents have the ability to learn by seeing and doing while others have the ability to learn by reading. The goal is the same, consistent patient care and safety.

This study tries to establish a self-conscious non-judgmental way of resident evaluation

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## METHODS

Surgery residents (PGY1-3) from New York Medical College (NYMC) at Metropolitan Hospital were used for evaluation

and self-assessment study. These residents came from diverse backgrounds, with medical school training from all over the world. These physicians were asked to be part of the study in which an evaluation form was given to them openly and anonymously. The attending evaluator, was also given the same form and residents were also given the same form to self-report. The form includes the institution in which the error occurred, the diagnosis of the patient, the attending physician involved, error or situation that happened, what was done to fix it and what was learned from the situation in order to prevent it from happening again. This data was then processed to create a group guided outcomes in which the supervising physician is not able to identify the error and the outcome for a specific resident, thus keeping the integrity of the report. The reports were tabulated by a designated chief senior resident before showing the outcome to the attending. This gave the chief resident the opportunity to review what type of errors are occurring, how the errors can be prevented, the institution in which the errors occurred, if the patient was informed of the error and if the attending physician was informed of the error.

After obtaining the rough data( percentage only), data was shown to the supervising attending giving them an idea on how the residents as a group were performing and what should be done to improve reporting, without the capability of knowing who was involved. This allows to keep control over the residents, allowing freedom without judgment.

The data obtained then was used to establish guidelines to improve patient care as intellectual growth is promoted.

Data was divided and tabulated using excel 2010 edition and percentages were created according to the error documented, type of error performed and improvement. These numbers obtained then were compared to their peers of the same level program year and also compared to all the levels in conjunction to obtain a group outcome. After the numbers were obtained, they were made available to the attending for comparison and creation of guidelines for improvement of teaching and accentuating based on the most common problem. A total of 73 error were reported from August 2013 to December 2013.

## RESULTS

The report were divided in different levels of training and also compared to the other levels. In this way, we were able to establish the incidences of errors depending level of training year and how that compare to the other group and then used all of them to establish what are the areas that need further improvement in order to create better patient care. A total of 73 reported errors from August 2013 to December 2013 were received. From PGY-1

level 29 reports (40%), PGY-2 level 37 reports (50%) and PGY-3 level 7 reports (10%).

Out of the 29 reported cases by PGY-1 residents (Table 1), 18 reported error were created by the junior resident (62%), the most common error type was an order related/ drug order error which were 10 out of the 29 with a 34% incidence. The communication errors happened most either from sign out or nurse-physician communication with an incidence similar of 10 out of the 29 reported error with a 34% incidence (Table 2) . The most common improvement that can be done at PGY 1 level is improving communication (Table 3).

**Table 1. Error Reported by PGY-1 Level Residents**

PGY-1 Error reported	Total 29/73	40%
Decision making resident	18	62%
Decision making chief	0	0%
Decision making attending	1	3%
Lack of materials	1	3%
Lack of personnel	0	0%
Near miss	4	14%
Mental exhaustion	0	0%
Others	5	17%

**Table 2. Type of Error Reported by PGY-1 Level Residents**

PGY-1 Type of Error	Total	29
Drug dose	10	34%
Clerical error	4	14%
Communication with service	10	34%
Technique	3	10%
Personnel	1	3%
Laboratory error	1	3%

**Table 3. Improvements as per PGY-1 Level Residents**

PGY-1 Improvement	Total	29
Clarification of orders	13	45%
Communication improvement	12	41%
Improve technique of procedures	3	10%
Activate all services required	1	3%

At the PGY-2 level, which had a total of 37 reported error out of all 73 reports that represents a 50% of the total, the most common error seen was a junior resident same level error with 18 out of the 37 reports from this level representing a 48% of the cases (Table 4).

The type of error most commonly seen was a communication during sign out and nurses – physician relation giving 15 out of the 37 reports with an incidence of 40% of the cases (Table 5).

The improvement that the PGY-2 level residents indicates will have better patient care is fine tuning communication during sign out and from nurse physician relation that will show an improvement of 49% of the errors obtained (Table 6).

At the PGY-3 level there was a sudden change of culture , first only 7 reports were obtained from this level training being only a 10% of the cases reported. Also was noted that at this level training, the two most common type of errors were what the resident categorized as a supervisor error which was 42% of the cases and also a technical error most in the Operating room (OR) being a 57% of the reported cases for this group (Table 7).

The type of error mostly seen was technical error in the OR being a 57% of the cases and that is due to the fact that this level does not have a great interaction with the nurses or other physician for either treatment or consults on the surgical wards (Table 8).

What was seen in this group was that the best option for improvement was to increase technical agility giving a better patient care on 4 out of the 7 cases reported with an incidence of 57% improvement (Table 9-12).

As a group, all training levels felt that the errors were mostly initiated by them (36 out of the 73 reports) with an incidence of 49.3% (Table 10, Graph 1).

The most common errors were communication based (27 out of 73) with incidence of 36.9% and a close second drug and orders in the chart (23 out of the 73) with incidence of 31.5% (Table 11, Graph 2).

As a group, all residents felt that improving communication in between residents and nurses and also attending will have a better outcome in patient care (30 out of 73 reports) with an improved care in 41.0% of the cases reported (Graph 3).

In this study was also seen that the patients were informed of the error created only on 38 out of the 73 cases with an incidence of 52% of the cases (Graph 4).

**DISCUSSION**

The culture that has been established from surgical services is that the teacher shows a student how to walk, so they can walk the same way. It has never been established before the idea that a student is allowed to walk on their own, so they can find their

**Table 4. Error Reported by PGY-2 Level Residents**

PGY-2 Error reported	Total 37/73	50%
Decision making resident	18	62%
Decision making chief	4	0%
Decision making attending	4	3%
Lack of materials	2	0%
Lack of personnel	1	3%
Near miss	0	14%
Mental exhaustion	1	0%
Others	7	19%

**Table 5. Type of Error Reported by PGY-2 Level Residents**

PGY-2 Type of Error	Total	37
Drug dose	12	32%
Clerical error	0	0%
Communication with service	15	40%
Technique	8	22%
Personnel	2	5%
Laboratory error	0	0%

**Table 6. Improvements as per PGY-2 Level Residents**

PGY-2 Improvement	Total	37
Clarification of orders	9	24%
Communication improvement	16	43%
Improve technique of procedures	10	27%
Activate all services required	2	5%
Laboratory error	1	3%

**Table 7. Error Reported by PGY-3 Level Residents**

PGY-3 Error reported	Total 7/73	%
Decision making resident	0	0%
Decision making chief	0	0%
Decision making attending	3	42%
Lack of materials	0	0%
Lack of personnel	0	0%
Near miss	0	0%
Mental exhaustion	0	0%
Others	4	57%

**Table 8. Type of Error Reported by PGY-3 Level Residents**

PGY-3 Type of Error	Total	7
Drug dose	1	14%
Clerical error	0	0%
Communication with service	2	28%
Technique	4	57%
Personnel	0	0%
Laboratory error	0	0%

**Table 9. Improvements as per PGY-3 Level Residents**

PGY-3 Improvement	Total	7
Clarification of orders	0	0%
Communication improvement	3	42%
Improve technique of procedures	4	57%
Activate all services required	0	0%

**Table 10. Error Reported by ALL Level Residents**

All levels Error reported	Total 73/73	100.0%
Decision making resident	36	49.3%
Decision making chief	4	5.5%
Decision making attending	8	10.9%
Lack of materials	2	2.7%
Lack of personnel	2	3.0%
Near miss	4	5.5%
Mental exhaustion	1	1.3%
Others	16	21.9%

**Table 11. Type of Error Reported by ALL Level Residents**

All levels Type of Error	Total	73
Drug dose	23	31.5%
Clerical error	4	5.5%
Communication with service	27	36.9%
Technique	15	20.5%
Personnel	3	4.2%
Laboratory error	1	1.3%

**Table 12. Improvements as per ALL Level Residents**

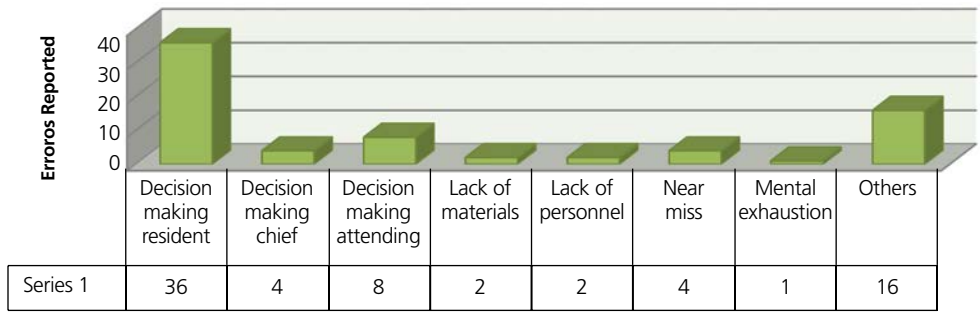
All levels Improvement	Total	73
Clarification of orders	22	30.1%
Communication improvement	31	42.4%
Improve technique of procedures	17	23.3%
Activate all services required	3	73.0%

own pace. By presenting this study we are trying to create a new way of thinking that self-evaluation can improve patient care while maintaining the teacher-student relation with the attending [4, 5]. According to the results, all groups found that increasing communication between the residents, nurses and attending will better improve the patient care in 41% of the cases. Even though there was a change of heart at the PGY-3 training level in which the technicality and decision making now takes a higher role than communication, this numbers were not significantly sufficient to indicate that this will improve patient care when compared to increase in communication ability in between treating entities. It was also noted that 52% of the cases were informed to the patient, establishing a culture that shown poor communication between doctor – patient relation, which by itself shows that needs improvement and even more on the surgical culture in which this situation has always classically been lacking[2,3]. According to our findings, improvement can be obtained by creating better communication skills between physicians, nurses and patients. Thus creating a single non-conflicting group in which the outcome that wants to be obtained is the better care of the patient

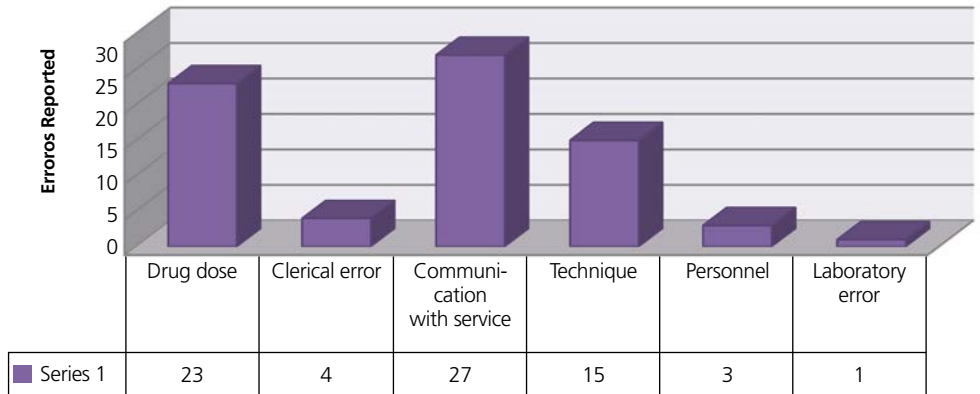
## CONCLUSION

The culture of surgical programs has worked since the beginning of surgical arts, and there is no question that great teachers and even greater students have risen from this classical way of teaching, but times are changing. Times are changing in which there are more way to learn that just seeing, doing and teaching. Giving the residents an early say on how patient care can be improved is an excellent step in order of progress. By allowing the residents to recognize their errors allows them to amend them thus improving patient outcomes. This study has shown that even as early as PGY-1 level recognized that better communication improves better outcome. Also this study has showed that communication with our patients is essential, something that at the moments is not being followed and patients being the most important variable of the equation, they have to be kept up to the par for the full healing process to happened.

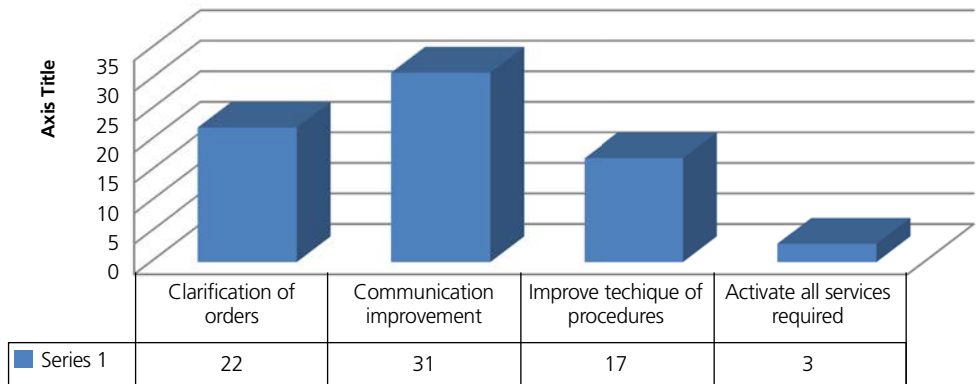
**Graph 1.**  
All Levels Error Reported



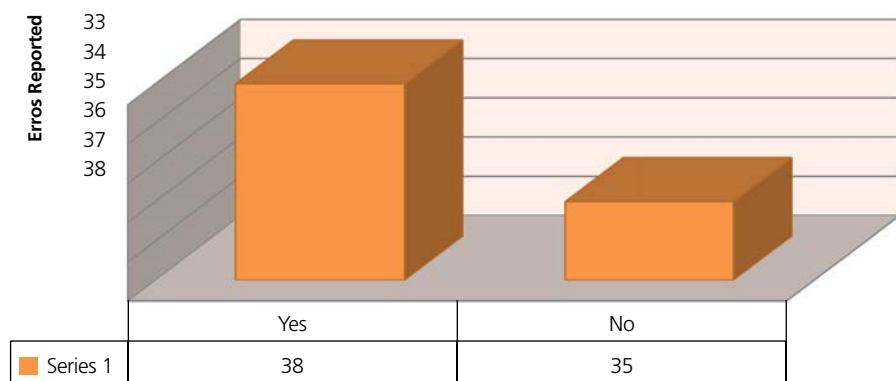
**Graph 2.**  
All Levels Type of Errors



**Graph 3.**  
All Level Improvement



**Graph 4.**  
All Level Patients Informed



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# A Study to Determine Spanish Speaking Parents' Preference of Discharge Instructions in the Pediatric Emergency Department

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## ABSTRACT

**Introduction:** An observational study comparing Spanish-speaking parents' preference of generic discharge instructions versus instructions with diagnosis-specific information in the pediatric emergency department (ED). Our hypothesis is that Spanish-speaking parents prefer diagnosis-specific discharge instructions compared to generic discharge instructions from the pediatric emergency department.

**Methods:** Methods: 500 parents volunteered to participate in the observational study. Parents received either a generic discharge instructions or a disease-specific discharge instructions. The discharge instructions were explained to the parents both verbally as well as in a written format in their language of preference and comprehension was assured before release. Parents then submitted a scored survey in response to the discharge instructions rating their satisfaction following the guidelines explained below. Scoring systems: Parents were asked the following question and then directed to respond using a four point scale: Question: What is your opinion of the printed discharge instructions?

Score 1: Not acceptable.

Score 2: Does not matter, I don't read the discharge instructions.

Score 3: Somewhat acceptable.

Score 4: Highly acceptable.

**Results:** 500 parents participated in the study.

For generic discharge instructions the results were as follows: score 1: 344/500; score 2: 54/500; score 3: 58/500; score 4: 44/500.

For disease-specific discharge instructions, the results were as follows: score 1: 25/500; score 2: 54/500; score 3: 11/500; score 4: 410/500. For acceptance of generic discharge versus disease-specific discharge instructions, Chi-square test was used. A 4 by 2 contingency table was employed for the chi-square test. The p-value was statistically significant ( $p < 0.0001$ ), favoring the disease-specific discharge instructions.

**Conclusion:** Our Spanish speaking parents indicate higher approval for the diagnosis-specific discharge instructions over generic discharge instructions.

**Key words:** Spanish Speaking; Discharge Instructions; Pediatric Emergency Department

## INTRODUCTION

This is an IRB approved study, using an anonymous patient survey. The study is conducted at Pediatric Emergency Department at Metropolitan Hospital, New York. Our hospital is a level II

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Hospital affiliated with New York Medical College. Our emergency department has a separate pediatric emergency department staffed by the attending physicians 24 hours and 7 days/week.

The majority of Pediatric Emergency patients and parents are Spanish speaking (440/500). Majority of the parents who bring their children are women. There were no patient identifiers.

## METHODS

The sample survey was an anonymous parents' survey with no identifiers. Half the population accepted generic discharge



instructions and half accepted disease-specific. 500 surveys were given out.

The generic discharge instructions are comprised of patient name, chart number, date of birth, provider name, final diagnosis, list of medications, dosages of medications, and frequency, the duration of treatment, possible side effects, indications for returning to the ED before follow up, and instructions to call for follow up appointment. The disease-specific discharge instructions, in addition, has detailed description of the diagnosed disease, diagrams if applicable, and standard therapies and precautions with explanations for the disease in question. The main differences between the two types of discharge instructions are summarized in (Table 1).

**TABLE 1. Differences between Types of Discharge Instructions**

	Generic	Disease-Specific
Patient Name	✓	✓
Chart #	✓	✓
Date of Birth	✓	✓
Provider Name	✓	✓
Final Diagnosis	✓	✓
Medication Info (e.g. dosing, frequency, duration)	✓	✓
General Return Instructions	✓	✓
General Follow-up Instructions	✓	✓
Diagnosis Description		✓
Diagrams (if applicable)		✓
Precautions Specific to Disease Diagnosis		✓

Examples of disease-specific discharge instructions include upper respiratory infection, asthma, gastroenteritis, back injury, head injury, female abdominal pain, and male abdominal pain.

The Survey Scores were both in English and Spanish. For both generic and disease-specific discharge instructions the parents were given both verbal as well as written explanations of instructions. The parents were then asked to encircle the score in the survey both for generic discharge instructions and as well as for disease-specific instructions according to their level of satisfaction, either in English or Spanish.

Scoring systems: Parents were asked the following question and then directed to respond using a four point scale: Question: What is your opinion of the printed discharge instructions?

Score 1: Not acceptable.

Score 2: Does not matter, I don't read the discharge instructions.

Score 3: Somewhat acceptable.

Score 4: Highly acceptable.

Regarding the literacy of the parents, most parents have schooling in their native country (Mexico) up to 1st or 2nd standard. They can read and understand the instructions in the Spanish language. Our patients showed understanding of the disease significance and the need to administer medications, in their required frequency, dosages & duration. All the parents were aware of returning to the ER when the child's condition is worsening.

The various diseases conditions encountered in the study period are summarized (Table 2)

**TABLE 2. Various Disease Conditioned Encountered**

Disease	Number of encounters	Disease	Number of encounters
Viral Syndrome	73/500	Lacerations	25/500
Upper Respiratory Tract Infection (Not including Otitis Media)	150/500	Acute Conjunctivitis	26/500
Otitis Media	28/500	Bronchiolitis	9/500
Acute Gastroenteritis	46/500	Croup	6/500
Pneumonia	6/500	Foreign body in ear/nose and throat and foot	8/500
Acute Bronchial Asthma	30/500	Epistaxis	2/500
Sprains and fractures	9/500	Preseptal Cellulitis	2/500
Dental Problems	4/500	Minor Head Injury	7/500
Superficial Abscesses Incision and drainage	4/500 (mostly perianal region)		

**RESULTS**

500 parents participated in the study.

**Table 3. Survey Study for Generic Discharge Instructions**

For generic discharge instructions the results for the scores were as follows:

Score Categories	SCORES
Score 1: Not Acceptable	344/500
Score 2: Does not matter, I don't read the instructions	54/500
Score 3: Somewhat Acceptable	58/500
Score 4: Highly Acceptable	44/500

**Table 4. Survey Study**

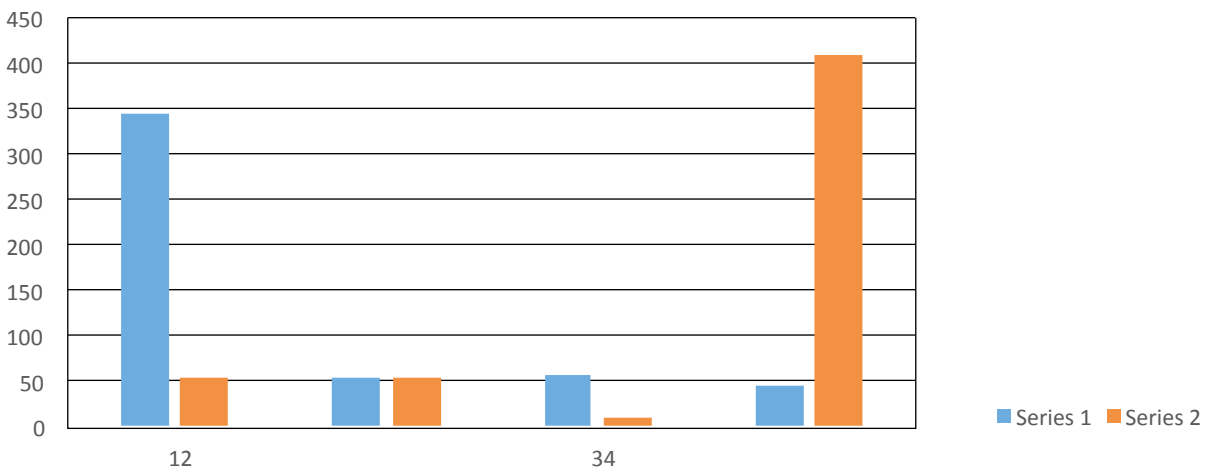
For diagnosis-specific discharge instructions, the scores were as follows:

Score Categories	SCORES
Score 1:Not Acceptable	25/500
Score 2:Does not matter,it's a waste of time, and I don't read the instructions any way	54/500
Score 3: Somewhat Acceptable	11/500
Score 4: Highly Acceptable	410/500

**Table 5. Survey Study**

	Score 1: Not Acceptable	Score 2: Does not matter,it's a waste of time, and I don't read the instructions any way	Score 3 : Somewhat Acceptable	Score 4: Highly Acceptable
generic discharge instructions (500)	344/500	54/500	58/500	44/500
Disease specific disease instructions(500)	25/500	54/500	11/500	410/500

**Graph 1. Survey Study**



## SURVEY QUESTIONNAIRE IN ENGLISH

Acceptance of discharge instructions by parents for generic versus disease specific instructions in the pediatric emergency room.

### Generic Discharge Instructions:

Score 1: not acceptable.

Score 2: It does not matter, I don't read the instructions.

Score 3: somewhat acceptable.

Score 4: highly acceptable.

### Disease Specific Discharge Instructions:

Score 1: not acceptable.

Score 2: It does not matter, I don't read the instructions.

Score 3: somewhat acceptable.

Score 4: highly acceptable.

**Statistics:** Chi-square test was used for survey analysis. A 4 by 2 contingency table was employed for the chi-square test. The p-value was statistically significant, ( $p < 0.0001$ ).

### Parents' survey response (Table 1, Graph 1):

Blue—Generic discharge instructions

orange—Disease specific discharge instructions

- Score 1: not acceptable.
- Score 2: does not matter, I don't read the instructions.
- Score 3: somewhat acceptable.
- Score 4: highly acceptable.

## CONCLUSIONS

Our study confirms that Spanish-speaking parents preferred the specific diagnosed disease discharge instructions compared to generic discharge instructions, in the pediatric emergency department (ED).

## DISCUSSION

Our Hospital generic discharge instructions essentially contain name of the patient and chart number, patient diagnosis and emphasizing the details and the importance of returning to the ED when the patient's condition is worsening; details of medications such as dosages, frequency, duration and finally a telephone number to call for follow up appointment with Primary care Physician (PCP).

Disease-specific discharge instructions, in addition to patient's name, chart number and patient's diagnosis, also give more detail description of discharge diagnosis like otitis media with diagram of otitis media, causes and management, treatment-dosages, frequency of administration, and total duration of treatment.

Finally a telephone number is also given to call for follow up appointment, with the same details as is the case with generic discharge instructions, and indications to return to ED when the patient's condition is worsening.

The physician explains all the aforementioned details to the parent with the parent's acknowledgement that they have received, understood and agreed to follow up with discharge instructions. The physician later hands over the chart to the nurse for nurse education, before they are discharged with parent signed copies of discharge instructions; one copy to the parent, one copy in the patient's medical record, and an electronic copy is sent to the Pediatrician by the secretary.

Giving patients appropriate discharge instructions prevents recurrent ED visits and re-hospitalizations thus improving both the quality of life for patients and the financial well-being of health care systems.

A provider must take into account a number of factors beyond the medical determinants. These factors include: patient cognitive status; patient activity level and functional status; the nature of the patient's current home and suitability for the patient's conditions, availability of family or companion support, ability to obtain medications and services, availability of transportation from hospital to home and for follow up visits and finally of availability of services in the community to assist the patient with ongoing care [1].

Elements of the discharge process include discharge planning, medication reconciliation, discharge summary and patient instructions. The important elements in the discharge summary include, the outcome of the hospitalization, the disposition of the patient, provisions for follow up care including appointments, statements of how care needs will be met and plans for additional services (e.g. hospice, home health assistance, skilled nursing).

According to the study conducted by Waisman Y., Siegal et al, overall understanding of emergency department instructions by the parents is good but understanding of the treatment instructions can be further improved with the use of diagnosis-specific information [2].

Another study according to Vashi, A. and Rhode, K.V. regarding verbal discharge instructions found that verbal discharge instructions are often incomplete and most often patients are not given enough opportunities to ask questions or confirm understanding [3].

In another study according to Issacman, D. and others studied the effect of standardized instructions for better communication of discharge information. They found both at exit interview and at follow-up, parents receiving either form of standardized instructions showed significantly greater knowledge of information related to their child's illness than did controls. They

also emphasize that the addition of written instructions to standardized verbal instructions did not improve parental recall of discharge information [4].

Spandorfer and his colleagues studied parents' comprehension of their discharge instructions in inner-city hospital regarding the adequacy of comprehension of written discharge instructions. According to them the overall comprehension rates in the inner-city population were good despite the fact that ED instruction sheets were written at an inappropriately high reading level. Verbal instructions given by the discharging physician likely have a significant effect on patients' comprehension of instructions [5]

Dr. Waisman and his colleagues conducted a study to determine whether parents really understand the emergency department discharge instructions. The study concludes that overall, parental understanding of ED discharge instructions is good. However, there remains a considerable number (about 20%) who fail to fully comprehend the diagnosis or treatment instructions and according to them some patients might benefit with the use of lay terminology by the staff, institution of special discharge nurse, or use of diagnosis-specific information sheets [6].

A study conducted by Johnson and colleagues, regarding the written and verbal information versus verbal information only for patients being discharged from acute hospital settings to home found that providing both verbal and written health information is more effective in improving knowledge and satisfaction than providing verbal information only for parents of children being discharged from hospital to home [7]. But however a study conducted by Issacman, D.J. and colleagues found that the addition of written instructions to standardized verbal instructions did not improve the parental recall of discharge information [4].

In another study, Williams, D.M. and colleagues aimed to determine reading level necessary to understand the commonly used ED discharge instructions and the functioning reading level of adult patients treated in an urban hospital ED. According to

their study ED discharge instructions are frequently written at a level beyond the comprehension of a significant portion of the population [8]. However, even with our Spanish speaking parents, the educational level is not a barrier for understanding and comprehending discharge instructions. Our study proves that our patient population has a higher approval for the diagnosis-specific discharge instructions over generic discharge instructions.

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# Polypharmacy and Fall Risk in an Acute Inpatient Rehabilitation Unit

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## ABSTRACT

**Introduction:** Falls are a common occurrence in the inpatient hospitalized patient population and are associated with potentially detrimental consequences. Although multiple factors may contribute to the increased risk of falls in hospitalized patients, medication side effects and potential interactions have known to be of particular concern and reported in the literature. Logically this may be even more concerning for those patients requiring engagement in out of bed activities on a more frequent basis, as would be expected in an acute inpatient rehabilitation setting.

**Methods:** The authors of this study aim to look at a potential correlation between fall events and total fall-risk-increasing drugs (FRIDs) patient's take while undergoing acute inpatient rehabilitation. The sample size included 778 total patients, divided into 2 groups: those who sustained a fall and those who did not fall. Patients with multiple impairments and functional limitations were considered and the total FRIDs and FRID classes were recorded and analyzed.

**Results:** Analysis of fallers vs non-fallers regarding total medications and total classes of medications taken, revealed p values of 0.5950 and 0.8906 respectively. This was not shown to be statistically significant.

**Limitations:** Some limitations of the study include a relatively large discrepancy between the faller and non-faller groups, there was no monitoring of potential drug interaction among the FRID classes each patient was taking, and FRID class dosing for each patient was not taken into account when assessing contribution to fall risk amongst the 2 groups.

**Conclusion:** In contrast to previous studies, no significant difference was seen during acute inpatient rehabilitation, regarding total FRIDs and FRID classes in both fallers and non-fallers.

**Key words:** Polypharmacy; FRIDs; Rehabilitation; Fall

## INTRODUCTION

Falls are a common problem in the inpatient hospitalized patient population and are attributed to multiple factors. The resulting detrimental consequences of falls include increased morbidity, mortality, and economic healthcare costs. According to the 2013 Center for Disease Control (CDC) statistic, the cost of falls in the elderly alone accounted for \$34 billion. For those patients undergoing daily rehabilitation, additional consequences may include fear towards functional activities, injuries with delay in recovery, and further functional decline and deconditioning.

Many unique variables have been demonstrated to work either independently or in concert to predispose a patient to fall. These include age, underlying co-morbidities, level of gait

instability, depth of confusion, presence of urinary incontinence, low Functional Independence Measure (FIM) score, and use of Fall-Risk Increasing Drugs (FRID). Of these multiple factors, medication side effects and potential interactions have known to be of particular concern contributing to falls. In particular, a group of these medications are known to be associated with an increased incidence of falls and are known as FRID. Logically this may be even more concerning for those patients engaging in out of bed activities on a frequent basis, as would be expected in an acute rehabilitation setting.

Prior studies document specific classes of FRIDs contributing to increased incidence of falls and potential injury. In a meta-analysis review by Leipzig et al., several studies found that taking either benzodiazepines, antidepressants, neuroleptics, or any psychotropic drug contributes to falling independent of other risk factors [1]. Additionally, psychotropics in particular have shown to be associated to impair performance on balance, reaction time, and other sensorimotor findings [1]. A similar

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effect on balance and standing steadiness has been associated with the use of hypnotic drugs such as Triazolam, Flunitrazepam, Zolpidem, and Zaleplon, with impairment in these parameters persisting into the morning after a prior bedtime dose [6]. Leipzig et al. also performed a meta-analysis on the effects of cardiac medications and fall risk, and found Digoxin, type IA antiarrhythmics, and diuretic use weakly associated with falls in older adults [1]. This may pathophysiologically be explained by the development of orthostasis and/or impaired cardiac response to sudden alterations in body position on attempted standing and ambulation activities. Finally, pain medication regimens have also been observed to be associated with increased fall risk. The use of narcotic analgesics in particular have been reported to have an odds ratio of 3.3 for falls and fractures compared to those who received COX-2 inhibitors, and 4.1 when compared to patients receiving an NSAID [7].

The purpose of this retrospective study is to assess the correlation between falls and the use of drugs with the potential to increase fall-risk (FRID) in patients admitted to acute inpatient rehabilitation with various medical conditions and underlying co-morbidities. The medications under investigation include psychotropics, antihypertensives, antiarrhythmics, benzodiazepines, antidepressants, antiepileptics, opioids, and spasmolytics as described in a meta-analysis study by Leipzig et al. in 1999 [1]. Our goal will be to examine the use of these particular classes of medications when consolidating patient's medication list and correlating them with fall occurrence [2]. Previous studies have documented a 70% increase in fall risk with exposure to each additional FRID [3]. The information obtained from this study may guide clinicians when assessing patient risks for fall during inpatient rehabilitation, especially when these medications are identified.

## METHODS

This study was approved by the New York Medical College Institutional Review Board and the New York City Health and Hospitals Corporation Research Review Board to be conducted at Metropolitan Hospital. The medical record of patients admitted to Metropolitan Hospital's acute inpatient rehabilitation unit within the period of January 1, 2011 - November 1, 2013 were reviewed retrospectively via the Quadramed electronic medical record system.

The medication records of patients who sustained a fall and a cohort of those who did not sustain a fall during their stay in the inpatient rehabilitation facility were reviewed. The World Health Organization (WHO) designates a fall as an event which results in inadvertent rest upon the ground or floor or other lower level [4]. The finding of a documented fall in an incident report completed

by a staff member, witnessed or unwitnessed, was the criteria to include the case in this study. Only in these circumstances was a patient recorded to have sustained a fall. The number of total medications, different drug classes, and individual medications each patient was taking, were recorded.

Statistical analysis of the data was performed using a two way FREQ procedure and pooled T Test with significance determined by p values set at <0.05.

## RESULTS

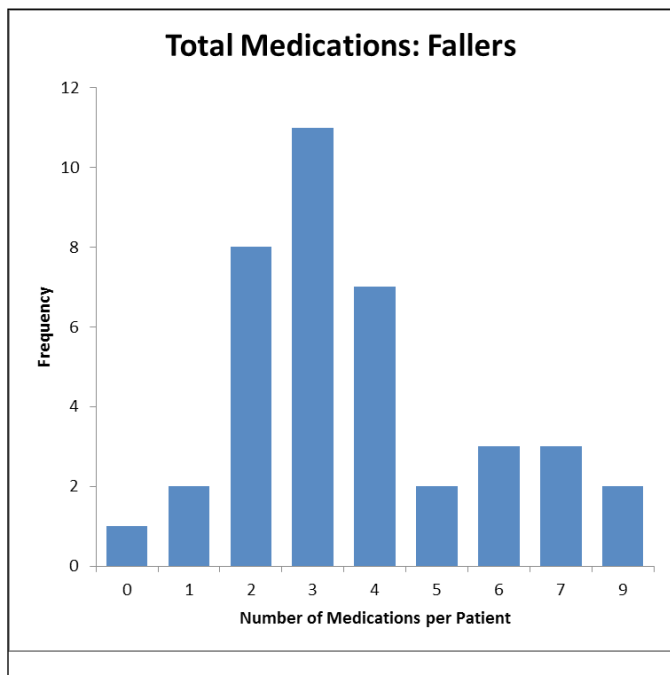
After pooling the total patient population admitted to Metropolitan Hospital acute inpatient rehabilitation unit from the January 1, 2011 - November 1, 2013 period, 778 total patients were identified. This sample size was divided into 2 groups: those who sustained a fall and those who did not fall. 39 patients were identified as fallers and 739 non-fallers. The total medications and total classes of medications (FRID classes) from each patient group designation was calculated and recorded with percent and mean values obtained. Classes of medications included, calcium channel blockers, beta-blockers, diuretics, angiotensin converting enzyme (ACE) inhibitors, antipsychotics, sedative hypnotics, benzodiazepines, antidepressants, anti-arrhythmics, digoxin, central anti-hypertensives, nitrates, opioids, and non-opiate pain medications.

For the fall group, the total medications each patient was taking ranged from 0 – 9 medications and total classes of medications (FRID classes) from 0 – 7. The majority of fallers were taking between 2 – 4 total medications with 28% (11 patients) on 3 medications, 20% (8 patients) on 2 medications, and 18% (7 patients) on 4 medications (Figure 1). The total classes of medications for each patient in the fall group in its majority were taking between 2 – 4 total classes of medications with 33% (13 patients) on 2 classes, 30% (12 patients) on 3 classes, and 15% (6 patients) on 4 classes (Figure 2).

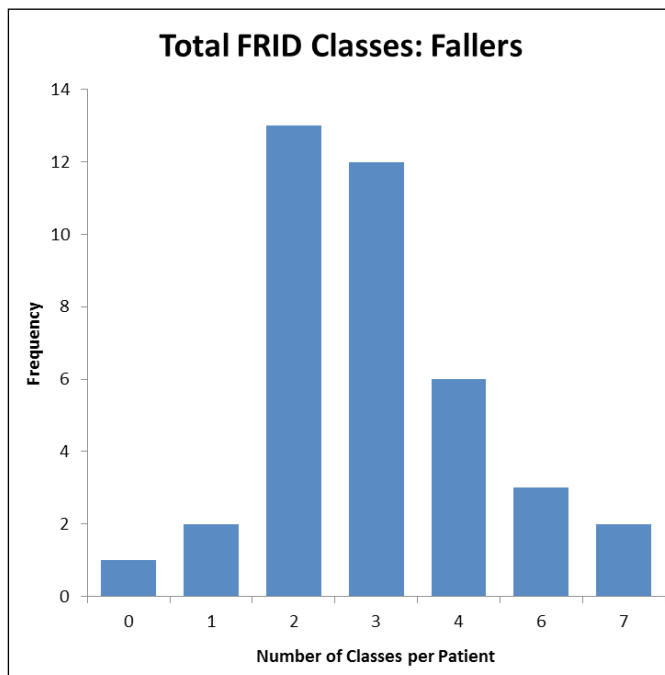
For the non-fallers, the total medications for each patient ranged from 0 – 12 medications and total classes of medications (FRID classes) from 0 – 8. The majority of non-fallers were taking between 2 – 5 total medications with 19% (137 patients) on 2 medications, 18% (134 patients) on 4 medications, 17.8% (132 patients) on 3 medications, and 13% (98 patients) on 5 medications (Figure 3). For the total classes of medications in the non-faller group, the majority were taking between 2 – 4 total classes of medications with 21% (157 patients) on 2 classes, 20.7% (153 patients) on 3 classes, and 19% (140 patients) on 4 classes (Figure 4).

For all patients both fallers and non-fallers, the mean total medications was approximately 4 medications with a standard deviation of 2 medications. The mean total classes

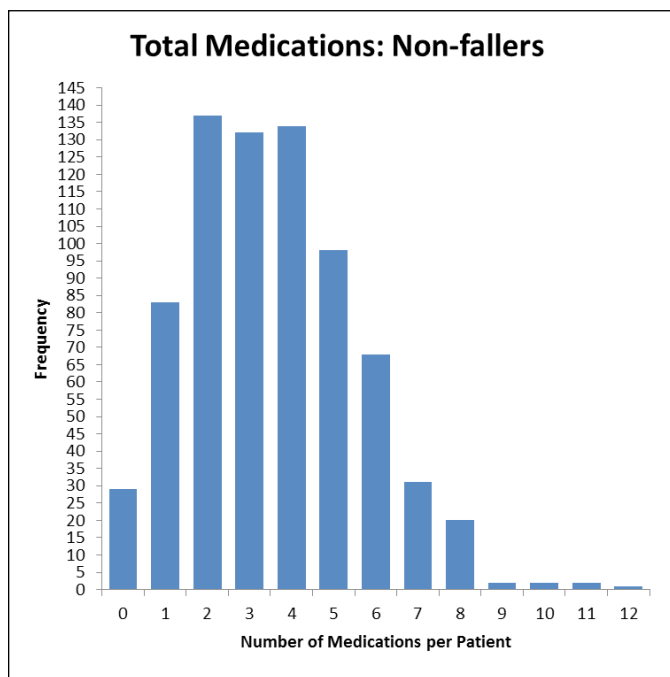
**Figure 1. Total Medications and Frequency of Fallers**



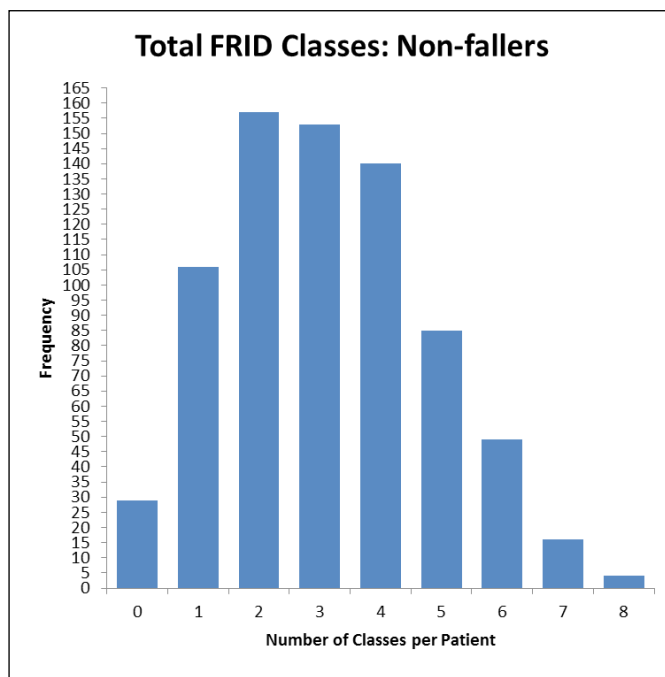
**Figure 2. Total FRID Classes and Frequency of Fallers**



**Figure 3. Total Medications and Frequency of Non-fallers**



**Figure 4. Total FRID Classes and Frequency of Non-fallers**



of medications were approximately 3 classes with a standard deviation of 1-2 classes. Analysis via the pooled T-test statistic of fallers vs non-fallers regarding total medications and total classes of medications taken, revealed p values of 0.5950 and 0.8906 respectively. This was not shown to be statistically significant. The authors felt it would be unnecessary to assess for the significance of each specific drug class as a risk factor for falls in this population. Previous literature establishing thresholds for number of FRIDs classes that predicted falls was greater than two medications.

## DISCUSSION

Previous studies correlating FRIDs classes with falls in hospitalized patients have demonstrated a positive fall risk correlation, and increased fall occurrence with increasing number of FRIDs each patient received. In a study by Bennett et al., the threshold for number of FRIDs that predicted falls was 2.5 in the older population, and concluded that both FRIDs and total medication use were associated with adverse outcomes [3]. This has also been extrapolated to the younger and middle aged population. In a study by Kool et al., there was an increase in fall injury risk with the use of 2 or more prescription medications compared with one or no medications after controlling for age, gender, and ethnicity [5]. It is the author's belief that our study is the first to assess for FRIDs use and fall risk in an acute inpatient rehabilitation unit setting.

The findings of our study did not correlate with those in previous studies, particularly the increase of number of FRIDs and risk of fall. Although it is logical that increasing the medication induced fall risk burden would contribute to an increasing number of falls, the majority of patients who sustained falls received 2 – 4 total medications, which also reflected the majority of patients who did not fall. There was no demonstrable increased fall incidence with those taking greater than four medications in this study.

The findings in this study do not significantly demonstrate an increased fall risk with FRID class burden as would be expected from prior studies. In regards to the total number of FRID classes each patient consumed in both fallers and non-fallers, there was no significant difference between the two groups. The increased drug-drug interactions which are known to further increase the risk of falls would be expected to occur in those taking more classes of FRIDs. However, this also was not reflected in this study, with both fallers and non-fallers receiving approximately the same number of classes of medications.

Two possible explanations for these results can be considered. First, the dose of medication and frequency administered may be well below that commonly prescribed in an acute medical

floor given other treatment options available (e.g. modalities for pain) on an acute inpatient rehabilitation unit, thereby avoiding the common side effects from the use of multiple medications which may lead to an increase in fall risk. Secondly, the actual fall incidence on the acute inpatient rehabilitation unit may have been obscured by the additional preventive measures, staff training and therapy interventions provided to patients during their rehabilitation stay, despite the increased fall risk incurred by medication use.

Common measures employed to prevent falls in the acute inpatient rehabilitation setting are to initially risk stratify patients based on functional ability and probability of sustaining a fall. This is usually determined by initial patient Functional Independence Measure (FIM) scores, cognitive abilities, safety judgment, insight, and impulsivity. Patients at increased fall risk based on these factors, would tend to have the implementation of a one to one observer in place prior to a potential fall incident from occurring. Additionally, any out of bed activities in these patients with increased fall risk, would require bed alarms, close supervision or assistance level interventions during such activities, by either nursing staff or physical/occupational therapists. Finally, the therapeutic treatment in regards to balance, proprioception, transfers, core strengthening, safety awareness and ambulation training that patients receive while undergoing acute rehabilitation, may in fact compensate for, or even counteract, the detrimental limitations incurred with immobilization and by FRID medication use.

Pre-assessment of each individual patient's FRID burden during inpatient hospitalization may be important to prevent potential fall related injury, despite the lack of evidence provided in this study. The Haddon matrix, a commonly used paradigm in the field of injury prevention, systematically assesses injury and identification of preventive methods. When applied to falls, it has been found that key areas to focus on include, changing medication use, modifying prescribing practices, and performing medication reconciliation at care transitions [4]. A prospective cohort study found that complete withdrawal of, or at least a dose reduction of FRIDs, is as effective as a single intervention for falls prevention. This has also shown to be cost effective, while improving measures of physical mobility [4, 8-10]. Therefore, reducing FRID number and/or dose burden during the acute hospital course or prior to initiating acute rehabilitation, is an important intervention to prevent patient falls on their road to recovery.

Some limitations of the study which may have accounted for the observed results are as follows. First, a relatively large discrepancy was present between the faller and non-faller groups. Although it is fortunate the number of fallers was kept to a minimum, likely



the result of the numerous preventive measures in place on the acute rehabilitation unit, this may have confounded the ratio of fallers to non-fallers thereby underestimating true fall occurrence attributed to medication side effects. Second, there was no monitoring of potential drug interaction among the FRID classes each patient was taking, including both combinations with other FRIDs and with other medications which may potentially alter medication metabolism, for example Bactrim or Flagyl which are known cytochrome p450 inhibitors. Third, FRID class dosing for each patient was not taken into account when assessing contribution to fall risk amongst the 2 groups. Although logically a higher dose of the fall contributing medication would potentially increase the side effects experienced by the patient via the dose effect principle, this was not analyzed in our study.

## CONCLUSION

Multiple factors may contribute to the increased risk for falls in hospitalized patients, with medication side effects and potential interactions between medications known to be of particular concern. No significant difference was found in this study in regards to the potential increased risk for falls with the use of FRIDs class of medications during acute inpatient rehabilitation. A potential use of the FRIDs class of medications may be an assessment tool when performing medication reconciliation and for stratifying fall risk during admissions. Review and adjustment in medication regimens should always be a part of the physician's fall preventive measures and overall patient care plan.

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# Huddle Effect: Improving Patient Satisfaction Through Targeting Staff Communication

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## ABSTRACT

**Introduction:** Emergency department (ED) serves as the gateway to all other care providers in a hospital for majority of the patients. The purpose of the study is to investigate how staff communication influences patient flow and patient satisfaction in a busy ED. In the commencement, the aim were set to assess staff satisfaction and staff opinions on communication openness before and after the intervention. Observing the cultural changes inside the system over a time period of two years was also an outstanding point of this study.

**Methods:** Lean methodology and rapid improvement event was conducted to identify gaps among staff communication in the ED. Root causes were identified for each gap. Two hour team huddle system was created using a checklist and the results were analyzed. Any issue that needed a follow up was to be mentioned on a white board unless and until it was solved.

**Results:** This study analyzes the lasting impact of a new policy creating a frequent huddle system in the ED. Occurrence reports over a sixty day period dropped from approximately 12 per month to 3 per month. The number of daily huddles increased from zero to six per day. Staff satisfaction improved in all fields experimented. Also the quality of communication was enhanced throughout the system, especially among the transporters and triage nurses. The left without being seen decreased from 236 per month to 135 per month. And the dwell time for admitted patients decreased from 115 minutes to 96 minutes. The Press Ganey patient satisfaction scores for overall ED satisfaction rose from the lowest single value to 88.1%, representing highest value in the corporation.

**Conclusion:** Designed to improve poor staff communication and satisfaction, its positive impact on patient satisfaction greater than two years after implementation was identified as the main contributor to a large increase in patient satisfaction and improvement in many patient-centric metrics.

**Key words:** Huddles; Patient Safety; Patient Satisfaction; Emergency Department Flow; Communication; Staff Satisfaction.

## INTRODUCTION

According to Joint Commission data, 6.1% of sentinel events take place in the emergency department [6]. In the modern hospital environment the Emergency Department (ED) serves as the gateway to all of the other care services provided at the hospital for the overwhelming majority of patients the hospital will see. With the diversity of care options seemingly available to the average urban citizen, there exists an aspect of choice within a patient's health decisions. This element of choice can sometimes run contradictory to a patient's best medical interests as access

to care and continuity of care can suffer as patients repeatedly enter unrelated systems as "new patients." Metropolitan Hospital emergency department is a Level II trauma center that serves approximately 70,000 patients a year. In a fast paced ED, communication among staff members is crucial to providing effective and efficient care to critically ill patients. An internal review of the department showed ED staff often felt underappreciated and disconnected from both the clinical and administrative leadership. The ED at the start of the experimental process had one of the lowest patient satisfaction scores and the highest rate of patient walk out in the New York City and Hospitals System.

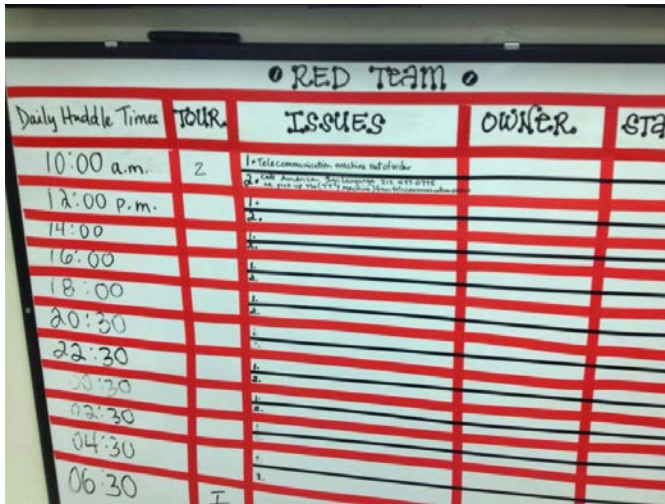
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## OBJECTIVE

This experiment set out to create a modified culture in the ED which would foster better communication. Initial goal was

**Figure 1. Whiteboard Example**



to improve staff satisfaction and by improving communication. The additional objective of tracking cultural changes within the system over two years time was unique to this current analysis.

**METHODS**

In the ED, issues of the base state were identified by polling the staff. Leading problems in the poll included poor communication, unclear roles and responsibilities, lack of leadership visibility, staff feeling isolated by the team and safety concerns. Issues were analyzed by a LEAN improvement team. The leading complaints were broken down into “gaps” and the root cause was found for each gap. A flow cell concept for addressing issues was used to ensure we could tighten connections between building blocks of a functioning system. A Rapid Improvement Event was performed to evaluate solutions to the problem areas identified. It was found that gaps could be identified as existing in three key areas of communication, policy, and staff. Communication between physicians and nurses is frequently ineffective in the ED as there is no standard process to maintain clear lines of communication. Inconsistent adherence to policy could be improved by addressing the lack of accountability and lack of visual prompts in the busy ED setting. Interactions with staff could be improved by involving administrative staff in day to day ED problems as well as providing visibility and accountability in addressing issues identified by staff. The huddle structure was selected as a solution which addresses the identified issues. It was selected for being a proactive system of looking at issues in real time and uses integrated teams to solve issues. Initial protocol called for 12 huddles per day in the ED, held by each ED team, which would address any and all pressing issues and would include members of all levels of ED staff. A protocol sheet was created to help drive the huddle towards addressing common issues of workflow, patient

**Figure 2. The Experimental Product, the Checklist**

DAILY HUDDLE SHEET	
RED TEAM	GREEN TEAM
HUDDLE TIME: _____AM/PM	HUDDLE TIME: _____AM/PM
DATE: _____	DATE: _____
Huddle Missed/Delayed (Reason): _____	Huddle Missed/Delayed (Reason): _____
Who are your Team Members [Name]?	Who are your Team Members [Name]?
Have all staff used 2 patient identifiers. team patients?	Have all staff used 2 patient identifiers. team patients?
Are there any Admissions/Discharges/Transfer delays?	Are there any Admissions/Discharges/Transfer delays?
Any Pending Medication Issues?	Any Pending Medication Issues?
Any Patients in the ED >3 hours?	Any Patients in the ED >3 hours?
Are there any broken Equipment or Supply issues?	Are there any broken Equipment or Supply issues?
Are there any Escort delays?	Are there any Escort delays?
Any Environmental issues?	Any Environmental issues?
Are there any Safety Issues (HP)?	Are there any Safety Issues (HP)?
Any pending Radiology and/or CT Scans/Labs?	Any pending Radiology and/or CT Scans/Labs?
Social Work or Care Manager Consults?	Social Work or Care Manager Consults?

DAILY HUDDLE SHEET	
Are there any patients for observation?	Are there any patients for observation?
Any Pending Medical consults?	Any Pending Medical consults?
Please refer to your folder for incomplete charts	Please refer to your folder for incomplete charts
Staff Recognition	Staff Recognition
Other Issues:	Other Issues:
Issue Owners	Issue Owners
RN _____	RN _____
MD _____	MD _____
Administrator _____	Administrator _____

safety, and department functionality (Figure 2). Issues that were identified were recorded on the checklist and any issues needing follow up were put on that teams white board. The white board served as a visual cue for tasks to be done, and personnel were assigned with a date and time of assignment (Figure 1). Once the issues was resolved, it was taken off the white board.

**RESULTS**

Occurrence reports over a sixty day period dropped from approximately 12 per month to 3 per month. The number of daily huddles increased from zero to six per day. Staff satisfaction improved in all fields queried (Figure 3). Of note, self-report of ED morale increased from less than 50% to 80% over the sixty day period (Figure 6). Additionally, quality of communications as reported by staff increased across the board, with the greatest increases amongst transporters and triage nurses (Figure 4, 5).

Additional halo effects were also identified after the introduction

**Figure 3. 30 and 60 day outcomes**

Metric	Base	Target	30 Day	60 Days
Occurrence Reports	130	60	3	6
Team Huddles	1	12/day	5/day	6/day
Staff Satisfaction	47%	75%	N/A	61%

of huddles. In the eleven month period prior to huddles, the left without being seen rate was 236 per month. After huddles began, the number had dropped to 135 per month over a 4 month period (Figure 6). Additionally, the dwell time for admitted patients decreased from 115 minutes to 96 minutes. Triage to exit time for admitted patients decreased from 6 hours to 5 hours and fifteen minutes (Figure 7).

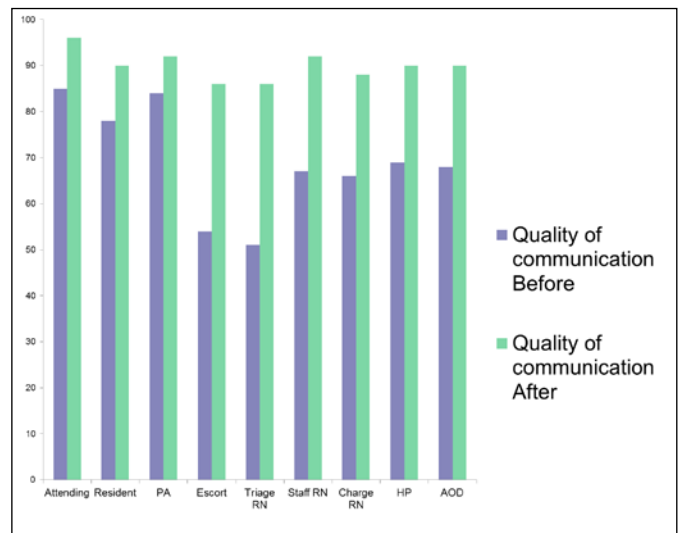
At greater than two years out, the trends seen early in dwell time, triage to provider time, triage to exit time, and patient walkouts continued to improve. The Press Ganey patient satisfaction scores for physicians during this time rose from among the lowest to a high of 90.0%, representing the highest value for any ED physician score (Figure 8). The patient satisfaction scores for overall ED satisfaction rose from the single lowest value in the corporation to 88.1%, also the highest in the corporation (Figure 9).

**DISCUSSION**

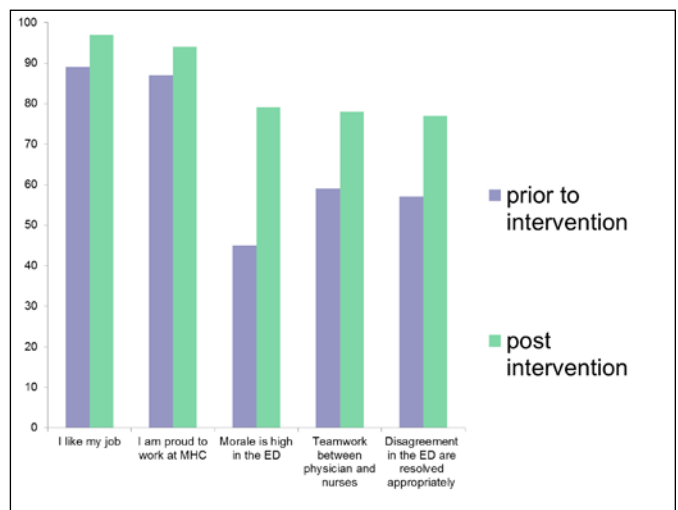
Interventions specifically addressed to improving staff satisfaction in the ED are infrequently discussed in the literature. Interdisciplinary rounding, or huddling, is commonly performed to improve patient safety, improve throughput, and increase patient satisfaction [3, 4]. Furthermore, a geographically-oriented, interdisciplinary team-based approach is increasingly used in emergency departments with impressive results [5]. Team leaders, in our case the attending physician or administrator on duty, reinforce policy and address issues as they arise [1]. While these studies address clinically important questions, there is no discussion of staff satisfaction. As staff satisfaction was the primary metric we aimed to improve, this is the first study that describes using huddles to create that change.

Huddles are an easy to perform task that can be instituted in any emergency department. In this case, huddling seems to encourage team-building, it allows all staff an opportunity to interact with administration, and it improves communication in the ED even when huddles are not occurring. There is a strong trend suggesting that huddling also decreases number of patients

**Figure 4. Staff Self-Reported Communication Quality**



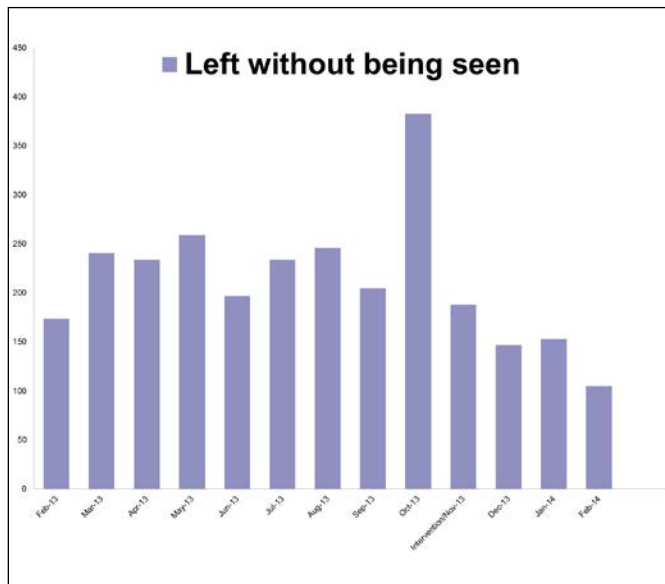
**Figure 5. Staff Self-Reported Satisfaction**



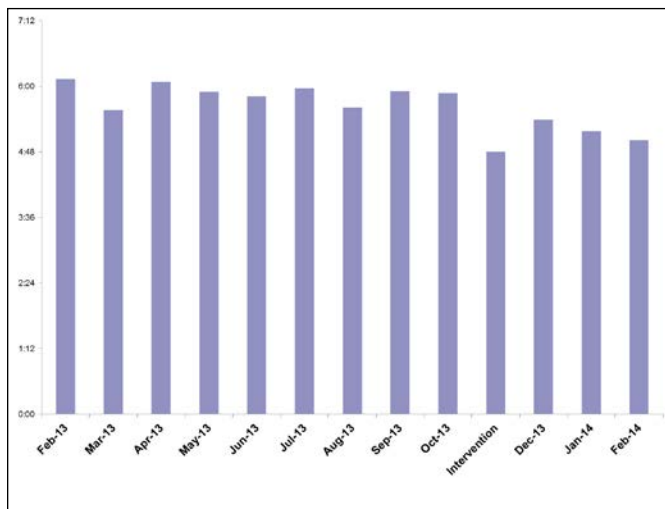
who leave without being seen, improves ED throughput, and improves general patient satisfaction.

In this current culture of patient empowerment and “doctor shopping,” patient selection can sometimes lead to negative patient outcomes. This gives a patient-centric reason for targeting high patient satisfaction. While patients may view their ability to leave and change hospitals at their whim positively, they are often unaware that they are disturbing both their continuity of care and their access to care. An ED that can satisfy their patients is an ED that will continually be able to connect a patient to their care providers who already know their medical history and to escalate care to different specialist level with less difficulty as the patient will have extant primary care history. By maintaining a continuity of care patients can avoid repeat or redundant testing. More generally speaking, a high patient satisfaction in the ED is key to creating a patient-centered medical home out of the hospital.

**Figure 6. Patients Left Without Being Seen Over Time**

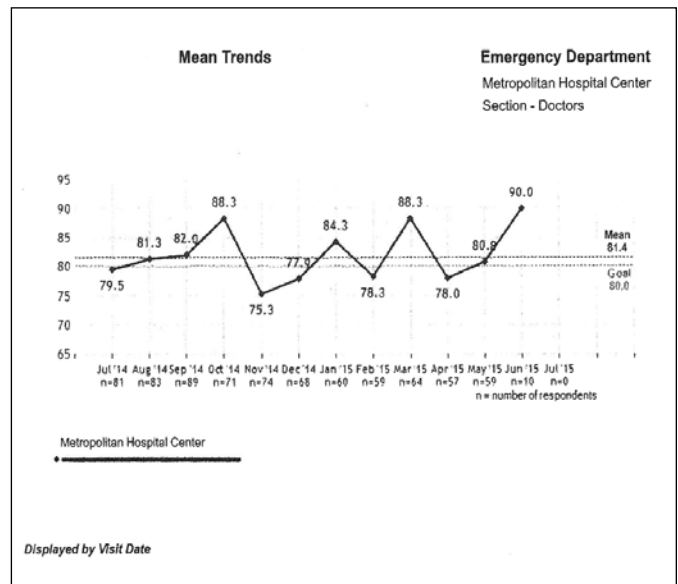


**Figure 7. Triage to Exit Time**

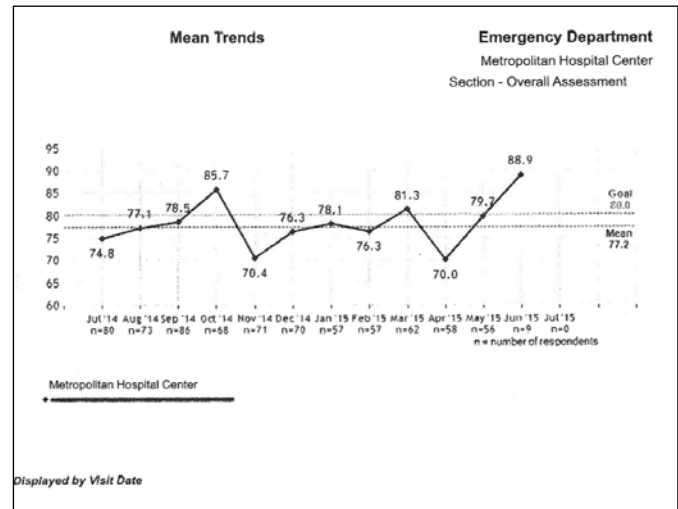


Since implementing this system, there have been multiple small cultural changes that have been born from permanently addressing repeated issues discovered during the huddles. While each individual change may have some impact on the change in culture seen, each of these changes were made because of the huddle system [2]. The near-total turnaround of the patient satisfaction and many of the patient-centric metrics appear to stem directly from implementing the huddles system and creating a more functional and cohesive ED clinical, administrative, and clerical team. While this model was used with great success in the ED, it does not have to be limited to emergency departments and with minimal modification of the checklists a targeted system of huddling could likely be implemented in most departments in need of improvement in functionality.

**Figure 8. Press Ganey Satisfaction Scores – Physician**



**Figure 9. Press Ganey Satisfaction Scores – Overall**



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# Creating a “Quiet Zone” for Safe Medication Administration at Metropolitan Hospital

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## ABSTRACT

**Introduction:** The purpose of this Quality Improvement (QI) project is to reduce distraction and interruptions during medication administration, create a culture of safety medication practice in order to reduce the medical errors. Employee and patient satisfaction greatly depend on careful monitoring and improving the medication administration process. Ultimately we want to demonstrate to other health care facilities how to initiate their own “Quiet Zones”, and to share with them what we learned during this process.

**Methods:** Over the period of one month, nurses were educated on the protocol by reviewing a checklist of things they would observe to ensure proper administration of medications. Also, all unit staff members were instructed not to interrupt or distract nurses administering medication unless the distraction is related to the medications being administered. Nurses were instructed to wear a Yellow Sash indicates “Quiet Zone”, students were trained to collect data and to monitor compliance and all staff members huddled at the end of the day to fine-tune concerns and develop the best practice for the project.

**Results:** Over the period of one month, the mean distraction rate was 22.3%, the number of distractions observed were different when comparing two different units to each other’s, while there was no difference when comparing each of them to control. The most common distraction consisted of interruptions from other staff and/or the nurse speaking about something not related to medication administration. The “Yellow Sash” and staff education do significantly decrease the number of distractions that a nurse encounters.

**Conclusion:** Our safety net hospital reflects what is seen nationally when it comes to medication administration. Nurses are distracted at a time which can impact on patient safety substantially. Adoption of a “Quiet Zone” during this sensitive time period is possible without an increase in the number of staff, results in fewer distractions and is welcomed by the staff. Our future plans as we continue in this pilot will be to re-survey the nurses to see if their perceptions have changed, and we will continue to collect data going forward to ascertain the impact this has on our culture along with checking for the project’s sustainability.

**Key words:** Medication Errors; Quality Improvement; Patient Safety, Interruptions

## INTRODUCTION

Medication Error (ME) is defined as any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of health care professional, patient, or consumer [1]. These types of errors can be caused by defects in the practice, products, procedures or the system. They may happen in any step from prescribing to distribution and use.

Medication Errors occur in 8.0% to 19.6% of doses in hospitals worldwide [2]. Although these figures should be

interpreted with caution due to the methodological variation in reporting medication errors, the fact remains the same; medication errors are common. In a review done by Kane-Gill and Weber about medication safety in the ICU, they reported a median of 105.9 medication errors per 1000 patient-days in adult ICUs, with a range of 1.2 to 947 errors per 1000 patient-days [3]. An attempt to get accurate number about MEs prevalence, a study was held in 36 institutions, 19% of the doses (605/3216) were in error, the percentage of errors rated potentially harmful was 7%, or more than 40 per day in a typical 300-patient facility [4].

Medication administration system failure is the most commonly identified reason for MEs, with distractions as the most common contributing factor [5-6]; hence the continuous search for a solution to this failure. A lot of solutions have been

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implemented; these solutions were highly effective at reducing unanticipated errors of commission in medication administration tasks [7]. The MAPS Study in the UK has used a mixed-methods ethnographic approach involving observational fieldwork, field notes, participant narratives, photographs, and spaghetti diagrams to identify system factors that facilitate and/or hinder successful medication administration in three inpatient wards and supplemented this with quantitative data on interruptions and distractions among other established medication safety measures [8]. The study concentrated on three interlinked causes for nurses’ distractions; system features, behavior types among nurses, and patient interactions. In a similar study in California [9], nurses were required to wear a bright yellow vest or sash when preparing and dispensing medications. In that 2-phase pilot study, nurses wore a construction style orange vest and medication errors were reduced 47% in a 5- to 6-month period. In a subsequent follow-up, nurses requested to change the color to yellow. In a 30-day follow-up period, medication errors were reduced 20%. The vest was implemented system-wide, helping the nurses’ ability to pass medications more efficiently and think more clearly.

Despite the great attention to this problem, MEs remains common mandating to work on solutions, in order to get used to reducing the distractions to the point it becomes a culture.

The “Quiet Zone” implementation is aimed to help to reduce the distractions and thus decreasing the overall MEs.

**METHODS**

Over the period of one month, nurses were educated on the protocol by reviewing a checklist of things they would observe to ensure proper administration of medications. Also, all unit staff members were instructed not to interrupt or distract nurses administering medication unless the distraction is related to the medications being administered. Nurses were instructed to wear a Yellow Sash indicates “Quiet Zone”, students were trained to collect data and to monitor compliance and all staff members huddled at the end of the day to fine-tune concerns and develop the best practice for the project.

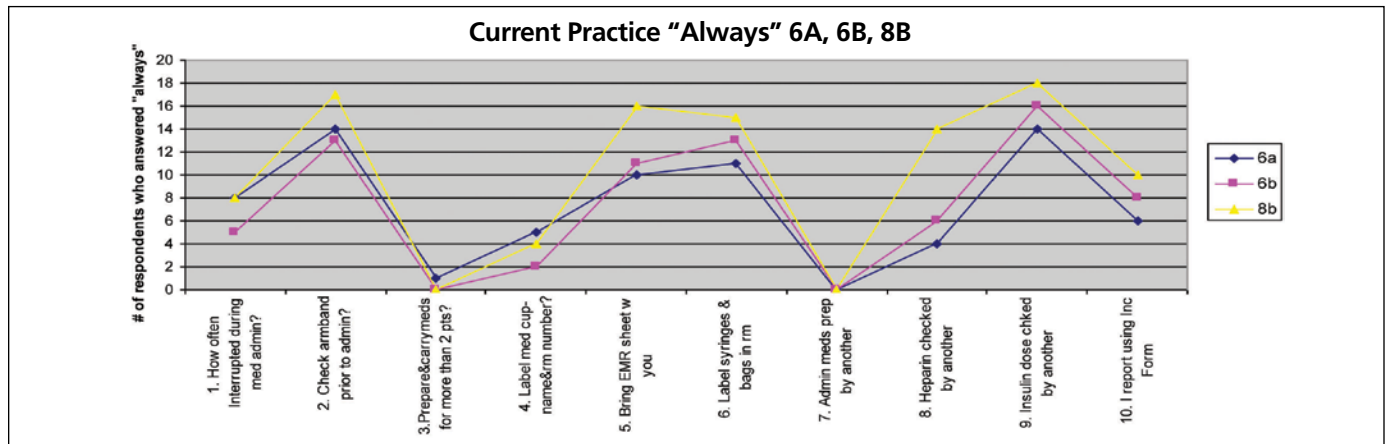
**RESULTS**

Over the period of one month, the mean distraction rate was 22.3%, the number of distractions observed were different when comparing two different units to each other’s, while there was no difference when comparing each of them to control. The most common distraction consisted of interruptions from other staff and/or the nurse speaking about something not related to medication administration. The “Yellow Sash” and staff education do significantly decrease the number of distractions that a nurse encounters.

**DISCUSSION**

**1. Are the floors we selected similar in their feelings on distractions? Are we comparing apples to onions?**

Yes, No



	6A	8B	6B
X	19.33	13.935	33.62
SD	27.796	18.921	19.385
N	20	20	20
Norm test p	.0102	.0127	>0.10
Passed normality test	no	no	Yes

Kruskal-Wallis Test (Nonparametric ANOVA)

**2. Was there a difference in the number of distractions encountered by the nurse on the three floors?**

**Yes**

We looked at the total number of distractions as witnessed by observers during medication passes each day. The number of distractions were divided by the number of observations for each day to give a percentage of distractions.

The P value is 0.0034, considered very significant. Variation among column medians is significantly greater than expected by chance.

When we drilled down, we found that there was no difference between 6A and 8B, the experimental arms, however there was a difference between the control group and each of the experimental floors.

Dunn's Multiple Comparisons Test	
Mean Rank	
Comparison Difference P value	
6A vs. 8B	3.375 ns P>0.05
6A vs. 6B	-13.875 * P<0.05
8B vs. 6B	-17.250 ** P<0.01

\*\*\*

**3. Did 6A and 8B, the experimental floors comply with wearing the sash equally?**

**Yes**

We took for each day the total number of times the sash was worn, divided by the total number of observations to get a score of how often the sash was worn for that day.

	6A	8B	6B
X	80.967	90.021	na
SD	26.164	24.062	na
Median	94.445	100	na
N	20	20	na
Norm test p	.0006	<0.0001	na
Passed normality test	no	no	na

The two-tailed P value is 0.1057, considered not significant.

\*\*\*

**4. Was there a difference between the floors in compliance with the two-patient identification policy?**

**Yes**

We looked at each day, the total number of checks, divided by the total observations for that day to get a score

	6A	8B	6B
X	89.886	86.8119	70.965
SD	24.594	19.793	26.809
N	20	20	19
Norm test p	<0.0001	<0.0001	.0259
Passed normality test	no	no	no

The P value is 0.0101, considered significant. Variation among column medians is significantly greater than expected by chance.

When we drilled down, we found NO difference between 6A and 8B, the experimental floors, and NO difference between 8B and 6B, BUT...

There was a difference between 6A and 6B

**Calculation detail**

Dunn's Multiple Comparisons Test	
Mean Rank	
Comparison	Difference P value
6A vs. 8B	5.050 ns P>0.05
6A vs. 6B	15.179 ** P<0.01
8B vs. 6B	10.129 ns P>0.05

\*\*\*

**5. Was there a difference between the floors on compliance with disposal of sharps?**

**No**

For each day we took the total number of properly disposed sharps and divided them by the number of observations for the day to get a score.

	6A	8B	6B
X	90.938	96.25	90.192
SD	17.215	8.322	15.952
N	20	20	20
Norm test p	<0.0001	<0.0001	<0.0001
Passed normality test	no	no	no

The P value is 0.3880, considered not significant. Variation among column medians is not significantly greater than expected by chance.

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**6. Was there a difference between the floor in compliance with the wash-in policy?**

**No**

We took for each day, the total number of compliant hand washing and divided that by the number of observations for that day to get a percentage of compliant hand washing

	6A	8B	6B
X	91.915	84.634	89.817
SD	23.392	25.899	11.137
N	20	20	20
Norm test p	<0.001	<0.001	0.0005
Passed normality test	no	no	no

The P value is 0.1717, considered not significant.

Variation among column medians is not significantly greater than expected by chance.

**7. Was there a difference on the three floors with the wash out policy?**

**No**

We looked at nurses washing out, taking the total number of washouts and dividing those by the number of observations to get a score

	6A	8B	6B
X	96.233	99.166	94.160
SD	11.693	3.727	16.174
N	20	20	20
Norm test p	<0.0001	<0.0001	<0.0001
Passed normality test	no	no	no

The P value is 0.2336, considered not significant. Variation among column medians is not significantly greater than expected by chance.

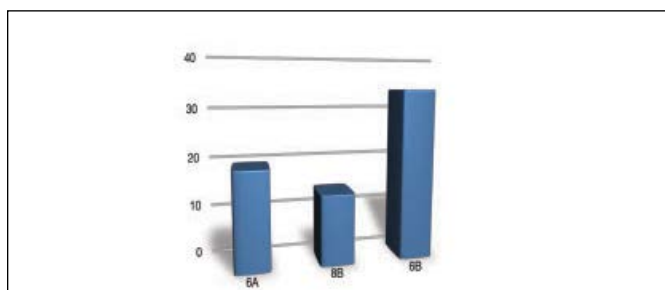
towards patient safety; the fourth section is about

**Data (Results/Outcomes):**

Over the period of one month

- 6A had a rate of 19.33% distraction
- 8B had a rate of 13.94% distraction
- 6B had a rate of 33.62% distraction

**Mean # of Distractions**



We then looked at a subset analysis comparing percentage of distractions on a daily basis for each unit. There was statistically significant differences on the floors. The number of distractions observed were different comparing 6A to control and 8B to control. However there was no difference when comparing the two experimental arms 6A and 8B together.

In checking of the arm band prior to administration, there was a difference when comparing 6A to control group. However there was no difference between 6A and 6B and no difference between 8B and control (unexpected)

There were no statistical differences in the groups with

- Compliance in washing in
- Disposing of sharps properly
- Compliance of washing out

We showed that the sash does significantly decrease the number of distractions that a nurse encounters.

**SUMMARY**

Over the period of one month 6A had a rate of 17.213% distraction. When looked at by AM and PM:

- 17.895% in the AM
- 14.815% in the PM

8B had a rate of 17.059% distraction. When looked at by AM and PM:

- 10.156% in the AM 38.095% in the PM
- 6B had a rate of 33.333% distraction

When looked at by AM and PM:

- 34.906% in the AM
- 28.947% in the PM

We then looked at a subset analysis comparing percentage of distractions on a daily basis for each unit. There was statistically significant differences on the floors. The number of distractions observed were different comparing 6A to control and 8B to control. However there was no difference when comparing the two experimental arms 6A and 8B together.

In checking of the Arm band prior to administration, there was a difference when comparing 6A to control group. However there was no difference between 6A and 6B and no difference between 8B and control (unexpected).

There were no statistical differences in the groups with

- Compliance in washing in
- Disposing of sharps properly
- Compliance of washing out

We showed that the sash does significantly decrease the number of distractions that a nurse encounters and that 6A does a more consistent job of checking arm bands than does the control group.

The data suggests that 8B had a higher percentage of distractions in the afternoon than in the morning. However it should be noted that data collection in the PM had significantly fewer observation than the morning and was noticed to not be as well regimented as the morning medication passes.

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## Transforming Lives Through Education in the Diabetes Resource Center

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### ABSTRACT

The Diabetes Resource Center (DRC) at Kings County Hospital places great emphasis on patient education. The DRC serves a population of patients who are learning to manage their disease despite educational literacy and financial obstacles. The staff at the clinic works closely with patients to navigate the challenges of diabetes within the New York City public support systems offered by HHC, food pantries, food stamp programs, etc. The clinic staff teaches patients and their family members to take ownership of the disease and be responsible for self-care. The staff sees diabetes care and education as a multidisciplinary field that requires participation from many areas within the hospital.

**Key words:** Diabetes; Self-Care; Self-Efficacy; Hba1c; Education; Insulin; Patient

Nestled on the 9th floor of the B Building is a hidden gem of patient care at Kings County Hospital Center. It is the home of the Brooklyn-Kings Diabetes Self-Management Education Program, also known as the Diabetes Resource Center (DRC). The program has been an American Diabetes Association Recognition program since 2004. It is the place where a multidisciplinary team of healthcare providers transform lives.

We have a patient, whom I'll call F.M., a 59 year-old Afro-Caribbean woman with long-standing uncontrolled diabetes, who graduated from our program with the highest percentage of decrease in her Hba1c. (Hba1c is a blood test measuring glucose level. The average for a healthy person is 4.0% to 5.6 %.) F.M.'s journey to self-management began with a scheduled appointment in our clinic where her labs showed that her diabetes had been out of control for quite a long time. When I asked her about her knowledge of diabetes, she said only, "I know what the doctor tells me," but she was unable to articulate her diabetes management plan or her own goals for improving her health. After explaining that diabetes is a progressive disease, I asked her how long she wanted to live and in what condition. She told me she had grandchildren whom she was helping to raise and wanted to see them grow up. We then discussed how she could prevent complications that she was approaching due to

her uncontrolled diabetes. We agreed that she would give herself an insulin dose while in the clinic to treat her elevated glucose level. We invited daughter, sitting in the waiting room, into the exam room to serve as the support person. Upon hearing her new medication regimen, the daughter immediately said she did not want her mother to take any insulin, claiming it was dangerous. She firmly told her mother that she heard insulin would make her die sooner. I discussed her mother's clinical data and, with her mother's permission, showed them both how long the diabetes had been uncontrolled. The numbers and the length of time shocked them both. After explaining the acute complications of hyperglycemia and hypoglycemia, I asked the daughter if she had prepared her five-year-old to help her mother if something happened to her in the home while they were alone, and she admitted she hadn't. After 45 minutes of discussion, they both agreed for F.M. to try insulin. After the mother administered the dose, she laughed because the injection was not painful. They were able to see a decrease in her blood glucose before going home. The patient returned to the clinic a week later for follow up and was ecstatic that she was beginning to see her blood glucose levels lowered with her insulin use. I invited her to attend the Diabetes Resource Center for further education.

The mission of the Brooklyn-Kings Diabetes Self-Management Program is to provide comprehensive healthcare management, screening, and education for patients with diabetes, their significant others, and caregivers in a courteous efficient environment, thereby empowering them to enhance self-management of their disease. This is a challenging, but exciting and fulfilling feat.

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In the U.S. there are 29.1 million people diagnosed with diabetes and 8.1 million are unaware that they have the disease. (1) In 2013, 1 in 9 people in New York City were living with diabetes. (2) Kings County Hospital Center has approximately 8,000 patients in its diabetes registry. We are a microcosm of New York City, both with widely diverse populations. As clinicians, we look at clinical data as it relates to the patient and approach patient care as healers. As educators, we view patient care with a more qualitative approach. The self-management education program provides the participants with the “yes” of diabetes self-management care. We approach diabetes care as navigators, healers, and teachers. We employ the American Association of Diabetes Educators (AADE) 7 Self-Care Behaviors™ healthy eating, being active, monitoring, taking medications, problem solving, risk reduction, and healthy coping. Diabetes can be treated and managed by healthful eating, regular physical activity, and medications to lower blood glucose levels. (3) At Kings County we work with a vulnerable, yet resilient population. Many of our patients are immigrants who came to New York City for a better life and greater opportunities. Many of them have diabetes or know someone who does. Patient education and self-care practices are vitally important aspects of disease management that help people with diabetes stay healthy.

Diabetes disproportionately affects low-income and racial/ethnic minorities, and there is an urgent need to improve the quality of care and lower the rates of avoidable complications for these populations. Patients with diabetes are expected to perform daily self-management activities to help avoid diabetes-related morbidity and mortality. Self-management is a cornerstone of diabetes care, and it is believed that improving patient self-efficacy is a critical pathway to improved self-management. (4)

F.M. lives with her daughter, a single mother of two, who works long hours. F.M. is responsible for the household work and childcare. She has some authority regarding the home, but her daughter makes most of the decision, including her mother’s clinic visit schedule, the food she cooks and eats, the medications she takes, and her physical activities. M.F has been completely dependent on her daughter, who had been enabling her mother’s diseases. Not only did F.M. suffer from a number of chronic diseases, she also had low educational literacy and healthcare literacy, meaning the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions. Health literacy is dependent on individual and systemic factor. (5) Neither F.M. nor her daughter understood the complexity of living with diabetes. They did not understand that diabetes is a progressive disease that needs to be aggressively addressed. They did not understand the cost of caring for the disease in terms of finances and time, or the possible extensive

medical complications. They certainly did not understand the role of medication for treating the disease. Within the patient population we serve at Kings County Hospital, individuals with limited health literacy are especially vulnerable to these experiences. A growing body of research demonstrates that limited health literacy, a prevalent problem in vulnerable populations, is independently associated with poor self-rated health, higher utilization of services, fewer preventive services, worsening glycemic control, and more diabetes complications. Therefore, self-efficacy may be a relevant determinant of self-management behaviors among populations with limited health literacy. (6)

At first, F.M half-heartedly came to our teaching sessions. She had problems getting out of the house as she usually left only to drop her grandchildren off at school and attend church services. At the first class she sat in the back of the room and crossed her hands over her chest as if protecting herself from us. When all the class participants introduced themselves, she mumbled her name and the reason she was in class. When interacting with other students she would only nod when something seemed right to her and frown when she heard something that touched her nerves. At the end of the first class, I asked if she would return and she mumbled “I’ll try.”

The staff identified this patient for “extra touches” we called her between classes to keep her engaged. By slowing down and clearly communicating, doctors, nurses, and educators have more success in helping patients learn to treat themselves.(7) As the classes continued, we engaged the students using culturally sensitive terms and broke down pathophysiology into simple terms, knowing that effective care begins with an educated and activated patient (8). Blood glucose became “sugar,” hypoglycemia was “low sugar,” hyperglycemia was “high sugar,” neuropathy was “nerve damage,” and monitoring was “checking finger sticks or blood sugars.”

We demonstrated glucose and insulin with visual clues (balls and colored pins) and demonstrated how they functioned in blood cells. We had food models that the participants could easily identify food they ate every day to show portion control and how to make healthy choices. In low-income neighborhoods, external barriers, such as the scarce availability of recommended fresh foods may limit patients’ abilities to follow lifestyle recommendations. (9) This is an important point when teaching patients who share living spaces or are living in the shelter system. These participants are taught to make the wisest choices from among the options they are given. A participant may have to choose between canned string beans and canned corn. In this instance, label reading and portion sizes is stressed. F.M. was able to exchange yam, bananas, and plantains by the end of her session with the dietician. Following the medication class, she was able to identify

ways of remembering to take her medications, how to store her insulin safely, and how to secure medication refills. She created a sick-day plan, taught her grandchildren what the plan entailed, and posted it on the family's refrigerator. Week after week, she became more engaged in the class and even began to speak to a few classmates. She continued to keep her appointments with her primary care provider and the specialty clinics. She even began to teach her daughter how to care for her as a person living with diabetes, and her daughter became much more supportive, rather than an enabler of her disease. F.M. was finally self-managing her diabetes and other chronic illnesses.

The overall goal of putting the patient at the center of the process is a new method of care delivery. In the past, the doctors told the patients what to do and the patient followed the doctor's advice, rarely asking questions. When the care plan did not fit the patient's lifestyle, many patients simply stopped following it. Making the patient the center point of the process changes all that. Interaction with health care providers can be challenging (10), so providers need to confirm that their recommendations are understandable and reasonable. By doing so, there is an increased probability of adherence to medical advice, while minimizing its impact on quality of life. Patient-centered care has been shown to improve the health of people with chronic conditions, including diabetes (11).

In the DRC, another critical part of diabetes management is the focus on reducing cardiovascular disease risk factors, such as high blood pressure, high lipid levels, and tobacco use. Patient education and self-care practices are important aspects of disease management that help people with diabetes stay healthy. SMART (Specific, Measurable, Attainable, Relevant, and Time-bound) goals are used to promote different approaches to behavioral changes. If a participant has an elevated blood pressure, we provide self-management education and goal setting for hypertension in addition to the diabetes training. In disadvantaged populations, a variety of experiences and barriers may undermine self-management performance, including comorbid conditions such as depression or chronic pain, patient-physician communication problems, and economic barriers such as the cost of glucose test strips or medications. (12)

Embedded in the DRC education program is an Advanced Practice Nurse (APN) who is responsible for adjusting medication, offering, medical nutritional therapy, and establishing an exercise regimen. Patients are also given a referral to follow up in the nurse-led hypertension clinic if their blood pressure remains uncontrolled. We perform standard depression screening and follow-up care established by an embedded Collaborative Nurse.

This "warm hand off" encourages patients to start engaging in care and follow up regularly with their primary care providers. Knowing that the entire staff of primary care is interested in their well-being becomes the extra handholding some patients need for them to self-manage. The contributions of the diabetes educators, dietitians, and other non-physician personnel are invaluable in providing patients with needed information in a somewhat less-formal and less time-pressured setting (13)

By the sixth week of class, F.M. told the staff, "You changed my life!" We hadn't realized how much until we saw the fruits of her labor and our efforts at her graduation from the course. She was acknowledged for the greatest decrease in HbA1c she went from 12.1% to 6.4%. The joy of her story came from her sharing with us that she had never before been in a formal school setting coming to class and sitting in a classroom with other students was a completely new experience for her. She acknowledged the feeling of accomplishment when she was asked questions about diabetes and had the right answers or she when could explain how she solved a problem. One year later, she maintains her HbA1c <7%.

This transformative process take place one patient at a time. Those who cannot reach their goal or whose lives get in the way of their living with their diabetes learn through attending this program that they are not alone. We adhere to an open-door policy where they can drop in at any time when they need coaching or assistance with their care plans. We at the DRC are invested in having a healthier community, so we chant the mantra of "each one, teach one." Our patients share ways of finding a balance between the task of self-management and a variety of everyday life accomplishments and how they successfully manage their diabetes. (14)

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## Revisiting the Bottom-Up Approach to Quality Improvement: Let Us Not Skip Any Rungs on the Ladder

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### ABSTRACT

Quality is a perception based on expectations set forth by stakeholders. At hospitals, those stakeholders are usually cited as including patients, payors, and the administration. Clinicians and other employees who make up the healthcare team have traditionally been left out of this definition. If we are truly going to improve hospital outcomes, decrease mortality, and ultimately enhance the patient experience, we must emphasize teamwork along with learning and patient-centered care to allow for this advancement through a quality culture. The failure to adopt these requisites for quality care thwarts our progress and limits our success. As it currently stands, physicians and nurses are stepping up more avidly to identify and improve our systems and processes. Who we often exclude from this dialogue are the countless other members of the healthcare team ranging from hospital foodservice personnel to homecare workers who can valuably contribute to a truly bottom-up approach to quality improvement. Shared here is a perspective on building movement that empowers every hospital worker to own their stake in the effort to deliver high quality care.

**Key words:** Bottom-Up Initiatives; Quality Improvement; Patient-Centered Care; Patient Care Team

Through immersion, what I discovered most recently is not only my own myopia but a problem of exclusion that runs rampant in our healthcare system: we restrict our thinking to our own cohort rather than including other members of the hospital workforce as agents delivering high quality and safe patient care. How many times do we consider empowering our food service personnel to help patients understand that the meal they are being served is a part of the healing process? When do we take the time to engage the home care worker so she/he can be informed enough to help our patient make healthy decisions at away from the hospital or clinic? In what way do we try to encourage our certified nursing assistants to make their bedside observations count in positively affecting the patient's health trajectory?

By not adopting an inclusive approach to healthcare delivery, the only person we are hurting is the patient. Admittedly, I have been a culprit here as well because I'm rarely thinking outside this circle we as clinicians draw around ourselves. Still, I am confident that my recent journey detailed below will help adopt new practices and also lead by example on this front of inclusion.

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As the representative of fourteen thousand physicians in training at various teaching hospitals across the country, I make use of opportunities to attend and partake in discussions around patient safety and quality care at our hospitals. I have wanted to ensure that residents and fellows are being incorporated in the process of policy change and creation at our own institutions as well as the global changes that are taking place. Moreover, I am keenly interested in ensuring that hospital leadership recognizes the value that front-line providers, including residents and fellows, can bring to the table when it comes to identifying and vetting new approaches to patient care.

Just last month, I attended two separate and geographically distinct conferences on quality of care. During the first, I found myself amidst a crowd of some of the strongest names in healthcare, both on the management side with CMOs and CEOs as well as the labor side with top ranking officers. Among us 40 or so attendees, we represented 50 million patients and a hundred thousand care providers. Needless to say, there was a lot of pride in the room. Later in same week, I felt equally honored to be in a similar sized room with a similar sized crowd with a diverse group of leaders representing hundreds of thousands of care workers as well. The faces changed from one conference to the next, but the theme couldn't have been more common: the health care system should adopt a culture of quality and patient safety.

During the latter conference, a set of conversations emerged

and as points of view became apparent, I recognized that despite their attempts to participate in corporate decision making, many hospital workers feel disempowered to do so. I realized that this is going on at hospitals that serve our most vulnerable populations. As I sat there listening to the ongoing and valid concerns, I couldn't help but reflect on Patrow's depiction of the group I know best: resident physicians as the "invisible doctors" who also traditionally had not been given any role in quality improvement [1]. That was in 1993, and I have to admit that for this group, quality improvement has since become far more rampant in our vernacular. In fact, for even those are less familiar with or inclined toward quality improvement, the regulatory authorities who oversee our education and training are mandating our recognition and participation [2]. Whether it is the ACGME or the ABIM or a similar body overseeing the practice of medicine and emphasizing the role of the physician in quality improvement and patient safety, it is happening [3]. There are many examples of quality and patient safety initiatives that have emerged organically and are resident led [4]. These examples highlight the collaborative nature of a partnership between hospital executives and front-line providers. There are also a few examples that illustrate the more top-down approaches and have met with some success [5]. Collectively, this work demonstrates a shift in culture where even the newest kids on the block (resident physicians), by virtue of our training timeline, are given a voice on matters of policy at our hospitals.

I recognize this is a real step forward for resident physicians, but what about the rest of the members of the "healthcare team" who being given this opportunity to volunteer and certainly aren't being mandated to partake in similar initiatives. Of course they are feeling less and less a part of any team. These hundreds of thousands of certified nursing assistants, hospital food service professionals, and home care workers who have even more face time with patients than resident physicians are an untapped resource in our equation that is supposed to deliver quality.

Let's consider the haggard patient who has been kept NPO for two days after a battery of tests. What more will she cherish than a meal that is delivered to her bedside that evening. Returning from her colonoscopy what she gets is a low sodium, carbohydrate controlled, and low fat puree – she is not likely to be happy. Imagine now the interaction with the food service worker who has been confined to the role of delivering the meal and naturally deflecting the patient's discontent to the all-too-familiar adage "doctor's orders". Instead of being told to blame it on the doctor, how different would a conversation be for the patient if she heard from the foodservice worker that "the meal is actually a part of the healing process"? It is no secret that patients often view doctors as elitist or as figures who cannot understand their patients. While

that may or may not be true, I cannot think of a strategy to better attend to our patients where everyone involved in the care of that patient be equipped with prompts that remind the patients each component of the prescription is part of a path to recovery and a healthier lifestyle. This means that the patient hears this message from the nursing assistant or from the security guard at the door just as she hears from the doctors.

As the debate continued at this conference, I was again enlightened by the epiphany that we often forget that good health does not begin or end during an acute hospitalization episode. In fact, if population health is to be valued as much as it should, then we need to be maximizing its potential. Through my years of involvement with The Committee of Interns and Residents (CIR SEIU Healthcare), I have learned that young doctors in our union have been at the vanguard of this movement to instill healthier habits in the children of the communities we serve through an initiative that started in the public schools near our hospitals in the Bronx [6]. Kids are benefitting from this type of community intervention [7], so how do we do the same for adults? Achieving the latter is not as great of a challenge as it may seem. Yes, most of our adult patients are not school-going individuals, but the many of the most vulnerable are attended to by homecare workers.

If the goal is better outcomes in patient care, we must think of the patient as a whole and we cannot forget about the patient when he leaves the clinic. The care must continue at home – even for those who don't have a spouse or other loved one to cook their meals or to help them exercise. Many of them do have homecare workers, a force that is over 800,000 strong and continues to grow [8]. By integrating these direct-care professionals into the healthcare infrastructure, the link between the patient and physician is maintained. Interventions can be more timely, and outcomes can be far better than where we currently stand. I learned just recently that homecare workers in some regions of the country are being equipped with digital devices which allow them remain in contact with the patient's family members [9]. One would expect that these same devices could enable the homecare workers to track and transmit health and diet data back to the doctor.

As clinicians, we want to implement systems and practices which help avoid errors and bad outcomes both inside the hospital and under a patient's own roof. But thinking of the healthcare team more broadly calls for a revolutionary change in culture. A shift in thinking of this magnitude requires our institution's leaders to actively endorse and ardently encourage input from members of the healthcare team at different rungs of the ladder – not just from those towards the top.

Of my peers I ask that as the youngest generation of physicians, we should help shape policies at our hospitals and clinics



by adopting a more inclusive team approach. Together, we can bring back into focus our patients who deserve a care team that works across the ranks to improve quality and enhance safety collaboratively.

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## Informed Consent: Current Practical Issues

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### ABSTRACT

An 'Informed Consent' comprises a thorough description of an intervention, its adverse effects, the alternative options and the possible outcomes thereof, which help the patients or legal guardians to understand clearly about the intervention and take a wise decision. In some circumstances 'Informed Consent' can lead to a dilemma or legally alarming situation. Several issues like competency of the patient while signing the 'Informed Consent' form, how much the patient has understood the conditions of the 'Informed Consent', the rapport between the doctor and patient established while obtaining the 'Informed Consent'. As a solution, we suggest that the doctors explain the complications as thoroughly as possible and the non-medical employees in a health care organization such as social workers, and patient navigators also be involved to assist patients in making more sensible and wise decisions on the contemplated intervention as well as providing them with mental support.

**Key words:** Informed Consents; Patients; Physicians

Informed consent is not only a legal document that summarizes what doctors and patients or legal guardians discuss regarding an intervention but also includes the process of helping patients or legal guardians understand and subsequently decide whether or not to participate in the intervention [1-3]. The document is not limited to the description of the intervention or its potential risks and benefits but also explains the rationale for doing the intervention and the possible alternatives considered [4, 5].

However, in some clinical situations, it is not easy to get the informed consent. In patients' viewpoint as well as doctors', there are some practical issues that we should try to look into. To illustrate the point, let us consider the following case scenarios:

**A** is a clerk in a grocery store. He has never studied any topic in healthcare. One afternoon, he gets a phone call from the hospital. His only brother is in circulatory shock and lost consciousness after a traffic accident and the hospital asks him to come to the hospital. He panics. He does not know what to do and cannot understand how this kind of thing could possibly happen to his

brother. He rushes into the emergency room where the doctors are waiting for him with the informed consent. They tell him many things in a short time, but the words confuse him and he cannot understand. He does not understand what is going on and he feels like he should say 'yes' and sign the informed consent. In this situation, is it appropriate to ask him to sign on the 'informed consent' immediately? Will he comprehend later what doctors told him in that situation? Of course, his brother is in critical condition so he feels that he does not have any choice but to sign the documents. However if his brother's condition worsens after the intervention, he might feel guilty and blame the doctors for asking him to sign on the informed consent. Could we have done more in this kind of situation? Did 'A' get emotional support before signing on the informed consent?

**B** feels the sudden onset of severe abdominal pain. He is sweating profusely and even breathing gives him pain. He rushes to the hospital where doctors examine him and order pain medications that relieve his pain a little bit but not completely. He is still in severe pain and asks for more pain medication. Some doctors come up to him and explain his situation and suggest a treatment option. Because of the pain, he could not pay attention to what they are telling him. All that he wants is relief of his pain as soon as possible. He signs on the 'informed consent' form and asks them to do something for his pain. In this situation, a patient in severe pain, is the informed consent still valid? This patient is not a fully competent patient. Could we do

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more in this situation to help him to make his decision?

**C** received a craniotomy to stop intracranial bleeding two days ago. He has been receiving continuous high dose of Fentanyl infusion for pain control since then. Most of the time, he has been sleeping. Today in the morning, doctors come to the bed side. His parents are with him. The doctor explains to him and to his parents that he needs another craniotomy for ongoing bleeding control. He seems like he is awake, everybody thinks that he is awake at the time. Even his parents think that he can decide. The doctor asks him to sign the 'INFORMED CONSENT' which he does. He goes back to his sleep right away after that he does what the doctors want him to do. In this situation, will he possibly remember what he did later on? Can the patient who has been on high doses of analgesics or opioids possibly make their own decision?

**D** is a high school teacher with a master's degree. His daughter was diagnosed with systemic lupus erythematosus (SLE) one year ago. When he and his daughter visited clinic yesterday, the doctor mentioned that it seemed like his daughter's kidneys have an ongoing problem and that she needs a kidney biopsy for further treatment. The father asked for more information and the doctor explained more in detail but the father did not understand completely. The doctor gave him a video file of the information. 'D' went home and watched the video but the video had only general information - not specific to his daughter's condition. 'D' looked on the internet website but all the information was not specific to his daughter's case. Is there any one that he could ask freely and more comfortably? He feels that he should say 'yes' when he meets the doctor again. However, he wants to speak with someone who is not a doctor, knows his daughter's condition, and has knowledge of SLE kidney disease.

**E** is a general surgeon at a tertiary center. Everyday his schedule is filled with all kinds of work. One day he met with one of his patients to obtain INFORMED CONSENT for an acute appendectomy. He explained the possibility of postoperative complications such as: wound infection, perforation, abscess formation, ileus, surgical injuries to internal organs, gangrene of the bowel, and peritonitis. The patient agreed to appendectomy and signed the 'informed consent'. Unfortunately, after the patient underwent appendectomy, he was diagnosed with septic mesenteric venous thrombophlebitis, a rare complication of acute appendicitis. The patient complained that nobody told him about this complication before and that he would take a legal action. The surgeon explained to the patient that this is very rare complication and apologized that he did not explain this before. The patient and his family did not want to listen to him.

To what extent should doctors explain the complications that can happen? There are numerous complications or side effects after all the procedures and diseases. Should doctors explain

the things that can rarely happen? During obtaining informed consent, doctors explain common complications or adverse events. They mention that unexplained rare complications can happen after procedure. However, in case unexpected situations happened that were not expected, the doctors are blamed for not telling the patients about that particular complication in detail. Should doctors be blamed and be held responsible legally for that kind of situation? Is there any specific rule on mentioning unexpected complications and how extensively they should be discussed to protect physicians legally? Furthermore, if doctors explain all the side effects or complications that could happen, no patient might like to get that intervention.

In conclusion, doctors and patients should discuss all the complications as much as possible regarding the intervention before the patient signs the 'Informed consent'. The decision should be made on the basis of the patient's or the proxy's understanding of the intervention that is about to take place. However, doctors could still encounter some dilemma. Sometimes, the patient or the proxy may not ask more questions to the doctors or they might feel that it is difficult to say 'no' to the doctors because they might think saying 'no' to the doctors could make the doctors angry.

There are many social workers, patient navigators and case managers working in different fields of medicine. We wonder whether there is a hospital where healthcare workers could help the patient understand the informed consent, give some emotional support or clarify decisions as well as protect doctors from legal suits related to the 'Informed Consent'. Is there any third party who is not a doctor who could be involved in getting an informed consent? As doctors, we have learned the importance of the informed consent and also tried to do our best in clinical situations that involve some dilemma as mentioned earlier. Such situations need to be addressed to prevent confusion.

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## The Rise of Synthetic Cannabinoid ED Visits: A Quality Improvement Initiative

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### ABSTRACT

The rapid and detrimental increases of “Synthetic Cannabinoid Receptor Agonists” (SCRA) usage among patient population in New York City has become a severe care delivery burden in the Emergency Departments of the hospitals. From the year of 2011 to 2015, Metropolitan Hospital has observed an alarmingly uprising number of documented SCRA cases increasing from 2 to 166 respectively. As the patients with SCRA intoxication presents with bradycardia, hypotension, altered mental status and aggression and vulnerable to hemodynamic collapse ; they are needed to be held under observation in the ED which leads to more nursing staffs engagement as well as optimization of more health care resources like other high risk patients. A Community organized education and motivation can play an essential role to prevent such kind of “Abuse Epidemic”. Also the respective physicians can collect information about the unbanned formulations of the “Synthetic Cannabinoid” from the patients, reporting these to the Poison Control Network and contribute in banning these products.

**Key words:** K2; Cannabinoid; Drug; Patient Safety; Emergency Management

### INTRODUCTION

As health care providers (HCPs) in New York City, the use of synthetic cannabinoid receptor agonists (SCRAs) in our patient population has rapidly increased in frequency over the past two years. The symptoms associated with SCRAs parallel the symptoms associated with Gamma Hydroxybutyrate (GHB). Commonly observed by HCPs during the outbreak of GHB in the early 90’s, were neurological symptoms of confusion, ataxia, combativeness, euphoria, and amnesia. Use of GHB also frequently results in hypotension and bradycardia, with higher doses causing respiratory depression and circulatory collapse [1].

GHB is known to work at the GABA-B receptor, unlike commonly used sedatives including ethanol and benzodiazepines that work at the GABA-A receptor. SCRAs also inhibit GABA, albeit via a different mechanism, predominantly involving agonism of the CB1 receptor. One of the newly identified compounds in SCRAs is [1-(5-fluoropentyl)-1H-indol-3-yl] (4-methyl-1-naphthalenyl)-methanone (MAM-2201). In

addition to causing a concentration-dependent suppression of GABA release, MAM-2201 also suppresses glutamate release at Purkinje cell fibers [2].

SCRA ingestion results in a plethora of psychotropic effects including delirium and hallucinations. SCs also have the propensity to elicit combative, agitated and aggressive behaviors requiring patients to be sedated with benzodiazepines and antipsychotics. At our institution, SCRAs have also been documented to cause concerning levels of bradycardia and hypotension, which can be worsened by instituting sedative agents for agitation. Thus, many SCRA abusers require continuous cardiac monitoring and pulse oximetry. Such requirements place a significant burden on the emergency department (ED), by necessitating higher levels of nursing staff acquisition and prolonged observational periods in the ED. At our institution, the recent increases in SCRA users have contributed to an overall increase in ED crowding. The phenomenon of ED crowding in general is associated with a 5% higher chance of death, 1% longer hospital stay and 1% higher costs per admission [3].

It is well documented that the number of SCRA-related cases identified by the ED of our institution has exponentially increased in frequency over the past four years. Between June and September 2011, our institution documented 2 cases suspicious for SCRA intoxication. By the summer of 2012 (June to September) the number of cases increased to 4 documented ER admissions and 2 cases highly suspicious for SCRA intoxication.

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In the winter of 2013 (January to May) a total of 8 ED admissions were documented SCRA users. Forty-five cases of Synthetic Cannabinoids aka K2 or spice intoxication were seen between June and September 2013, which increased to 78 cases in the summer of 2014 (June to September). In September 2014 alone, there were 76 documented cases of SCRA use, sometimes more than 5 EMS arrivals of K2 users per day, mostly due to patients' altered mental status. One patient was a 68-year old male brought in by EMS post syncopal episode while smoking SCRA. The patient was noted to have symptomatic bradycardia with a heart rate of 43 bpm and was admitted to the Coronary Care Unit (CCU). Another 49 year old male was noted to have prolonged QTC with T wave inversions and was placed in observational status in the hospital. Three additional patients were placed under observational status for syncope and collapse without bradycardia. Three patients were noted to be tachycardic and diaphoretic with heart rates ranging from 109-139 bpm. Two patients were admitted to psychiatry in September 2014 for aggressive, belligerent behavior following sedation and observation in the ED for several hours. One of the patients remained in the psychiatry unit for 5 days for observation and optimization of medication regimen. Most recently, in April 2015, there were 166 documented SCRA admissions in our ED. Eleven of those patients required inpatient admission for persistent altered mental status in the ED, arrhythmias and respiratory infections, including aspiration pneumonitis. There was one admission to the Medical Intensive Care Unit (MICU) during this period for continued seizure activity. One patient was also admitted to the CCU for non-ST segment elevation myocardial infarction. Similarly in June 2015, there were 113 documented SCRA cases presenting to our ED.

A recent study by Trecki et al, reported 17 deaths out of 1200 ED visits due to SCRA intoxication in Mississippi between mid-March and May 2015. During this period the Alabama Department of Health had reported 1000 ED visits from SC use with 5 deaths [5]. These recent death rates from SC substances are especially alarming when comparing data from the World Health Organization (WHO), which reported a total of 60 deaths in the United States between 1990 and 2006 due to GHB intoxication[6]. Synthetic cannabinoid receptor agonists are certainly resulting in large numbers of ED admissions with definite concern for cardiovascular compromise and death. There were

2 reports of death from SC substance XLR-11 ((1-pentyl-1H-indol-3-yl) (2,2,3,3-tetramethylcyclopropyl)-methanone). This synthetic cannabimimetic compound, is not part of the 15 known controlled SC substances currently legislated. Under post-mortem blood analysis, positive results for this compound were found in a 29-year old female and 32-year old female following SC intoxication and subsequent death [4]. Other SCRA substances identified in post-mortem cases have included: AB-CHMINACA, MAB-CHMINACA, AB-FUMINACA and ADB-PINACA [5].

Given the recent epidemic of SCRA abuse, associated with increasing ED admissions and an appreciable risk of adverse outcomes and death, there remains a continued need for hospital resources to monitor and manage these hemodynamically unstable patients. We are required to place as much emphasis on SCRA intoxicated patients as other high-risk patients presenting to the ED, and it remains imperative that we maintain a very low threshold for hospital admission, especially for patients with limited hemodynamic improvement and continued mental status changes. Community-based education and intervention is of paramount importance and remains the only resource left to help control current trends in SC abuse and prevent the development of future SCRA users. In addition, treating physicians should take initiative to ask patients about the type of SCRA used and report cases to Poison control networks, so that new SCRA compounds can be identified and appropriate legislative bans can be enforced.

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## Ethical Dilemmas in Teenage Confidentiality

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### ABSTRACT

Patient's confidentiality has become an enormously debatable issue in pediatric health care now a days. "Confidentiality" and on the other hand, "Breach of the confidentiality" for the sake of supervising the patient's physical and mental wellbeing by the parents is immensely confronting each other throughout the pediatrician's decisions frequently. Giving the idea to parents about child's high risk behavior which can lead to severe impairment of physical and psychological condition causes the violation of law but in some certain circumstances may hinder the child from being in danger. Some case histories are mentioned below to address these types of situations specifically. Besides physicians delivering information about common risky behaviors to the parents in general, the school counsellors and social workers should also be involved in this process as their availability to the children and parents can be optimized further.

**Key words:** Ethical Dilemmas; Teenage Confidentiality; Sexually Transmitted Disease

Privacy is defined as the ability of the individual to maintain information in a protected way. Confidentiality in health care is the obligation of the health care provider. The provider must not disclose protected information. Minors' confidentiality is protected under the Family Educational Rights and Privacy Act (FERPA). FERPA was first enacted in 1974 and amended in 1994 under the Improving America's School Act (IASA).

There are certain situations where there is an ethical dilemma. Disclosing the information to parents can lead to violation of law, but withholding information from them might lead to lack of supervision over the teenager and might cause serious or permanent harm. [1, 2] What should we do in these situations? Let's analyze a few examples.

A 17 yr. old boy comes to your clinic for a well adolescent visit. You ask about his habits, attitudes and mental health, and during the conversation, he mentions that tonight he is going to participate in a motor cycle race on the streets, which you realize is not only illegal but also dangerous. You somehow convince him to wear helmet and use other protective equipment but you are not sure if he is going to use protective gear or not. Efforts to convince him to not participate in this race are in vain. He has

not told his parents about it because he thinks that they will not allow him to go there. You know that there is a possibility that he may end up in an emergency room tonight and may even have something as serious as a life-threatening head injury or a spinal injury that may leave him disabled for rest of his life. What should you do in this situation? You think that if your child is in such a situation, you would want to know. Should you inform his parents? If not then should you inform the police who would be able to prevent this race from happening? Will telling lead to breach of confidentiality?

A 16 yr. old girl who is a regular patient of yours comes to the clinic for burning micturition. As you talk to her you realize that she is sexually active with multiple partners and never uses any barrier contraceptive or take any birth control pills. She is at a very high risk of contracting sexually transmitted diseases like HIV/AIDS, Gonorrhea/Chlamydia and also is at risk of becoming pregnant. During the last visits you had counselled her repeatedly regarding these risks and safe sex practices but she has not changed her habits. Referral to Adolescent health and a counsellor hasn't worked either. You know that if she were to develop any of these deadly diseases or were to get pregnant, it would change her life forever. You also know that her mother is quite stressed about her change in habits and falling grades at school, but the mother doesn't know about her multiple partners and risk taking sexual behavior. What more can you do in this situation? Is it necessary to discuss her situation with her mother and involve her or will this be a breach of confidentiality?

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A 14 yr. old boy is seen in the clinic during routine visit. His parents express concern regarding his changing mood and falling school grades. You ask his parents to step out of the room to give him privacy to discuss whatever he wants. While counselling him about sexual health and practices, you realize that he has unrestricted access to internet and frequently watches pornographic videos. He is addicted to watching sexual content and this is adversely affecting his outlook towards life, his performance in school, and how he interacts with his peers. You know that if he continues this behavior it will have serious implications in the future - not only for him and his family but also to society in general. You know there is a strong evidence that online sexual addiction is associated with inability to develop relationships, loss of interest in relationship sex/couple sex, increased rate of divorce, adverse effect on children of an addict, increased rate of sex crimes, and child sexual abuse. It can also lead to increased incidence of anxiety and depression in these individuals. You counsel him over these issues. He is not comfortable in discussing these issues with his parents himself. What more do you think can be done for him? Do you think you should tell his parents and restrict his access to internet? You think that he will be thankful to you in the long run because this would help him to have more wholesome relationships and a happy life, but you are concerned about the breach in confidentiality. What can you do to strike a balance in such a dilemma?

A 15 yr. old high school student comes to your clinic for regular visit. During routine assessment he asks about adverse effects of some recreational drugs like cocaine and marijuana which he has tried a couple of times recently. He is not yet addicted to any of the drugs but is at a very high risk of substance abuse due to peer pressure. He tells you that this weekend he is going to his friend's place to try a few other drugs that he has not experienced. You counsel him about adverse effects of IV drug abuse and drug abuse in any form in general. ? Should you refer him to a counsellor? Is this enough? What if he becomes a victim of drug overdose and comes to ER. What more should be done in this case? Should his parents know about this? You know that other children in his school are at increased risk of drug abuse. Should you inform the school counsellor or school principal about this situation or will this lead to breach of confidentiality? Will this lead to loss of trust between the physician and patient. [3]

16 yr. old female comes to clinic for health care maintenance visit. You look at her you and feel that she is not her usual self. Upon further questioning you find that she is depressed due to her troubled relationship with her boyfriend and consequent poor performance in school. She says that she has been feeling this way for last 6 months. Besides referring her to a psychiatrist, what else should be done for her? Will she benefit if you tell her

parents about her situation and get their emotional support? However this will lead to breach in confidentiality. What if she develops suicidal thoughts in future? Suicidal ideation has to be reported to parents but do we have to wait until that time? Is it safe to wait until that time? What if she never talks about suicidal ideation to anyone before attempting suicide? [4]

Every situation is unique and requires a different approach. Should the guidelines be followed without exceptions to specific situations or should we be allowed to have more flexibility in following the guidelines?

I believe that parents should be informed and counselled about all common risks that their children might be exposed to. This will serve as an acceptable solution which will not require specific breach of confidentiality, but will also make them more vigilant in supervising their children.

Involvement of a counsellor and a social worker in such situations can also play a very important role in tailoring the care and guiding these teenagers, as doctors might not be able to go into more details or have more frequent follow ups due to their busy schedules. This can be done by means of periodic group meetings between parents and school counselors.

Let us think more about such difficult situations and come up with more solutions.

Please email your opinions and suggestions to the email add: [drprajakta2007@gmail.com](mailto:drprajakta2007@gmail.com)

## EXPERT OPINION

### By Dr. Gilberto Velez-Domenech, Chief of Adolescent Medicine at New York Medical College

Health care providers very often confront serious ethical dilemmas in the course of caring for their teenage patients. As pubertal development and maturation progresses and the ability of adolescents to understand information increases, parents have a moral obligation to honor the adolescent's specific perspective, which may lead to conflict between the parents' notion of what is best for the teenager and the teenager's own view of what is best for himself or herself.

The challenge for health care providers is to follow a clinical path that exercises professional fiduciary care of the adolescent patient while respecting parental authority and adhering to legal and administrative underpinnings. Along this path the provider should be able to exercise his or her individual right of conscience. This process generally demonstrates compassion and may involve a compromise, but it always demands genuine care for the adolescent patient. The health care provider's responsibility is to the patient who asks for his or her help and the physician needs to honor that relationship even in the face of substantial challenges.

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## Going Back to Basics: Respect in Healthcare

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### ABSTRACT

Even though the explanation of “Respect” differs in various cultures, race, age, relationships or circumstances, it is a very basic moral element that is inserted in people’s mind through parents, family and society. Respect is an expression of esteem. On the other hand disrespect refers to small range of disregard to aggression. Respectful behavior has taken an essential place in healthcare system and delivery for creating a better health related outcome. Accepting the patient as a person of honor and autonomy is a crucial part of a respectful encounter to a patient. Lead by example, Live by golden rule, Listen and Standard communication are four specific principles to establish a respectful professional environment in a healthcare organization. Any range of disrespectful behaviors are the important factors to cause a vulnerable situation which can adversely impact the patient health status. So as going back to the basics, respect to patients as well as colleagues and other team members always contribute to develop a successful and more influential healthcare system day by day.

**Key words:** Respect in Healthcare; Respectful Behavior; Respectful

Respect is a fundamental moral value that has been instilled in us by our parents and generations before them. It is a touchy subject, since it differs in different cultures, race, age groups, relationships, and situations. The definition of respect varies depending on how you use it. Respect is characterized by specific actions and conduct that demonstrate esteem. In essence, respect is an attitude. Disrespectful behaviors take many forms, ranging from subtle disregard to aggressive behaviors. Over time these behaviors can become embedded in the culture and many times unrecognized. It is pivotal in healthcare for both the medical team and the patients to view respect as a core value. Disrespectful behaviors threaten organizational collaborative cultures, patient safety and transparency.

In healthcare, disrespectful behaviors have created heated discussions and has forced regulators to dive into these concerns. The Joint Commission issued a Sentinel Event Alert #40 – *Behaviors that Undermines a Culture of Safety* in 2008. The Joint Commission wrote in the guidance, “To assure quality and to promote a culture of safety, health care organizations must address the problem of behaviors that threaten the performance of the health care team.”

Intimidating and disruptive behaviors can foster medical errors, contribute to poor patient satisfaction and adverse outcomes, increase the cost of care, and force the members of the healthcare team to seek other professions. Disrespectful behavior has led to loss of trust, strong negative emotions, and loss of focus in healthcare.

Lucian L. Leape, MD, a founder of the National Patient Safety Foundation, said “A substantial barrier to progress in patient safety is a dysfunctional culture rooted in widespread disrespect [including] ... disruptive behavior; humiliating, demeaning treatment of nurses, residents, and students; passive-aggressive behavior; passive disrespect; dismissive treatment of patients; and systemic disrespect [1].” He observed that disrespect among hospital employees is “a threat to patient safety because it inhibits collegiality and cooperation essential to teamwork, cuts off communication, undermines morale, and inhibits compliance with and implementation of new practices.”

Respecting others is a silent way to express our feelings about them. When a person shows respect for someone, it means that the person values him/her. The awareness of respect must be instilled in our healthcare team, as well as acknowledging the value of each team member including patients and families in healthcare outcomes. It is time to incorporate respect as an essential attribute, along with integrity and compassion. Respectful behavior will promote satisfaction in the work place and foster the willingness to share information. It can also promote patients to be engaged

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in their care and increase adherence to treatment. It is our professional and moral obligation to acknowledge *patients as persons with values and autonomy*.

Gary S. Kaplan, MD, chairman and CEO of Virginia Mason Health System in SEATTLE (June 11, 2013) said, “respect must be shown every day, at all levels of our organization, for us to provide the best care and a perfect patient experience. If our physicians, nurses and other team members don’t feel valued and respected, this will affect their ability to put the patient first in everything we do [2].”

Respectful behavior is an intentional choice we make each and every day. Disrespectful attitudes and behavior can impede upon delivering the paramount care our patients deserve.

The respect for patients, colleagues and other team members impacts the outcome of care delivered and that necessitates our immediate attention, since the future state of healthcare depends on it.

The four simple principles in building a respectful workplace are:

- Lead by example: If you respect people around you and other see that, it will inspire them to do the same. Disrespectful behavior from leaders is caustic to an organization and a team environment. This certainly impacts quality, safety, patient experience, and other important factors in healthcare organizations.
- Live by the Golden Rule: Treat others the way you want to be treated.
- Listen: Open your ears and keep an open mind. Give your undivided attention when someone is speaking. Everyone wants to be heard.
- Standardized communication: Utilizing Team STEPPS (Team Strategies and Tools to Enhance Performance and Patient Safety) to develop common language and enhance a respectful culture.

Healthcare can no longer remain silent or make excuses for disrespectful behaviors. A culture of safety cannot be achieved if patients and clinical teams don’t feel respected. Patients should not be victims for our inability to be respectful to one another, as there is a clear link between disrespectful behaviors and adverse outcomes. Let’s get back to the basics and be respectful in the workplace and work as a team to care for the patients and each other. There are no room for big egos in healthcare. Keep patients first!

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## Overview of Psychiatric Patient Safety Issues

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### ABSTRACT

Important differences exist between the field of psychiatry and other medical specialties, and perhaps for this reason, some aspects of patient safety in the hospital setting may be overlooked or underrepresented. Patient safety and risk are topics deserving of attention, especially within hospital-based psychiatric units where the looming threat of injury is not unexpected because the standard for civil commitment is based upon “the likelihood to harm self or others”. This article aims to explore some of the issues surrounding patient safety specific to the inpatient psychiatric population, however it may also have important implications at hospitals possessing a large number of patients with psychiatric comorbidity. Topics unique to the psychiatric population include, physical aggression towards staff or between patients, self-injurious behavior, and even suicide. Preventative measures are taken by hospitals, staff and physicians in order to increase the safety of patients, however what seem like inevitable incidents of harm on inpatient units raise the question – what more can be done to prevent them?

**Key words:** Inpatient Psychiatry; Harm; Aggression; Suicide; High Risk

There is a strong prevalence of harm on inpatient psychiatric units as compared to other medical units. Events resulting in patient injury, whether self inflicted or assaultive, are unfortunately a reality on many inpatient psychiatric units. In regards to physical aggression, often a small number of patient are responsible for a large number of incidents [2,12]. Estimates of aggression on inpatient psychiatric units are 10-15% of admissions. Although an infrequent occurrence, completed suicides have also taken place during hospitalization, and estimated at a prevalence between 0.1% and 0.4% of all psychiatric admissions [7]. Of the 35000 suicides which take place every year in the US, 1800 or 6% occur during an inpatient hospitalization [15].

In order to mitigate this known risk of harm, it is important to begin to assess risk factors upon admission. In line with the ideals of preventative medicine, predicting risk for suicide or aggression while hospitalized is foremost in minimizing it and therefore maximizing patient safety, although this can prove to be challenging. Generally, risk factors for suicide or aggression are similar whether inpatient or otherwise, with the most valuable predictor of future suicide attempts or aggression being a past suicide attempt or history of aggression. If unknown to

an institution, patients may be evasive regarding their history and therefore not readily identified as potentially dangerous to themselves or others. Some studies have identified suicidal ideation or self-harm as the biggest predictive factor for inpatient suicide, while others have indicated that the majority of patients denied prior to the act. According to a case controlled study of 92 inpatients who committed suicide, 78% denied suicidal ideation prior to the act, again creating a challenge in identifying at risk individuals [3]. Paradoxically, another study determined that voiced suicidal ideation was more common in those who did not kill themselves in comparison to those patients who actually did [8].

Various tools for assessing aggression have been developed. Most well known are the History Clinical Risk (HCR-20), Psychopathy Checklist (PCL-R and PCL-SV), and the Broset Violence Checklist (BVC). The BVC is six variables, of which at least two must be present to be predictive of short-term aggression (within 24 hours). Two recent studies conducted in the UK, attempted to determine the predictive validity of the HCR-20, for inpatient aggression and for inpatient self-harm. Correlation was found for certain demographics and clinical groups. Specifically, in the study concerning inpatient aggression, in which gender, diagnosis, ethnicity and age were considered, the HCR-20 predicted aggression better for women than men and for those with diagnoses of schizophrenia and/or personality disorders [13]. The other study, by the same group of authors, also used the HCR-20 in determining its efficacy for prediction of

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self-harm while hospitalized. It also demonstrated a relationship between self harm and aggression towards others, explicating also, that those who were self injurious were more likely to engage in outward violent behavior, especially in younger females [14].

Beyond identifying patients at risk for violence or self-injury, the precipitating factors for aggression should be considered. Psychopathology has long been linked to violence. Psychosis, mania, personality disorders, substance abuse, organic brain disease, or some combination of the above, have all been associated with impulsivity as a prominent symptom [9]. Not surprisingly, anger is an important predictor of violence, evidenced by studies utilizing self report anger scales in correlation with acts of misconduct. It is also an important component when it comes to the progression from delusions to violence [11].

Narrowing in on triggers, both general and patient specific, prior to a patient escalating is useful in avoiding potentially dangerous situations. Lack of productive activity on inpatient units may lead to boredom amongst vulnerable patients, increased irritability and subsequent “acting out.” Perhaps a relationship also exists between the number of patients on the unit at once and frequency of incidents, or the ratio of support staff to patients. The level of experience and frustration tolerance of staff members in dealing with psychiatric patients also plays a role in frequency of violent events.

Timing of occurrences while hospitalized is also an important parameter to consider, and potentially an area for targeted improvement when attempting to reduce incidents and increase patient safety. Qin et al, discovered two sharp peaks of risk for suicide around psychiatric hospitalization. The first, one week following admission and the second, within the first week after discharge [16]. Identifying when patients are at greatest risk could allow staff to take extra precautions at the beginning of admission and detailed discharge planning and follow up for patients for historically suicidal patients.

In addition to patient history and assessment instruments, static and dynamic risk factors are useful predictors for violence, and important to be aware of when developing treatment plans. Static are those which are unable to be altered, for example, gender, intelligence, mental illness diagnosis, and history of weapons or military training. Dynamic factors are ones which can be modified to improve outcome such as psychiatric symptoms, substance use or access to dangerous objects while hospitalized [1].

In an effort to mitigate the known risks on an inpatient psychiatric unit, environmental interventions are implemented to ensure patient safety. For one, access to potentially hazardous items are limited. These include obvious items such as shoelaces, belts and sharp objects. Patients are required to tend to personal hygiene such as shaving in a supervised setting. Despite precautionary

measures, contraband or use of seemingly innocent objects to create damage is always a possibility.

Another common strategy to fortify patient safety in psychiatry is one-to-one or close observation of specific patients by a staff member. Still, data shows that even patients on 15-minute nursing checks have successfully completed suicide, the majority by hanging [10]. Of 76 patients who committed suicide either while on the unit or immediately after discharge, 51% of them had been on either 1:1 observation or every 15-minute monitoring [3].

The use of four-point restraints, although controversial, is still used in acute care settings. This measure, which is meant to be used as a last resort, when a patient is deemed to be a danger to self or others, comes with risks of its own, and if not used appropriately, can result in physical or psychological harm to the patient being restrained. As with any treatment option, the risks and benefits of restraints must be considered by the clinician.

The role of psychotropic medications while hospitalized is another area worth investigation in regards to suicidal or aggressive behavior while hospitalized. Certainly targeted treatment of depression with medication could decrease risk of suicide while hospitalized, however discrepancy lies in that antidepressants often take weeks to reach therapeutic effect while patients are at greatest risk at the beginning of hospitalization. Furthermore, many antidepressants warn of increased suicidal ideation, especially in the first few weeks of initiation. Even still, only two medications have significant evidence proving decreased risk for suicide – the antipsychotic clozapine and mood stabilizer, lithium.

The California state Hospital Violence Assessment and Treatment (Cal-VAT) guidelines seek to provide comprehensive guidelines for the treatment of aggressiveness, by first determining its etiology and tailoring psychopharmacologic and social interventions to suit. Three categories of violence are outlined as psychotic, impulsive and predatory aggression, each of which has been associated with different psychopathology. Psychotic aggression is hallmarked by misinterpretation of environmental, while impulsive aggression is an emotionally charged reaction that results in loss of control over behavior. Predatory aggression, which does not involve autonomic arousal as the other two do, is centered around a premeditated plan to orchestrate violence, likely with a lack of remorse and goal directed. The Cal-VAT advises that in identifying the type of aggression, it can be better treated, and in turn improve outcomes [17].

Patient safety in all areas of medicine is an ongoing concern, and issues specific to the psychiatric population must be considered. Identifying and treating patients at higher risk for self-harm or physical aggression toward others is especially pertinent at hospitals wherein a substantial number of patients belonging to an array of services have a psychiatric history.

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**CASE REPORT**

## A Patient Safety Approach to Recurrent Stroke Occurring During Acute Inpatient Rehabilitation

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**ABSTRACT**

Stroke is a common cause of disability in all age groups. Recurrent stroke can occur in a small percentage of patients while admitted in acute inpatient rehabilitation. To the best of our knowledge, there is no known established treatment approach in the literature for rehabilitation of a recurrent stroke that has occurred while undergoing acute rehabilitation. Traditionally a patient sustaining recurrent stroke occurring while undergoing acute inpatient rehabilitation is transferred to the intensive care unit or medical ward interrupting the recovery process. There is no doubt that hemodynamically unstable patients would benefit from such care but hemodynamically stable patients transferred to medical floor for recurrent stroke lose their valuable time for rehabilitation and are prone to develop complications secondary to immobility. As demonstrated in our case, a multidisciplinary team approach during acute inpatient rehabilitation in a hospital setting can safely manage hemodynamically stable recurrent stroke patients with early mobilization, manage stroke related complications, and stroke related work up like brain MRI and other specialties referral like neurology, cardiology, and psychiatry. This can reduce morbidities related to stroke, improve functional recovery faster, may prove to be cost effective, and reduce hospital stay in this patient population.

**Key words:** Patient Safety; Stroke; Rehabilitation

**INTRODUCTION**

Stroke is the second most common cause of mortality and third most common cause of disability worldwide [1]. The frequency of medical complications during inpatient rehabilitation among patients with stroke has been reported to range between 48% and 96% [2]. Incidence of recurrent stroke during inpatient rehabilitation varies from 1.6% - 2.8% [2, 3]. To the best of our knowledge, there is no known established treatment approach in the literature for rehabilitation of a recurrent stroke that has occurred while admitted to acute rehabilitation unit. Traditionally a patient sustaining a recurrent stroke occurring while undergoing acute inpatient rehabilitation is transferred to the intensive care unit or medical ward interrupting the recovery process. There is no doubt that hemodynamically unstable patients would benefit from such care but hemodynamically stable patients transferred to medical floor for recurrent stroke lose valuable time for rehabilitation and are prone to develop complications secondary to immobility [7]. We present to you

a case of hemodynamically stable recurrent stroke occurring during acute inpatient rehabilitation in a hospital setting, which was safely managed by a multidisciplinary team approach.

**CASE PRESENTATION**

78 years old female with past medical history of recently diagnosed uncontrolled hypertension presented to our emergency department with confusion, slurring of speech and right-sided weakness. Brain computerized tomography (CT) demonstrated zones of hypo attenuation in the posterior parietal and occipital lobes, indicating an acute vs sub-acute infarction. The patient was not given tissue plasminogen activator (tPA) as she was out of the therapeutic window. NIHSS on admission was 3 and modified rankin scale was 2. Repeat brain CT findings 18 hours later demonstrated evolving small to moderate infarction in the left parietal convexity and in the left occipital lobe. Additional work up included Carotid Doppler, which demonstrated right mild plaque in External carotid artery/Internal carotid artery (ECA/ICA) junction with less than 50% stenosis; the left ICA had a severe plaque causing more than 70% stenosis. Echocardiogram demonstrated left ventricular ejection fraction >55% and grade I diastolic dysfunction. Patient's stroke was assumed to be due to severe left ICA stenosis evident on the carotid doppler. Once

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medically stable, patient was transferred to acute inpatient rehabilitation unit four days after stroke.

Patient initially made good progress in therapy. The therapist indicated "Bed mobility minimal assistance, upper body (UB) dressing minimal assistance, lower body (LB) dressing maximal assistance, Utilizing a yellow and blue weighted ball Patient functionally ambulated around table twice with steadying assistance, ambulation with rolling walker 75 feet x 5 trials with moderate assistance. Patient required minimal assistance with bed to wheelchair, sit to stand and wheel chair to mat transfers." Until this point patient tolerated three hours of rehab except for one day when she missed 30 minutes.

On day 5 of admission to acute inpatient rehabilitation unit patient complained of worsening right-sided weakness and numbness and had an episode of knee buckling while walking. There was no gross change in the neurological exam.

On day 6, therapists noted, "Since initial evaluation patient exhibits decreased right upper extremity strength/coordination, decreased attention span and ability to follow commands, decreased eye contact, less engaged with session, maximum assistance required for all transfers, required maximum assistance to ambulate 5 feet on parallel bars, patient wanted to terminate therapy early due to fatigue." Repeat examination on the same day did not demonstrate any new changes except on command, patient was unable to get out of the chair even though she said she is showing effort. A recurrent stroke was suspected. CT brain was ordered which did not show any hemorrhage or new infarct.

On day 7, patient continued to perform at the same functional level. Patient continued to complain of decreased energy and fatigue. Patient was noted to have depressed mood, refused to see rehab psychologist saying there is nothing wrong with her. Psychiatry team was consulted and depression was ruled out.

On day 8, MRI brain was recommended by neurology, findings were: sub-acute infarcts in Left Anterior cerebral artery (ACA), posterior cerebral artery (PCA), middle cerebral artery (MCA) and right anterior cerebral artery territory. The recurrent stroke was highly suspected to be embolic in nature. Since our patient was hemodynamically stable and following commands she was not transferred to the medical ward.

Patient continued to participate in rehabilitation as tolerated while further work up was being done to rule out the etiology of the recurrent ischemic strokes. Transesophageal echocardiogram (TEE) ruled out Patent foramen ovale. A 24-hour cardiac event monitoring demonstrated no arrhythmias. Hyper-coagulable work up was unremarkable. Patient complained of anxious mood. Psychiatry was re-consulted who diagnosed her with panic attacks. Patient was started on Celexa 10mg daily. Patient reported improvement in mood and gradual improvement in fatigue and

subsequently was able to tolerate 3 hours of rehabilitation. Patient continued to have on and off numbness and weakness in the right upper and lower extremity. Computed tomography angiography (CTA) neck was recommended which revealed a more than 99 percent stenosis of the left internal carotid artery. Meanwhile our patient gradually progressed functionally. In view of severe left internal carotid artery stenosis patient was transferred out of our hospital for carotid endarterectomy. After the procedure patient was discharged home with family with outpatient rehabilitation recommendation.

Function at discharge on day 22 was ambulation of 70 feet with rollator walker and moderate assistance. Patient was modified independent with bed mobility with use of rail. Patient required minimal assistance for supine to sit. Contact guard assistance was required for sit to stand. Patient also required minimal assistance for wheelchair to mat transfer. Lower body dressing with minimal assistance was needed and toilet transfer with maximal assistance was needed.

Since family was willing to provide assistance patient moved in with her family. At six week phone follow up patient reported participating in home physical and Occupational therapy. Patient is independent with eating, grooming, UB and LB dressing, toileting, needs assistance with bathing. Patient continues to have mild weakness in the right lower extremity.

## DISCUSSION

Early mobilization within 24 hours is the guidelines in many countries; however the results are inconclusive in terms of efficacy [6]. A large multicenter randomized controlled trial evaluated the efficacy of very early and aggressive mobilization versus early and less intense mobilization, which concluded that very early and aggressive mobilization is not superior in terms of motor recovery and might be more harmful, however the dose-response relationship is not defined and mobilization protocol changed significantly during the trial [6]. 93% patients in the early and less intense mobilization group were mobilized within 48 hours [6]. Patients with recurrent stroke were also included in this study. Despite these results early mobilization within 24 hours continues to be the standard of care. Patients with recurrent strokes have similar functional gain as somebody with a first stroke [4]. Hemodynamically stable recurrent stroke patients have the advantage of receiving early mobilization within 24 hours in acute inpatient rehabilitation unit, while having work up done if necessary. MRI brain by itself is inconclusive as to whether it was a recurrent stroke but clinical correlation with MRI is highly suggestive of a recurrent stroke in our patient. A limitation in this case is that a baseline MRI on admission would have been helpful in determining nature of recurrent stroke,

silent versus new embolic. Patient was not transferred to medicine ward because of hemodynamically stable status, and availability of close neurological follow up. While in acute inpatient rehabilitation, besides participating in rehabilitation, patient received routine nursing care, rehabilitation physician supervision, care from physicians across other specialties like neurology, cardiology, psychology and psychiatry, and work up was done to rule out the etiology of stroke. It is very likely that our patient had post stroke fatigue, which is more common in patients with recurrent strokes [8]. Post stroke fatigue is an independent predictor of functional outcome [9, 10]. Post stroke fatigue can have multiple etiologies and it can be managed by a multidisciplinary approach, which targets physical, cognitive and emotional aspects [11]. Our patient was also diagnosed to have panic attacks likely due to adjustment disorder and was treated effectively with multidisciplinary approach, which involved family support, supportive psychotherapy and pharmacology. Thus a multidisciplinary team approach during acute inpatient rehabilitation in a hospital setting is also helpful in managing stroke related complications.

## CONCLUSION

As demonstrated in our case, a multidisciplinary team approach during acute inpatient rehabilitation in a hospital setting can safely and effectively manage hemodynamically stable recurrent stroke patients with early mobilization, manage stroke related complications, and stroke related work up with other specialties referral if necessary. This can reduce morbidities related to stroke, improve functional recovery faster, may prove to be cost effective, and reduce hospital stay in this patient population. Further studies evaluating recurrent acute stroke occurring while undergoing acute inpatient rehabilitation may help guide best practice for caring toward this population.

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**CASE REPORT**

## Awake Fiber Optic Intubation in An Extremely Obese Patient

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### INTRODUCTION

Difficult airway management is one of the cornerstones of anesthetic practice. It often entails the use of helpful personnel, appropriate medications and necessary resources and equipment. One of the burdening factors that make securing an emergent and difficult airway even more complicated is morbid obesity. We present such a case in which an awake fiber optic intubation was implemented safely in a patient with imminent respiratory failure. Another key factor that is highlighted by this presentation is the importance of interdepartmental communication.

### CASE REPORT

A 48 year old extremely morbidly obese male (BMI 81 kg/m<sup>2</sup>) presented to the ED with difficulty in breathing. He was known to have been admitted multiple times in the past for respiratory failure. His past medical history included OSA, HTN, Pickwickian syndrome, DM type 2 and CHF. The patient was closely monitored in the ED with hourly ABG's that revealed worsening respiratory acidosis and hypoxemia despite use of NIPPV. The anesthesiology service was informed early on so that appropriate planning can be made to secure the airway if need be. The patient was subsequently admitted to the ICU for close monitoring. Given that there was no improvement in his condition, the patient was to be transported to the OR for intubation, and possibly, for a tracheostomy per ENT service. Transporting the patient proved to be quite a difficult feat and it was decided the he was to be intubated at bedside with ENT service present.

### METHOD

Given the patient's condition, consent was obtained from the patient's mother. Pre-oxygenation was instituted via BiPAP with FiO<sub>2</sub> of 1.0. Topicalization of the oropharynx was achieved with Lidocaine 4% and sedation was achieved with Precedex (total of



80 mcg titrated slowly). A lubricated 7.5 Fr oral ETT was loaded on the fiber optic scope. An oral airway was placed in the patient's mouth, the fiber optic scope guided through the vocal cords and advanced into the trachea with the ETT. Proper positioning of the ETT was confirmed with the fiber optic scope upon its retrieval.

### DISCUSSION POINTS

This case highlights the importance of communication in any team setting, namely when airway security is a major factor and accessibility questionable. Rarely if ever, does this type of interdepartmental communication and cooperation prove to be detrimental to patient safety. Extrapolating the course of care of a patient and anticipating complications can be difficult, but it is simple and convenient to alert specialists who may potentially need to be involved, and maintain effective communication.

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In this situation, the ED and ICU teams coordinated thorough monitoring and cohesive care from early in the course. The ED team informed the anesthesiologists early of a difficult airway, and they in turn brought in ENT for support and possibly back up. This simple action demonstrates the ideal relationship between services leading to better patient safety and fewer adverse outcomes.

The use of the oral airway during placement of the ETT may be controversial, but its functionality as a bite block seemingly outweighed its risks in this situation. Deep sedation and general anesthesia are known to increase the propensity for airway obstruction and collapse, generally a result of increased upper airway reflex sensitivity. In multiple studies, dexmedetomidine had minimal effect on airway cross-sectional area.[2] Additionally, the use of only dexmedetomidine preserved spontaneous ventilation but allowed for adequate sedation for successful tube placement. As a selective alpha-2 agonist, approved by the FDA in 2008 for procedural sedation, dexmedetomidine offers potent sedation with some analgesia, better intubation conditions, preservation of airway patency, reduced patient recall of intubation and minimal respiratory depression in contrast to most sedatives [1,3]. These traits make it ideal for fiberoptic intubation in the setting of a difficulty airway. Its applications are

growing as it is expanding into pediatric procedural sedation and diagnostic imaging.

The coordinated efforts subsequently included multi-departmental efforts in preventing oral edema and other foreseeable complications, both acutely and in the setting of follow up. This patient ultimately underwent an elective tracheostomy five days later and was discharged without any major sequelae. Learning from our successes is as important as from our deficiencies. We hope this type of communication and multidisciplinary coordination, coupled with proper use of procedural sedation and technique, will foster and encourage further similar practice within our institution and beyond.

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