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King Saud Bin Abdulaziz University for Health Sciences

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Message from the Forum President

H.E. Dr. Bandar Al Knawy

It is my pleasure to welcome you to the Annual Patient Safety Forum 2017. Over the last 6 years, the Forum has been a great success in bringing quality and patient safety into a visible platform that attracts thousands of health care professionals to learn from leaders in the field.

The international and regional experts share their knowledge and experiences with health care professionals in the region. The Forum is leading the advancement of health care delivery sciences by providing a venue for regional professionals to share their work and exchange ideas. This is evident by the increased number of abstracts submitted to this meeting.

The submitted abstracts has doubled over the last two years with significant improvement in the submission quality and content.

On behalf of the MNGHA staff and all the teams who worked diligently to make the Forum a great success, I would like to thank all the authors who submitted abstracts to the Forum and welcome all participants and attendees and wish you all a fruitful and a productive experience.



Dr. Bandar Knawy

CEO, MNGHA

President, PSF 2017

Message from the Chairman of the Scientific Committee

Building safer healthcare with minimal harm is a core component of quality care. This is a difficult task. Despite the complexity of care and frustrations, patient safety continues to progress.

We have achieved remarkable improvements in specific defects and harm involving sepsis, hospital-acquired infections, surgical adverse events, and pressure ulcers. The lethal central line-associated bloodstream infections are history in many intensive care units. However, sustained whole system improvements are few. This sustained improvement requires addressing the more difficult implementation of an engaged visible leadership, a culture of safety, and transferring healthcare organizations into a learning health system. We need to move beyond successful projects to integrating patient safety within each component of the healthcare system, each setting of care, and across the continuum of the patient's pathway.

The next phase of patient safety requires pursuing a systems approach that includes creating an environment of psychological safety, just culture, team work and communication, and conflict resolution. It further needs leaders to promote and mentor teams and establish a learning system based on transparency, evidence and reliability, improvement science, and continuous learning. This phase is about a learning health system built around activated patient and informed dedicated staff occupying a central position using evidence and science.

The concern that there may be a patient safety fatigue is challenged by the breadth of work represented in the following abstracts. These are activities from across the Kingdom of Saudi Arabia generated over the past years. They speak against "project saturation" and express the energy at the frontline.

This work is a manifestation of a health system creative enough to use concepts and tools that are used regularly with success in other industries. They further indicate that patient safety is maturing, gradually building systems of safety that focus on risk reduction embedding safety in all work processes, pursuing the transformation to a holistic systems approach. It is a slow methodical process responding to a menace that is ever changing and that requires our relentless adaptation to defeat and mitigate harm. The never-ending journey of patient safety continues!



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The abstract review committee would like to acknowledge Dr. Betule Sairafi for her editorial assistance, and Catherine Marinas and Jayson Diño for coordination and administrative support.

The prevalence and cost of inappropriate antimicrobial prescriptions for community-acquired urinary tract infection treatment in the emergency department at KAMC in Saudi Arabia

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Background

Urinary tract infections (UTIs) are a serious health problem affecting millions of people each year. Inappropriate antibiotic (ATB) prescriptions are a threat to patients, leading to bacterial resistance and elevated hospital costs. The aims of this study were (1) to assess ATB patterns in the treatment of UTIs, (2) to determine the prevalence and types of ATB prescribing errors, (3) to identify potential risk factors in an emergency department (ED), and (4) to assess the cost of inappropriate ATB use in the treatment of UTIs.

Methods

This was a retrospective cross-sectional study of physician medication prescription over a period of 3 months in the ED at KAMC, Riyadh.

Results

In the study period, a total of 1449 patients were diagnosed with UTI: pediatric 18.6%, adult 59.2%, elderly 22.22%. Broad-spectrum ATBs were prescribed for 85% of the cases. Three main ATBs were prescribed: cephalosporin (39%), penicillin (26%), and quinolone (22%), with significant age group differences for all three. 4% of patients received three or more ATBs for the treatment of UTI during the study period. The prevalence of ATB prescriptions with at least one or more types of error was 47%, which was significantly higher ($p < 0.001$) among adults (57.7%) compared with elderly (22.2%) and pediatric patients (20.1%). Dose errors were the most prevalent (37%), followed by duration errors (9%) and frequency errors (6%). Initial bivariate analysis of all age groups combined showed that 83% of cephalosporin prescriptions in elderly patients significantly contracted higher errors than those prescribed in adults (60%) and children (66%; $p < 0.001$). Penicillin prescriptions for children resulted in significantly higher errors than when this ATB was prescribed for the other groups. The most common uropathogen isolated from urine cultures was *Escherichia coli*. Multidrug-resistant organisms (MDROs) represented 1.6% of all resistance. The prevalence of MDROs was higher in the elderly (50%) followed by adults (18%) and children (10.34%). Of the agents tested, nitrofurantoin, ciprofloxacin, and augmentin had the lowest rates of resistance in the three age categories. The medical cost ranged from \$93 to \$236 per patient, the direct cost was \$197,149 and the suspected expenditure cost was \$788,596 per year. The median cost of hospital management was \$121.28±29.737 (95% CI \$141.17-145.22) per QALY gained. Comparative analysis showed a difference in direct cost, there was a statistically significant difference between the appropriate costs and inappropriate cost in terms of gender, age, spectrum of antibiotic, category of antibiotic, number of antibiotics, and number of visits ($p < 0.05$).

Conclusion

The prevalence of ATB prescription errors in this ED was similar to that in previous studies, and was particularly common among prescriptions for adults and prescriptions for cephalosporin and narrow-spectrum ATBs. Cost increased as MDROs and broad-spectrum ATB utilization increased. Policy makers should consider both cost and effectiveness of treatment of UTIs in the ED.

The practice of patient advocacy in an Islamic context: a patient safety issue from the perspective of Saudi Arabian ICU nurses

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Background

Patient advocacy for all patients is essential for patient safety, which is crucial in order to provide effective primary care; however, data, information, and knowledge pertaining to Saudi Arabian ICU nurses' perceptions of patient advocacy is currently non-existent. The aim of this study was to explore the effectiveness of Saudi Arabian ICU nurses as patient advocates in Saudi Arabia.

Methods

The study design was based on a constructivist grounded theory approach, utilizing the theoretical sampling process. Data collection included single participant and focus group semi-structured interviews in addition to employing a reflective participant journal.

Results

The perceptions of how Saudi Arabian ICU nurses regarded themselves as patient advocates revealed conflicting data. On the one hand, the study participants believed that only they could be effective as patient advocates for their indigenous country-men and women. On the other hand, they declared that Saudi Arabian ICU nurses were not effectual in, or supported in the advocacy role.

Conclusion

The study revealed data suggesting that in order to provide safe, effective care, primary or extended, the importance of advocacy education for Saudi Arabian nurses is essential. Supporting Saudi Arabian nurses with knowledge concerning patient advocacy will ensure that patient care is safe, appropriate, and performed at the required level.

Comprehensive management of cancer patients with pain: developing the basic principle of cancer pain management among nursing staff in acute medical settings

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Background

Pain is one of the most common symptoms in patients with cancer, occurring in as many as 90% of patients during their illness. Pain is a complex phenomenon, which can be exacerbated by numerous factors. This paper discusses the understanding of cancer pain among nursing staff in acute medical settings and develops the principle of cancer pain management.

Methods

Education activity was held in an acute medical unit where cancer patients are located. The target participants were the nursing staff of the unit. Different teaching strategies were used: case presentation, PowerPoint presentation, and activity-based lessons. The education session was conducted once weekly and included all nursing staff on duty. For this paper, I collected data about the level of cancer pain knowledge by using multiple choice questions before the session and used the same questions after the session to re-evaluate the participants' knowledge.

Results

The participants demonstrated a 95% improvement in cancer pain knowledge, which was sustained at 2 months and maintained at the 6-month follow-up by observing bedside practice and self-reporting. Participants indicated that the knowledge gained positively influenced their clinical practice.

Conclusion

Comprehensive management of cancer patients with pain is achieved among acute medical nursing staff by delivering the education they need to understand cancer pain. Education sessions for the nursing staff improved understanding about cancer pain management. The nurses also reported having made improvements in the care provided to patients and carers after the sessions.

Epidemiological characteristics of oral cavity bleeding in Saudis

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Background

Bleeding disorders, including oral cavity bleeding, are prevalent in the general population. The majority of these disorders manifest as chronic bleeding tendencies or an increase in bleeding time and amount during surgical procedures, or after brushing or trauma. Baseline data about the prevalence of oral cavity bleeding in Saudi Arabia is unavailable. Additionally, many international studies indicated that different age groups experienced changes in frequency and causes of oral cavity bleeding. Therefore, this epidemiological study was conducted to identify the prevalence of bleeding symptoms in the oral cavity among young adult Saudis..

Methods

This questionnaire-based study is cross-sectional and part of an ongoing nationwide project on bleeding disorders. The 740 participants, from the foundation year in universities in Riyadh, were interviewed by qualified healthcare providers and gave detailed answers to clinically relevant questions related to bleeding diathesis. This questionnaire was introduced by the International Society of Thrombosis and Haemostasis (ISTH) and used internationally in frequent epidemiological studies evaluating bleeding disorders. Moreover, the questionnaire was validated locally by experts after translation into the Arabic language.

Results

In this ongoing study, the current results are for 486 male participants and 254 female participants with a male-to-female ratio of 1.9:1. Of the 740 participants, 354 (47.8%) reported a positive history of oral cavity bleeding. In the male group, 206 students (42.4%) experienced oral cavity bleeding compared with 148 students (58.3%) in the female group. However, 293 (82%) of the 354 individuals with positive oral cavity bleeding history reported that the bleeding occurred in concurrence with brushing their teeth. Spontaneous gum bleeding, lips or tongue bleeding after a gentle bite, and bleeding from tooth eruption were reported in 24.9% (88/354), 9.3% (33/354), and 2.0% (7/354) of participants, respectively. Only 26 (7.3%) participants who reported a history of oral cavity bleeding sought medical attention, mainly for consultation. Only one participant required a blood transfusion.

Conclusion

This study revealed a high prevalence of oral cavity bleeding in adolescent and young adult Saudis. In fact, the majority of such bleeding could be prevented and effectively controlled by feasible parameters. One of the major solutions is community awareness with routine patient education concerning periodontal disease. These programs will likely improve the oral health of the general community and control this global problem. Finally, severe cases that require medical interventions need to be investigated thoroughly for underlying bleeding diathesis.

Breaches of infection control measures

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Background

The ultimate goal of any cross transmission investigation in a healthcare setting is to identify probable contributing factors that can lead to a potential outbreak, and to stop or reduce the risk for future occurrences. A probable viral cross transmission infection was detected in the pediatric cardiac intensive care unit (PCICU) area at the MNGHA in the first week of March 2016, caused by poor compliance with infection control measures. Three patients were involved. The index case, who had a community-acquired rhinovirus infection, probably transmitted the virus to two other patients who were located near the index case. The Infection Prevention and Control department conducted an epidemiological investigation.

Methods

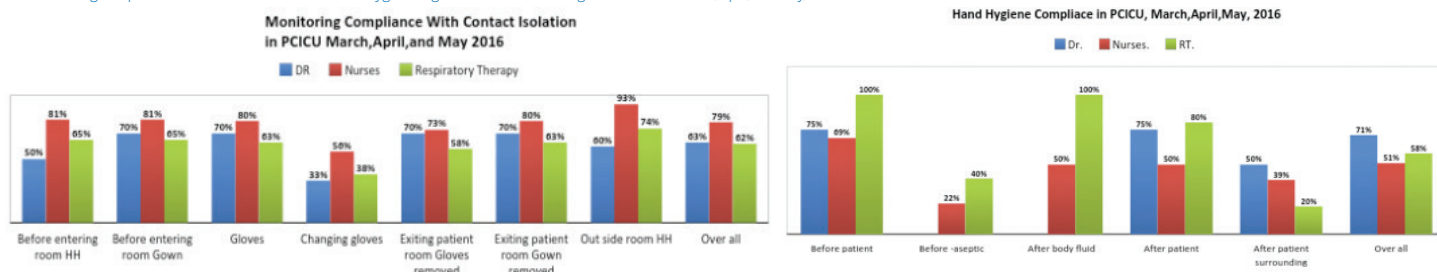
The Infection Control team conducted an epidemiological investigation that assessed the appropriate use of PPE (personal protective equipment), hand hygiene compliance, disinfectant use, and the proper use of the N95 respirator. In addition, the team took samples from six different high-touch areas in the affected rooms in the PCICU for surveillance of environmental cultures.

Results

Samples for culture were obtained from the following sites: trolleys, side rails, monitors, pumps, telephone, and suction regulators. Only two samples yielded positive cultures: those from the trolleys and suction regulators. The two cultures grew the following organisms:

Culture of non-critical item	Growth
Suction regulator	Coagulase-negative <i>Staphylococcus</i>
Trolleys	<i>Klebsiella pneumoniae</i> , <i>Enterobacter asburiae</i> , and coagulase-negative <i>Staphylococci</i>

Monitoring compliance with contact isolation and hand hygiene regulations in PCICU during the months of March, April, and May, 2016



Conclusion

Our observations clearly implicate poor adherence to infection control practices as the main reason for cross transmission and contamination in all the affected areas. Risk assessments were carried out to ensure that best practices are established and followed. All the PCICU staff underwent training and education in the appropriate infection prevention and control practices.

Exploring organizational support for second victims in Maryland hospitals

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Background

Second victims, defined as healthcare providers who are emotionally traumatized after a patient adverse event, may not receive the required emotional support. Although most healthcare organizations have an employee assistance program (EAP), second victims may be reluctant to access this service because of worries about confidentiality. The objective of this study is to describe the extent to which organizational support for second victims is perceived as desirable by patient safety officers in acute care hospitals in Maryland, and to identify

Methods

Semi-structured interviews were conducted with 43 patient safety representatives from 38 acute care hospitals in Maryland (83% response rate) using existing and newly developed questions. Qualitative data were analyzed using the QSR NVivo10 software.

Results

All of the hospitals offered EAP services to their employees, but there were gaps in the services provided related to timeliness, EAP staff's ability to relate to clinical providers, and physical accessibility. Moreover, there are no valid measures in place to assess the effectiveness of EAP services. Participants identified a need for peer support, both for the second victim and for individuals who provide that support. Approximately 18% of Maryland hospitals offer some form of second victim support program, with differences in structure, accessibility, and outcomes.

Conclusion

Patient safety officers thought their organizations should re-evaluate the support currently provided by their EAPs, and consider additional peer support mechanisms. Future research is needed to evaluate the effectiveness of these programs.

Examining influences on speaking up among critical care healthcare providers in the United Arab Emirates

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Background

Although numerous studies have highlighted the importance of reducing medical errors through the use of healthcare provider event reporting systems, where errors are reported, evaluated, and shared among colleagues for the purpose of learning, the concept of speaking up and reporting errors in clinical practice is a continued challenge. The objective of this study is to assess perceived barriers to speaking up and to provide recommendations for reducing barriers to reporting adverse events and near misses.

Methods

A six-item survey was administered to critical care providers in 19 intensive care units in Abu Dhabi as part of an organizational safety and quality improvement effort. Questions elicited perspectives about influences on reporting, perceived barriers, and recommendations for conveying patient safety as an organizational priority. Qualitative thematic analyses were conducted for open-ended questions.

Results

1171 participants were invited to complete the survey and 639 responded (response rate 54.6%). Compared with other stakeholders (e.g., the media, public), a larger proportion of respondents “agreed/strongly agreed” that corporate health system leadership and the health regulatory authority encouraged and supported error reporting (83%; 75%), and had the most influence on their decisions to report (81%; 74%). 29.5% of respondents cited fear of repercussion as a barrier, and 21.3% of respondents indicated no barriers to reporting. Barriers included perceptions of a culture of blame and issues with reporting procedures. Recommendations to establish patient safety as an organizational priority included creating supportive environments to discuss errors, hiring staff to advocate for patient safety, and implementing policies to standardize clinical practices and streamline reporting procedures.

Conclusion

Influences on reporting perceived by providers in the United Arab Emirates were similar to those in the USA and other countries. These findings highlight the roles of corporate leadership and regulators in developing non-punitive environments where reporting is a valuable and safe activity.

Knowledge assessment in Saudi women towards the risk of exposure to radiation during pregnancy

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Background

Women's exposure to radiation during pregnancy can be very harmful to the fetus. However, many women might not know this fact, especially single or newly married women who are about to become mothers.

Methods

We randomly distributed an electronically made questionnaire during the summer of 2016. All data were electronically collected within 2 months of distribution and then analyzed using SPSS (Statistical Package for Social Sciences) version 16.0 software.

Results

In total, 519 questionnaires were distributed across five regions of the Kingdom (west, center, south, east, and north). 510 women (98.3%) responded, of whom 82.2% were between the ages of 18 years and 40 years, and 69.4% were married. 87.8% of the women had had previous knowledge about the health hazards of exposure to radiation during pregnancy. In the group of women who were aware of the risk, it was clear that occupation was a major contributing factor; being a governmental worker improved awareness significantly ($p > 0.05$). There were no significant differences in knowledge between regions, although around 39% of the study population was from the west part of the country. In all, 12.2% (62/510) of the women did not know that exposure to radiation was any risk to the fetus.

Conclusion

Although the majority of the women involved in the study had some awareness of the risk of radiology, a small group were unaware of this risk. The study clearly indicates that there is a need for more awareness campaigns in the community to increase knowledge regarding exposure to radiology and decrease the associated risk and complications.

Barriers to reporting medication errors as perceived by healthcare professionals in a tertiary hospital in Riyadh: a cross-sectional study

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Background

Patient safety continues to be threatened because of medication errors. Reporting of medical errors is a widely recognized process for initiating patient safety improvement, yet we know little about the feasibility of error reporting in KAMC. The aim of the study was to answer the following research questions: (1) what are the healthcare professionals' perspectives on the reasons for medication error occurrence? (2) What are the most common reasons for under-reported medication errors?

Methods

This was a cross-sectional study conducted at KAMC. Participants were 200 healthcare professionals randomly selected out of the pharmacists, nurses, and physicians who work at King Abdulaziz Medical City in Riyadh. We created two questionnaires, each consisting of two main parts. The first part consisted of two demographic questions, and the second part contained 16 questions evaluating the reasons for medication error occurrence and barriers to medication error reporting. A 5-point Likert-type scale was used for quantifying the answers, ranging from 1 to 5, where 1 meant "strongly disagree" and 5 meant "strongly agree". These factors were selected on the basis of literature review and expert opinion.

Results

The overall response rate was 73.5%, of which 62 (42.18%) were pharmacists, 45 (30.61 %) were physicians, and 40 (27.21%) were nurses. Results showed a significant difference in the perception of healthcare professionals regarding the factors affecting medication error. The main differences included interruption while writing the order, clarity of physicians' orders, caring for many patients using the same medications ($p < 0.0001$), lack of information about the medication ($p = 0.0007$), hospital computer system ($p = 0.0004$), similarity of medications ($p = 0.001$), shortage of staff ($p = 0.003$), and knowledge of allergies ($p = 0.018$). There were also significant differences among healthcare professionals' perceptions of the reasons for not reporting medication errors, which were attributed to work environment ($p = 0.0008$), handling errors internally ($p = 0.0005$), the relationship between healthcare professionals ($p = 0.0001$), avoidance of potential publicity ($p = 0.003$), the administration focusing on the person rather than the system as a potential cause of the error ($p = 0.018$), unfamiliarity with the system of medication error reporting ($p = 0.016$), and lack of time ($p = 0.035$).

Conclusion

Further studies are needed to understand the reasons why medication errors are not reported. Individual, organizational, and cultural idiosyncrasies must be considered when formulating organization-specific strategies to address non-reporting or under-reporting of medication errors that will result in improved patient safety.

Significant reduction in ventilator-associated pneumonia (VAP) rate due to improvement in compliance to VAP care bundle

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Background

Ventilator-associated pneumonia (VAP) is the most common intensive care unit (ICU)-acquired infection. The results are unclear as to whether evidenced-based interventions reduce the risk of VAP, so there is controversy surrounding the importance of implementing them as a care bundle. This study aimed to determine if there is a link between implementing such evidence-based care components and the occurrence of VAP in the ICU.

Methods

The study was conducted at the adult medical-surgical ICU at King Abdulaziz Medical City, Jeddah, Saudi Arabia. There were 49,600 ICU patient days including 32,100 ventilator days during the period of 2009 to 2016. Patients admitted from January 2009 to June 2016 to the ICU for 48 hours or more were evaluated. VAP cases were identified according to the Pneumonia Flow Diagram (NHSN 2005). A data entry form was created by the Infection Control department and was filled out for each patient by respiratory therapists during daily assessment, and the forms were interpreted by Infection Control Practitioners to identify cases of VAP. The components for the IHI ventilator bundle were implemented in 2008. The five elements of the bundle were head-of-bed elevation, oral care (chlorhexidine gel), sedation cessation, deep vein thrombosis (DVT) prophylaxis, and peptic ulcer disease (PUD) prophylaxis.

Results

Compliance with head-of-bed elevation of 95-100%; oral care 100%; sedation holds 87-100%; DVT prophylaxis 99-100%, and PUD prophylaxis 99-100% was reported. Overall bundle compliance rates ranging from 84% to 100% were reported from January 2009 to June 2016. The 2.3 cases per 1000 ventilator days was reduced to no cases per 1000 ventilator days ($p < 0.001$) by improving bundle compliance from 84% to 100%.

Conclusion

100% compliance to the VAP prevention bundle was associated with a reduction in VAP incidence to zero. This null rate of VAP was achieved for critical patients in a tertiary-care center after the absolute implementation of the prevention bundle.

Financial sustainability of healthcare systems in Saudi Arabia (risks and self-sufficiency)

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Background

The healthcare system in Saudi Arabia has achieved significant improvements over the past four decades, and health indicators have steadily improved. At present, however, the system is facing some challenges related to population growth and increased expenditure and demand. Accordingly, sustainability of the achievements and future demand is a big concern in the system. Therefore, we will explore financial sustainability in the Saudi healthcare system.

Methods

To analyze the risks that face sustainability of the healthcare system in Saudi Arabia, a framework is based on the models proposed by the Center for Partnership in Development DiS and Africa Bureau's Office of Sustainable Development. The elements of these models cover most of the components of sustainability. All of the applicable indicators to the Saudi system are used, with a special emphasis given to financial sustainability.

Results

A. Resource mobilization:

1. Government health expenditure as a percent of gross domestic product (GDP).
2. Total per capita expenditure on health. The proportion of these two indicators has a fluctuating nature instead of a progressive increase that shows a high risk of sustainability.
3. Sources of financing for health and their relative shares of total expenditure. The reliance on a single resource for funding (oil) rather than diversity of resources put the system in a financial risk.
4. Percent of total health expenditures recovered through various mechanisms of cost sharing.
5. Percent of cost sharing revenues retained at the point of service. While the system is public there is no way of recovery.
6. Percent of facility budget programmed at the facility level. The centralized nature of the allocated budget is another added risk indicator.

B. Efficient allocation and use of resources:

1. Percent of government health budget allocated to primary care.
2. Percent of government health expenditure directed to primary care. Disproportion between spending on primary care and spending on acute care and specialized facilities, with the latter being favored.
3. Personnel expenditure as a percent of total recurrent health expenditures. High personnel expenditures and reliance on foreign manpower both put the system in risk.

Conclusion

Most of the financial indicators fall in the unfavorable aspect of sustainability; accordingly, urge of change is mandatory. The changes related to diversity of the income by which the healthcare system is funded. Other ways of cost recovery should be considered in the system. Major investment should be considered on local manpower.

Lived experiences of theatre nurses with using modified surgical safety checklists: a cross-sectional study

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Background

This study aimed to determine the lived experiences of theatre nurses with use of the modified surgical safety checklist for surgical patients. Eight theatre nurses participated in the study by using the purposive sampling technique. The study used a descriptive qualitative design. A demographic information questionnaire, focus group discussion, and qualitative content analysis were conducted to determine the themes, categories, and meaning units.

Methods

The theme that emerged after coding verbatim replies is optimizing safety, derived from five categories: "safety culture", "effective communication", "efficiency of workflow", "confidence", and "teamwork". Meaning units described each category: first was "safety culture", with the following meaning units: determining the correct patient, procedure, and site, determining baseline data for all instruments, protecting surgical patients from harm, preventing sentinel events, preventing error and complications among surgical patients, informing the surgeon if the patient has intentional packing, promoting the six guidelines of international patient safety goals, acquiring written consent, preventing longer admission, and minimizing the workload. Second was "effective communication", with the following meaning units: establishing good communication within the surgical team and increasing awareness of surgical team members regarding the patient's status by answering questions. Third was "efficiency of workflow", with the following meaning units: verifying what equipment the surgeon will need and halting the start of the procedure if the mentioned equipment was absent, providing guidelines promoting care quality, promoting camaraderie among surgical team members and the patient, and saving time, energy, and effort among surgical team members. Fourth was "confidence" with the following meaning units: following checklists and promoting work commitment. Lastly, "teamwork" with the following meaning units: collaboration of team members regarding concerns affecting the patient and cooperation of the team members.

Results

The theatre nurses have adapted the checklist as part of the standard of care. All members of the surgical team recognize the checklist as an element that enhances the safety of the patient and it has become an integral part of daily routines.

Conclusion

After a minimum use of 2 years of the modified surgical safety checklist, theatre nurses appear to have a positive experience.

Measurement of culture and implementation of TeamSTEPPS Supercharges Quality Improvement Structure in PMBAH Medina, Saudi Arabia

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Background

TeamSTEPPS is an evidenced-based process introduced in some healthcare systems for increasing patient safety. After the introduction of TeamSTEPPS and culture of safety, we believe that the team will improve as evidenced by an improved score on the Team Assessment Questionnaires asked prior to and 6 months after implementation of selected TeamSTEPPS strategies in PMBAH.

Methods

The concept and tools of TeamSTEPPS were introduced to all the multidisciplinary teams. We started handing over in the morning in groups of multidisciplinary team members. Effective communication tools such as ISBAR and I PASS the BATON were introduced together with CUS and the introduction of a checklist to be used for each procedure with the intended result of increasing mutual respect among members and promoting patient safety. The Teamwork Perception Questionnaire (TPQ) consisted of 55 questions with seven constructs regarding the team members' impressions on team behavior in the Labor and Delivery work setting. The constructs were on team foundation, team functioning, team performance, team skills, team leadership, team climate and atmosphere,

Results

Overall, the biggest areas of improvement included the survey domains "frequency of events reported", "feedback and communication about error", and "teamwork within units". The largest decline was seen in "management support for patient safety", "organizational learning-continuous improvement", and "staffing". At 90 days and 6 months, more than 80% reliability was sustained, and we measured the processes and outcome of the implementation of TeamSTEPPS using the TPQ questionnaire and Patient Safety Culture, which showed a 73% improved score ($p>0.05$).

Conclusion

The implementation of TeamSTEPPS processes reduces harm, enhances the efficacy of communication, and helps resolve problems resulting from inappropriate care. Team performance was significantly more visible and leadership style was more congruent to fit the diverse culture of staff.

A multifaceted approach to maintaining potable water quality in a specialized hospital in Saudi Arabia

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King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

Background

Contaminated potable water can impose an infection hazard in any healthcare facility, so maintaining a sustained high-quality potable water source is a core component of safe healthcare provision. The aim of this study is to report the effective use of quality improvement tools to overcome a contamination of the potable water in a specialized oncology and organ transplant hospital.

Methods

The Infection Prevention and Control (IPC) department was challenged with a high colony-forming unit (CFU) count in the hospital's potable water. Therefore, a multidisciplinary team was formed and composed of IPC, the engineering and maintenance department, laboratory services, nursing services, and environmental consultants from another facility. The Plan, Do, Check, Act (PDCA) quality improvement tool was used to resolve this issue. In the planning phase, a "5 Whys" approach was used to draw a root map and sketch out reversing actions. Revision of the current policy and procedure was conducted according to World Health Organization (WHO) standards. Daily chlorine testing, monitoring the cleaning of the water supply system, weekly testing of the level of bacterial and other substances in the water, and temporary restriction of water utilization for patients and workers were instigated in selected areas of the hospital. More chlorine pumps were installed at the source and regular flushing of the supply system was instigated. Finally, an extensively modified action plan was implemented all over the hospital and the effectiveness of these actions was evaluated.

Results

A progressive decline was noticed in the CFU count of the potable water over 2 months until it reached its lowest number (<50 CFU), which was maintained throughout the year.

Conclusion

Use of quality improvement tools is an effective approach to identify the factors contributing to the contamination of potable water, as well as in drawing the roadmap to rectify this issue. This cannot be achieved without the collaboration of a multidisciplinary team.

Reducing the radiation dose in chest CT scans for pulmonary embolism (PE) studies

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Background

It has been noticed that there is an increase in radiation doses (18.6 mGy) among adult patients in the CT department of King Faisal Specialist Hospital and Research Center that is 122% higher than the accepted standard average dose of 8.4 mGy, which may lead to unsafe consequences. A quality improvement project has been developed to reduce radiation dose rates by at least 57% from the baseline of 18.6 mGy to the average acceptable standard absorbed radiation dose of 8.4 mGy in all PE patients undergoing chest CT scans within 3 months.

Methods

A multidisciplinary quality team was formed and several quality assessment tools were used systematically, including the fishbone diagram and Pareto chart, among others, for identifying the possible root causes of PE patients overdosing on radiation during chest CT scans, and then the IHI Model For Improvement (MFI) was used to execute the project ideas. One of the main change ideas was to use the weight-adjusted protocol approach instead of the current practice of fixed 120-kVp protocol. Several PDSA cycles were conducted on a sample of 35 adult patients and data on the different improvement measures were collected, analyzed, and presented on run and control charts.

Results

The radiation dose output rates for a sample of 35 adult patients revealed a significant decline, reaching 5.84 mGy—achieving and exceeding the project's improvement aim with a reduction of 69%. This result is generated automatically through a dose track system inside PACS.

Conclusion

The weight-adjusted kVp protocol approach seems to be more effective than the current fixed 120-kVp protocol for reducing patient radiation doses during chest CT scans. Widening the scope and scale of this project to other radiology sections and modalities is highly recommended.

Hypoglycemia awareness in patients with insulin-treated type 2 diabetes

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Background

Hypoglycemia is an abnormally low blood glucose level associated with antidiabetic treatment. While more common in type 1 diabetes, it is also a danger for patients with type 2 diabetes who are being treated with insulin. It is imperative that patients are educated about the risk and recognition of hypoglycemia. The aim of this study was to evaluate the level of awareness of hypoglycemia in ambulatory high-risk patients with type 2 diabetes.

Methods

This is a pilot hypoglycemia survey for patients with type 2 diabetes attending a nurse-led clinic. The American Diabetes Association Hypoglycemia Questionnaire was used to assess the level of awareness and management of hypoglycemia in these patients.

Results

We surveyed 67 consecutive patients (mean age 61 ± 10 years; 67% male), of whom 97% were on insulin. Mean HbA1c was 8.8 ± 2 with a total daily insulin dose of 82 ± 50 . Only 37% reported full hypoglycemia awareness, with 7.5% having no awareness at all. 9% of the patients had had at least one severe hypoglycemic episode, with 4.5% reporting more than 10 severe episodes. Moderate hypoglycemia was reported by more than 40% of patients. Only 31% of the patients carried a snack to treat a potential hypoglycemic attack. 52% of the patients reported a blood glucose level of less than 3.9 mmol/L at some stage, irregularity of meals being the most common stated cause. Only 3% of the patients on insulin reported having a glucagon kit at home.

Conclusion

Poor hypoglycemia awareness is still prevalent and a feature of brittle diabetes with insulin on board. Patients with diabetes clearly need to be made aware of the risk of hypoglycemia and more frequent monitoring of blood glucose and provision of glucagon kits at home need to be considered.

Insulin safety in clinical practice

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Background

More than three million people in the UK are living with diabetes. With the increasing prevalence of diabetes, it is inevitable that the use of insulin is also increasing. The inappropriate use of insulin has the potential to cause harm, such as severe hypoglycemia, when administering higher than the required dose, or hyperglycemia and diabetic ketoacidosis when skipping or administering an insufficient dose. Insulin is ranked fourth among high-alert drug groups that lead to severe harm or death. This study identifies the sources of error related to insulin use, characterises them in terms of types and magnitude of harm to patients, and develops recommendations to minimize unsafe utilization in clinical practice.

Methods

A retrospective analysis of 194 insulin safety incidents occurred at Cambridge University Hospital over the period April 2014 to December 2015. The data were analyzed using Microsoft Excel and distributed under categories of error types and degree of harm.

Results

Insulin error incidents were highest during administration and prescription (57% and 29%, respectively), while dispensing, monitoring, and other errors accounted for 4%, 2%, and 8%, respectively. The most frequently occurring type of error was omission (25%). In addition, 52% of incidents led to no harm, 39% led to minor harm, and 9% led to moderate harm. No errors led to major harm.

Conclusion

To reduce insulin errors, the study recommends: (a) a yearly mandatory training program for all medical, nursing, paramedic, and pharmacy staff during induction week; (b) to have validation guidelines for administration and prescription of high insulin doses; (d) to emphasise complete medication reconciliation upon admission and on patient discharge; and (e) conducting an audit on the outcomes to determine the level of benefit from these recommendations in reducing insulin incidents.

Medication review: a simple and practical method for reducing potentially inappropriate medications (PIMs) in geriatric patients

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Background

The population of elderly people is increasing worldwide. Polypharmacy, physical limitations, illiteracy, and multiple care providers put the elderly at high risk for medication-related problems (MRPs)—commonly potentially inappropriate medications (PIMs). Although PIMs seem to be a global concern, the best method to deal with them remains to be defined. The main aim of the study was to identify the extent of MRPs and PIMs in elderly patients attending outpatient clinics and the factors associated with them. We also studied the role of the pharmacist in reducing MRPs and PIMs in elderly patients through a review of their medications.

Methods

A cross-sectional study included 365 geriatric patients (aged ≥ 65 years) in an ambulatory care setting. A geriatric pharmacist reviewed all medications. MRPs were identified and PIMs were assessed using 2012 AGS Beers Criteria and 2008 STOPP/START Criteria. Recommended interventions after this review were communicated with the managing team and the percentage of the recommendations accepted or rejected was recorded prospectively.

Results

MRPs were seen in 30% of elderly patients. PIMs represented 50% of MRPs. Almost a third were of high alert medications and medications with low therapeutic index. Polypharmacy and illiteracy was prevalent. The Beers Criteria and STOPP/START Criteria identified different sets of PIMs. After medication review, 25% required interventions and the majority (89%) of interventions were accepted by the managing team.

Conclusion

MRPs are prevalent in elderly outpatients. The STOPP/START and Beers Criteria are complementary. Medication review by a pharmacist is a practical method to reduce MRPs and PIMs and should be routinely applied for the care of all geriatric patients.

Improving utilization of off-label prescriptions in palliative care

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Background

The off-label use of drugs in palliative care is necessary. These off-label uses are, however, fully evidence-based and therefore considered safe to use. Use of unlicensed drugs is rare.

Methods

In a pilot study, we randomly reviewed 20 patients' charts for prescriptions for the five most common symptoms: pain, nausea and vomiting, dyspnea, excessive secretions, agitation, and anxiety.

Results

A significant number of prescriptions were off label: 36 (51.4%) of 70. Use was off label per indication (66%), route of administration (17%), and dose (14%). The five most common drugs used off label were metoclopramide, glycopyrronium, dexamethasone, morphine sulfate, and midazolam. Some medications were used for more than one indication (e.g., haloperidol for agitation as well as nausea and vomiting, morphine for pain and dyspnea) where one indication was approved and the other was off label. No serious side effects have been reported.

Conclusion

In this initial sample, the percentage of off-label prescriptions is high at 51%. This might reflect the sample size. We expect more use of the subcutaneous route, especially towards the end of life, where evidence permits. Off-label prescription is common, necessary, and safe.

Reducing abandoned calls in Saudi Red Crescent Authority's Riyadh call center

Thamer Bakhamis, Khaled Al Surimi

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Background

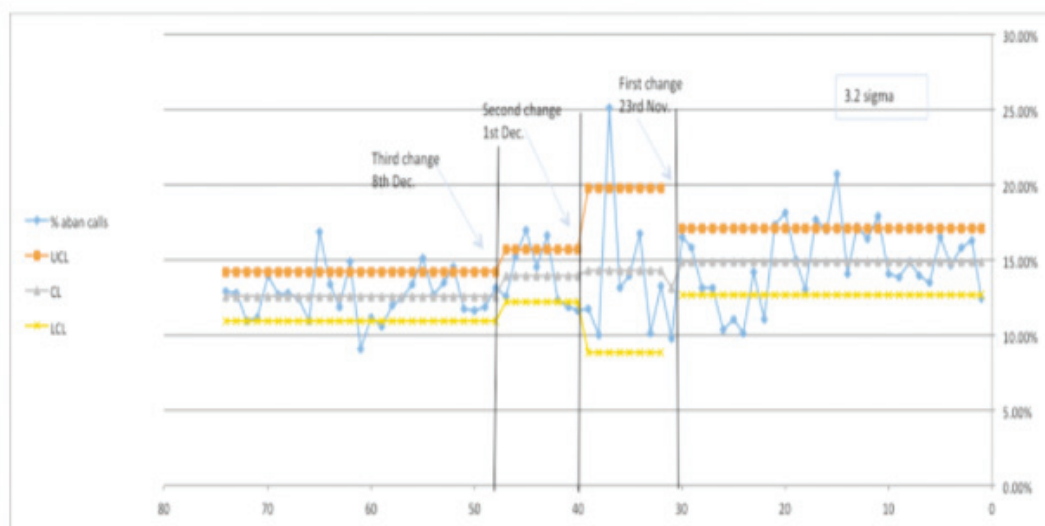
The Riyadh call center of the Saudi Red Crescent Authority (SRCA) is one of the busiest call centers in the Kingdom. We studied data from September 2016 and found that 15% of the total calls were abandoned. This percentage is very high compared with other emergency medical services call centers in the world. This is unsafe for patients because their medical condition could be exacerbated if the call is ended before they are assessed.

Methods

The fishbone diagram and 5 Why quality assessment tools were used by the team to list the possible causes. We planned our change ideas based on the causes and the available resources, including sending emails to all call takers reflecting their performance in September 2016 to increase their awareness about the number of abandoned calls, generating a handover guideline among call takers and adhering to it, and rearranging break-time policy and following it. Three PDSA cycles were done for this change so far. Our project design was to compare the results before and after the change.

Results

The percentage of abandoned calls was reduced after the third PDSA cycle, reaching 12.6%, and was sustained for almost 1 month, as shown in the control chart below.



Conclusion

We conclude that arranging a break-time policy and following it had a strong impact on reducing the percentage of abandoned calls. We recommend scaling up the change in more call centers and testing its effect.

Improving referral to the psychological support unit at Saudi Red Crescent Authority in the Riyadh Region

Ahmad Al Zahrani, Khaled Al Surimi

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Background

Research shows that emergency medical services (EMS) providers are encountering stress in various EMS settings and about 86% of them suffer from critical stress. Saudi Red Crescent Authority (SRCA) data show that only a small number of referred cases sought psychological advice and management. Thus, this improvement project aims to promote the importance of seeking psychological support among SRCA employees and increase the number of cases referred to the psychological support unit.

Methods

Quality assessment tools and methods, including the fishbone diagram and process flowchart, among others, have been applied to identify the possible causes of the problem. Lack of awareness about psychological support, lack of privacy and confidentiality, and most importantly the long referral process were the most expected reasons behind not seeking psychological support among SRCA employees. We decided to test some change ideas: conducting an awareness campaign among SRCA employees, establishing a private and secure way for psychological consultation (i.e., electronic channels), in addition to re-engineering the referral process. These interventions have been tested for three consecutive weeks to streamline the process by removing some unnecessary steps and linking the referral case directly with the psychological support unit staff. Several PDSA cycles have been conducted to test these change ideas and data have been collected, analyzed, and presented on a run chart.

Results

As shown in the run chart, the change ideas seem promising and lead to a steady increase in the number of referred cases to the psychological support unit compared with the baseline data.



Conclusion

The tested change ideas, specifically re-engineering the referral process, could be used as a future strategy to promote seeking psychological support among SRCA employees. However, further PDSA cycles are still needed before moving to the implementation stage.

Reducing the rate of blood culture contamination at the King Khalid University Teaching Hospital, Riyadh, Saudi Arabia

Salma Al Shamrani, Khaled Al Surimi

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Background

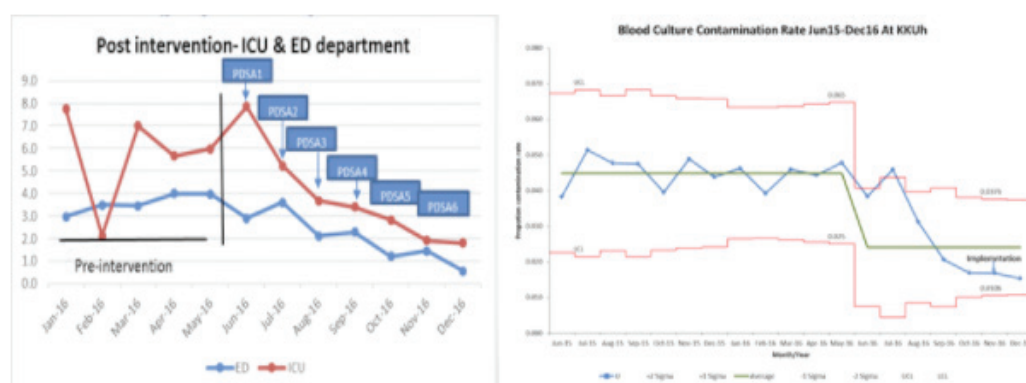
Blood culture is an important laboratory test to determine the presence of bacteria and fungi in patients' blood. Frequent blood culture contamination leads to false-positive blood cultures, unnecessary treatment, and a waste of laboratory resources. The College of American Pathologists (CAP) states that blood culture contamination rates should be within an average of 2-3%. Based on 2015 and May 2016 data at King Khalid University Hospital, we had experienced a consistent increase in blood culture contamination rates with an average of 4.6%. Both the emergency department (ED) and intensive care unit (ICU) had the highest number of contaminated samples (5.7% and 4.6%, respectively).

Methods

We initiated a multidisciplinary team to decrease blood culture contamination rates to the level of CAP requirements or less (3% or less) over a 6-month period. We used the IHI Model for Improvement (MFI) as a framework to conduct the project. We tested several change ideas including updating the current blood culture policy aligned with translating its content into reminder posters, auditing compliance checklists, and regular feedback sent by laboratory staff to the concerned departments. Several PDSA cycles have been conducted to test the change ideas and proposed solutions. All relevant data were extracted from the laboratory information system and analyzed and presented on run and control charts.

Results

A significant reduction in the contamination rate in the ICU was found (1.8% at 6 months compared with 4.6% at baseline), along with a similarly significant reduction in the contamination rate in the ED (2.0% at 6 months compared with 5.7% at baseline), both of which met and exceeded the CAP benchmark of 2-3%.



Conclusion

Standardizing the work process and providing just-in-time training as well as regular auditing performance and feedback are effective, evidence-based strategies for reducing blood culture contamination in a tertiary teaching hospital.

Introducing discharge lounge service in KASCH and its impact on patient flow

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Background

The long waiting time of patients with written discharge orders has been clearly observed. This problem was identified as an obstacle that delayed patient flow in pediatric inpatient units.

Methods

Multiple interventions were done for better bed utilization and optimizing safe patient flow after discharge orders were written.

1. Introducing a pediatric discharge lounge in KASCH, ground floor, wing 1.
2. Collaborating with social services to design a child friendly unit for our patients.
3. Pediatric discharge lounge DPP created to provide clear guidelines related to safe and efficient use of discharge lounge service.
4. Spreading awareness to primary nurses and charge nurses about implementation of discharge lounge DPP.
5. Monitoring the common reasons that cause delay in the discharge process and coordinate with departments to resolve them and improve the provided service.
6. Encourage discharge lounge utilization by inpatient units regardless of bed requirements.

Results

Patients moved immediately to the discharge lounge after the discharge order. This enhanced patient flow from different units to inpatient units and avoided unnecessary delays in the discharge process. 3072 patients used the pediatric discharge lounge in 2016 with an average length of stay of 80 minutes. The total hours saved is 4218.32. The estimated saved cost is 850,000 SAR. The proportion of patients discharged home was 99.60%—a few cases flowed back to inpatient services. Early transfer of discharged patients allowed better bed utilization by other services (emergency room, post-anesthesia care unit, elective admissions, high dependency unit, and pediatric intensive care unit).

Conclusion

Introducing the discharge lounge service for pediatrics in KASCH enhanced patient flow in a safe manner. The project may move further by addressing other reasons that delay the discharge process.

Systemic antibiotic prescription patterns in National Guard outpatient clinics, Jeddah, Saudi Arabia

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Background

Antibiotics are one of the most prescribed medications worldwide. The misuse of antibiotics is an international health issue that has led to the emergence of antibiotic resistance. The inappropriate prescription of antibiotics plays a major role in the development of microbial resistance. The aim of this study is to evaluate the pattern and extent of antibiotic prescription in outpatient clinics at King Abdulaziz Medical City (KAMC), National Guard Hospital–Jeddah, Saudi Arabia.

Methods

A total of 5472 prescriptions were reviewed from 28 January to 29 February 2016. Prescriptions containing systemic antibiotics were analyzed for the main elements of medication order. The World Health Organization (WHO) core drug use indicators were measured.

Results

The percentage of prescriptions that contained systemic antibiotics was 8.2% (n=449) of all prescriptions reviewed during the study period. Only 8% (n=36) of prescriptions contained more than one antibiotic agent, while the majority contained a single antibiotic. Family medicine clinics constituted 37% (n=168) of all prescribed antibiotics. The diagnosis was missing in 8.5% (n=38) of prescriptions. Allergy was not documented in 6.2% (n=28) of prescriptions. Upper respiratory tract disease was the most common diagnosis in 35.6% (n=160) of patients who received antibiotics. The most frequently prescribed antibiotics were augmentin and azithromycin in 21.1% (n=95) and 20.7% (n=93) of patients, respectively.

Conclusion

The percentage of systemic antibiotic prescriptions in KAMC outpatient clinics was acceptable according to the WHO indicators. However, missing information in some of the prescription forms necessitates further monitoring and education on the rationale of antibiotic prescription.

Implementing the Lean principle to efficiently manage adverse event closure

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Background

After introducing the safety reporting system (SRS), our oncology department was still lacking the standardized systematic review process. Many cases were not closed, findings were not documented properly, members' roles were not clear, no regular follow-up existed, and members were neither fully exposed to the quality methodology/tools nor familiar with their applicability. Therefore, we implemented the Lean project to improve the process and efficiency of adverse event closure.

Methods

The 6S Lean principle (set, sort, shine, standardize, sustain, and safety), the plan-do-study-act (PDSA), and the eight types of waste (time, inventory, motion, waiting, over-processing, over-production, defect, and staff underutilization - TIM WOODS) theory were used during the observation/participation of the (SRS) Committee's meetings. The adverse event process was mapped, and fishbone, SRS tracking log, and departmental policy and procedure (DPP) were developed.

Results

The 6S Lean and PDSA were introduced in late April/early May. The year 2016 was split into three phases; phase I (Jan-Apr), phase II (May-Aug), and phase III (Sep-Dec). The average closure days were compared for all reported incidents: 104 days, 69 days, and 37 days, respectively, and a 64% reduction was reported when comparing phase I with phase III. For medication incidents, the average closure days were 61, 42, and 25 days, respectively, and a 59% reduction was reported when comparing phase I with phase III.

Conclusion

Streamlining the process of managing adverse events was very crucial for timely closure. As improvement methodology, Lean was very effective for identifying the types of waste in the process activities. Having Lean principles embedded into our culture would greatly impact and improve organization performance.

LEAN thinking: creating an efficient performance appraisal (PA) process through reducing editor's time and errors

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Background

Antibiotics are one of the most prescribed medications worldwide. The misuse of antibiotics is an international health issue that has led to the emergence of antibiotic resistance. The inappropriate prescription of antibiotics plays a major role in the development of microbial resistance. The aim of this study is to evaluate the pattern and extent of antibiotic prescription in outpatient clinics at King Abdulaziz Medical City (KAMC), National Guard Hospital–Jeddah, Saudi Arabia.

Methods

The 6S Lean Principle (set, sort, shine, standardize, sustain, and safety), time, inventory, motion, and over-processing were identified as types of waste "Muda" in the PA forms. Data collection was designed where the time comparisons before and after Lean implementation were recorded in minutes, errors were counted for each phase, and staff satisfaction was evaluated at the end of the session on a Likert scale.

Results

Twelve administrative assistants participated in the project. The Lean project saved 53% of the editors' time/cost spent when feeding the data; the total minutes spent by all staff pre- and post-Lean was approximately 275 and 146 minutes, respectively. Errors were reduced from 189 to 14, a 93% reduction. All participants expressed high satisfaction with the Lean document, scoring 5 out of 5 on a Likert scale. At the paid rate of 16.66 SR per hour, Lean documents will save 1177.2 SR of cost for 133 employees working for the department, and the minimum projected total saving system-wide is 177,022 SR annually.

Conclusion

Use of the Lean thinking principle in the design phase of such documents is highly recommended, especially within organizations with large numbers of employees. Having Lean principles embedded in the culture of any organization would help to improve operations on a small scale, with a big impact in the long run.

Antibiotic use and awareness among visitors attending National Guard primary healthcare centers – Jeddah, Saudi Arabia

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Background

Misuse of antimicrobial agents has led to the emergence of global antibiotic resistance. The three main contributors to antibiotic resistance are physicians, pharmacists, and patients. Patients in Saudi Arabia have easy access to antibiotics, which further contributes to the development of resistance. Our aim in this study is to address patients' usage patterns and knowledge of antibiotics in primary healthcare centers, Ministry of National Guard, Jeddah, Saudi Arabia.

Methods

A cross-sectional study was conducted from February to June 2016 at National Guard primary healthcare centers in Jeddah. Self-administered Arabic/English questionnaires were distributed with the convenient sampling technique.

Results

A total of 405 questionnaires were collected from four primary healthcare centers. There were 56.3% female respondents (n=228) and the mean age was 31.7 years (SD 11.7). 70% of participants reported antibiotic use in the past year. More than half (55.8%) would use antibiotics when they had a common cold and 40.1% would recommend antibiotic medication based on their experience. Only 47.9% complete the full antibiotic course. Overall compliance was 65.2%. Among antibiotic-compliant patients, 76.5% (n=186) had physician antibiotic prescriptions compared with 23.5% who received non-physician prescriptions (pharmacist, others' recommendations, own decision). Half the participants (52.9%) had never heard of the term antibiotic resistance.

Conclusion

Relatively good compliance was associated with physician antibiotic prescriptions. More than half the population showed inappropriate antibiotic use. Both compliant and inappropriate use can impact the prevalence of antibiotic resistance in the region, necessitating further control and education about antibiotic use.

LEAN thinking: hospital-wide printing optimization project

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Background

Within the context of budget cuts and rationalizing the use of the available resources by Saudi government policy, King Faisal Specialist Hospital and Research Center (KFSHRC) has decreased the supplies budget by 40% for the year 2016. Printing supplies is among the biggest categories on the hospital supplies budget. Data from 2015 shows that the printing cost for that year was 3,723,352 SR. Thus, we developed a hospital-wide Lean project aiming to decrease the cost of printing by using the current available resources efficiently.

Methods

A Performance Improvement (PI) team was formed from different departments including the quality management division and representatives from sections in hospital information system affairs to carry over the tasks in this project. Several quality tools were used to assess and analyze the problem and its root causes. The analysis showed that the few vital causes for high printing costs are inadequate education about printing value, printing unnecessary documents, and the high number of toners purchased. Thus, the PI team chose the three most effective change ideas to be tested using the PDSA cycle approaches. These ideas are: (1) initiating printing restrictions by requiring a user ID, (2) conducting an electronic campaign to increase employee awareness, and (3) replacing the existing printing solution for efficient printing and toner saving. The PDSA cycle was tested in the four departments with the highest use of printing services.

Results

As shown in the control chart, over the 3 months in 2016, the project team was able to save 9% (335,102 SR) of the printing cost. These promising results encouraged the PI team to plan for another PDSA cycle on a bigger scale before moving to make the policy decision to implement and scale-up the project improvement ideas across the hospital.



Conclusion

The Lean approach could be used to improve the efficiency of hospital operations and reallocating these saved resources to improve the quality and safety of hospital clinical patient care.

Health leaders' role in National Transformation Program to improve patient safety culture

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Background

In light of the Saudi government's attention to the welfare of its citizens and development of the nation's resources, and its desire to build a promising future for the coming generations, "Saudi Arabia's Vision 2030" was launched, based on charting features to maximize the strengths of the Kingdom. As stated by the Custodian of the Two Holy Mosques King Salman bin Abdulaziz, his goal is for "Saudi Arabia to be a successful model and a pioneer in the world at all levels". The future vision of Saudi Arabia relies on three main pillars: a dynamic society, economy, and ambitious nation.

Methods

As a first step towards realizing the vision of Saudi Arabia a number of programs have been initiated in various government sectors, including the National Transformation Program 2020. It aims to stage an initial 24-hour governmental organization of the economic and development bodies to implement different initiatives and to achieve strategic objectives through the next five years. Among the government agencies that participated in the National Transformation Program is the Ministry of Health.

Results

The Ministry of Health has identified several strategies in the National Transformation Program that will improve the quality of preventive and therapeutic services. One of these strategic objectives is the fifteenth objective, "improving patient safety culture", which is one of the most important objectives, especially in light of increasing reported cases of medical errors both on global and local levels.

Conclusion

There is no doubt that adoption of patient safety principles in any healthcare setting depends primarily on leadership commitment and support. There are certain tactics that can be implemented by health leaders to create and strengthen patient safety culture.

Safety and efficacy of nurse-led prosthetic valve anticoagulation clinics

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Background

Valvular heart disease is a major and serious healthcare issue. There is increasing evidence that nurse-led anticoagulation clinics may improve patient management, safety, and care. Anticoagulant nurses were found to be safe and effective in managing outpatients on anticoagulation.

Methods

This is a retrospective comparison study that included the first 94 patients enrolled in the Nurse-Led Prosthetic Valve Anticoagulation Clinic (PVATC) in King Abdulaziz Cardiac Center between April and June 2013 who received warfarin from general cardiology clinics for 1 year prior to enrolment in PVATC and 1 year after. The time in therapeutic range (TTR) of the international normalized ratio (INR) was calculated and compared between pre- and post-PVATC enrolment. Other data including demographics and comorbidities were collected and analyzed.

Results

The mean age of patients was 53 ± 12.5 years and 56% were male. Atrial fibrillation was found in 37%, diabetes mellitus in 28%, and hypertension in 34%. Mean TTR was 72% pre-enrolment in PVATC compared with 78.9% after enrolment ($p < 0.006$). Median TTR was 75% pre-enrolment, and 81.5% after attending the PVATC ($p < 0.0001$). 56% of patients pre-enrolment had TTR values above the 70% threshold, compared with 75% after enrolment.

Conclusion

Nurse-Led PVATC has had a significant impact on the care and safety provided to patients receiving anticoagulation treatment.

Assessing medication errors and developing strategies to ensure safe practices with the use of oral chemotherapy in patients with chronic myeloid leukemia (CML) at KAMC-WR

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King Abdulaziz Medical City, Ministry of National Guard Health Affairs, Jeddah, Saudi Arabia

Background

Medication errors are relatively common with intravenous chemotherapy regimens. However, oral chemotherapy is becoming more commonly prescribed and requires additional personnel training in safe dispensing and adequate patient education. The goal of this study is to assess the prevalence of oral chemotherapy medication errors and to develop strategies to ensure safe practices in the ordering and dispensing of oral chemotherapy drugs used in the treatment of chronic myeloid leukemia (CML).

Methods

This retrospective study will evaluate all patients with CML aged 14 years or older receiving FDA-approved oral chemotherapy drugs. Patients were identified through the Information System Development (ISD) department at our institution. Through medical record database and patient chart evaluation, baseline demographics in addition to adverse drug events secondary to CML treatment (tyrosine kinase inhibitors [TKI]) will be recorded. In order to assess the medication errors associated with patient adherence and drug-drug interactions, patients/patient caregivers will be interviewed once during the study period.

Results

These preliminary results are for 60 patients (mean age 54 years). 57% of patients had previously reported adverse drug events secondary to TKI therapy. 40% of the detected medication errors were due to prescribing and monitoring errors. Using a validated "patient adherence formula", 62% of patients were found to be compliant with TKI therapy during the interview. The most common trigger for medication errors is physician order problem; 91% of physician order problems were due to drug-drug interactions; 48.4% of drug interactions were found to be under category X (according to US FDA). 42% of medications errors were classified as category C according to the NCC MERP Index.

Conclusion

Research is ongoing until we complete the desired sample size. A limitation of this study is the inability to assess adherence in all patients. Some patients were lost to follow-up and as such, could not be interviewed to determine adherence.

Improving turnaround time (TAT) at the immunology laboratory of KFSHRC

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King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

Background

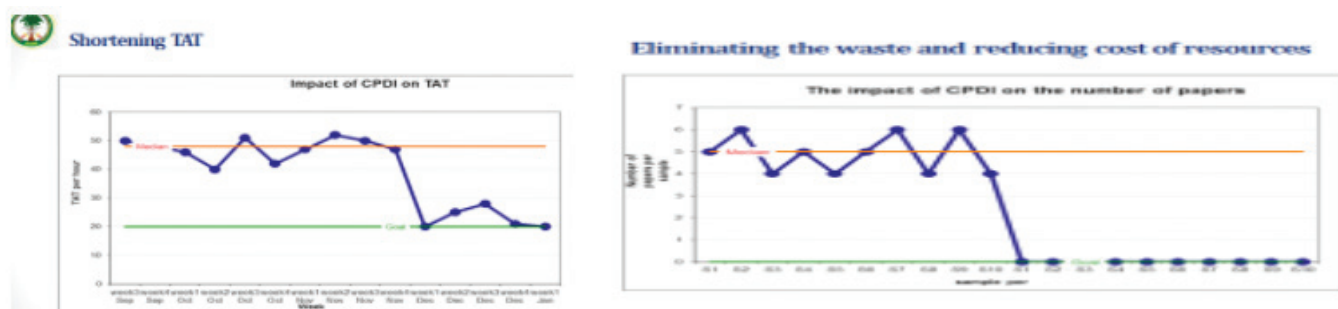
The immunology laboratory at King Faisal Specialist Hospital and Research Center performed on average 10,000 tests for HLA typing and anti-HLA antibody identification. Since 2007, our laboratory's workflow has employed a lengthy process in terms of result entry; an average of 9 minutes per sample. In addition to the manual methods by which these tests are performed, there are several manual steps to result entry that include report printing, filing, and record retrieving, which lead to improper utilization of space and employee time. This current practice causes a delay in diagnosis and treatment planning.

Methods

The objective of the project was to reduce the turnaround time (TAT) in the immunology laboratory by 50%. The project was started using Lean methodology coupled with PDSA cycles. We mapped the existing process and conducted value stream mapping and identified non-value added steps in the process. Based on this, we decided on an intervention of implementing CPDI to reduce the result entry time to verification, which leads to improvement of the overall TAT. We tested the following using PDSA cycles: measuring average time for results entry to verification, number of samples per week, number of pages reduced, and finally measured the overall TAT to see the impact.

Results

Based on the data collected and analyzed after the intervention, TAT (as outcome measure) was reduced by 50% compared with baseline. The number of papers used reached zero and the number of entry times for results verification (as process measures) reduced dramatically, showing that the tested change ideas led to improvement.



Conclusion

Lean thinking philosophy is a powerful method to be used in the laboratory for improving work process efficiency through the removal of the non-value added steps, eliminating waste, reducing cost, shortening TAT, and maximizing throughput. One of the key factors and strengths that would maintain the success of its implementation is working efficiently as a team.

Improving cancer patient satisfaction by decreasing the prolonged waiting time for chemotherapy administration

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Background

On the basis of our patient satisfaction survey, which revealed concerns about waiting time, we initiated a quality improvement project. The median time until patients started their session was 180 minutes. Our aim was to reduce the waiting time for chemotherapy administration to less than 50% over a 6-month time period and to sustain it at that level.

Methods

We used a FOCUS-PDCA multidisciplinary approach and, based on the fishbone diagram, we identified the root causes and contributing factors of the waiting time problem. We implemented three improvement cycles. First, we redesigned the nursing triage, treatment processes, and nursing awareness programs. Second, we improved nursing documentation to ensure the accurate tracking of patients who declined their appointment or overbooked patients. Third, the pharmacy received electronic forms and prepared the chemotherapy once the order was submitted to the system. We implemented a department-wide standard of care to provide an early assessment of the patient once arrived and we activated a specific chemotherapy clinic for patient booking and laboratory investigations, which is supervised by a trained qualified oncologist.

Results

Median time to chemotherapy administration was reduced to 30% in the first 3 months and then to 50% in the following 6 months. We are checking every 2 weeks for sustained action and we have generated electronic indicators from the time patients check in until they receive treatment, guided by pharmacy electronic confirmation. The action plan was initiated in February 2016, and the decline in waiting time after 2 weeks, 1 month, and 2 months was 0%, 5%, and 20%, respectively. In October 2016 the median reduction was 50% and it has continued to improve and we are monitoring it. There have been no complaints during the past 6 months.

Conclusion

A strong and inverse relationship between patient satisfaction and waiting times in cancer care settings has been demonstrated. A significant reduction was achieved by our quality improvement project in response to patients' requests.

Bridging the gap between theory and practice; the active role of inpatient pharmacists in therapeutic drug monitoring

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Background

Therapeutic drug monitoring (TDM) is a fundamental responsibility of all pharmacists to provide optimized therapeutic outcomes for patients. It leads to a reduced incidence of adverse effects and a reduction in mortality. However, many hospitals face barriers to implementation of TDM, including pharmacists spending most of their time on dispensing and dealing with inventory issues, and a lack of pharmacokinetic expertise. Therefore, this project aims to evaluate the impact of a pharmacist-led TDM service to optimize patient care at a tertiary-care hospital.

Methods

The design is a pre-post study. The pre-phase consists of a report of all patients that have been given vancomycin, gentamicin, and amikacin for 3 months. Orders will be evaluated for correct dosage and laboratory drug level requests. A team of pharmacists will then be trained by educational methods including interactive lectures, flowcharts, and checklists. The post-phase will consist of pharmacists reviewing a daily report of the three antibiotics on a 24-hour, 7-day basis and provide recommendations regarding the following parameters: initial dose, dose adjustment, and laboratory drug level requests. The primary outcome is the proportion of correct initial doses of prescribing orders for vancomycin, gentamicin, and amikacin as per hospital guidelines. Secondary outcomes include proportions of correct dose adjustment orders and correct orders for drug sampling time. It was determined that 75 patients per treatment group would yield 90% power to detect a difference of 25% between different phases for the primary outcome.

Results

Preliminary results of 40 patients in phase 1 reveal that 45% of initial dose orders, 43% of dosage adjustments, and 48% of drug levels ordered of vancomycin were incorrect.

Conclusion

Phase 2 will provide answers on the impact of pharmacist interventions on TDM of vancomycin and aminoglycosides. The study is ongoing until the desired sample size is reached.

Hospital length of stay and associated factors among patients with confirmed influenza admitted to King Abdulaziz Medical City, Western Saudi Arabia

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Background

Influenza can cause mild to severe illness and serious complications can result in hospitalization or death. Clinical presentation and management of influenza cases in Saudi Arabia have been tackled, especially during the 2009 H1N1 pandemic; however, available data on influenza-related hospital stay in the country is limited. This study aims to assess factors that determine the length of stay among hospitalized cases of confirmed influenza in King Abdulaziz Medical City, Western Saudi Arabia.

Methods

A retrospective review of laboratory-confirmed influenza cases admitted to King Abdulaziz Medical City during the period January-December 2016 was conducted. Identified variables included age, gender, influenza subtypes, and associated comorbidities.

Results

Among the 568 laboratory-confirmed influenza cases during the study period, 157 (31.4%) patients were admitted. Around half (52.2%) of the admitted patients were female, 20.4% were 5 years old or younger, 51.6% were 5-65 years old, and 28.0% were older than 65 years. Healthcare workers represented 3.2% of the admitted patients. Influenza A-non H1N1 represented 65.6% of the admitted cases followed by influenza B (36.3%) and influenza A-H1N1 (10.8%). Some patients had more than one episode of influenza. Most patients (65.0%) were admitted for more than 2 days (41.4% for 2-5 days and 23.6% for more than 5 days). Length of stay was significantly longer among elderly patients (>65 years old) and patients with diabetes mellitus and cardiac, chronic respiratory, and immune deficiency diseases. No significant statistical association was reported according to type of influenza.

Conclusion

A significant number of patients were admitted for influenza for a duration of more than 2 days. Length of stay was associated with chronic morbidities and old age. Enhancement of immunization programs, especially for high-risk patients, is essential for reducing the burden of influenza on patients and the healthcare system.

Role of barcode technology and smart infusion pumps to reduce the potential risk of erroneous blood transfusion

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Background

Incorrect blood transfusion to a patient leads to serious complications and possibly death. In line with the National Guard Health Affairs strategy “right care right now with zero defects”, we aim to have a zero incidence of incorrect blood transfusions by applying a closed-loop process for blood transfusion procedures.

Methods

A multidisciplinary team has been formulated to address the issue; sampling and blood administration have been recognized as the two processes that have potential for improvement. Closed-loop workflow will be introduced by use of barcode technology associated with smart infusion pumps in the trauma intensive care unit as a pilot unit. The proposed process improvement will use PDCA cycle method.

Results

In addition to the current potential risk of patient identification mismatch, the average duration for the manual verification process is around 5 minutes. By applying the proposed workflow, data will be collected and plotted in a running chart to create a family of measures that will show the change effects:

- Target outcome measure: 100% accuracy of patient identification in sampling and patient verification before blood administration.
- Target process measure: more than 70% reduction of consumed time for patient identification in sampling and patient verification before blood administration.
- Target balancing measure: increase staff satisfaction by reducing unnecessary steps during the blood transfusion procedure.

Conclusion

The quality improvement by use of barcode technology and smart infusion pumps to achieve accurate patient identification will be one of the key outcomes. This sustainable strategy is to be applied throughout the organization to standardize the new workflow that will significantly reduce the potential risk of incorrect blood transfusions.

Ventilator-associated pneumonia (VAP) prevention bundle implementation and staff education to reduce VAP incidence in the pediatric intensive care unit

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Background

Ventilator-associated pneumonia (VAP) is the second most common hospital-associated infection in the pediatric intensive care unit, which leads to high morbidity and mortality. The incidence of VAP in our institute was reported to be 3.1 per 1000 ventilator days in 2015, which necessitates an interventional strategy to decrease it.

Methods

We did a literature review, collected evidence-based strategies in one VAP prevention bundle to implement in our institute, along with intensive staff education using video material, a VAP awareness day, and presentations. We aimed to evaluate: (1) the compliance rate to the bundle by analyzing data collected from daily auditing; (2) staff knowledge by completing survey questions before and after education; and (3) VAP incidence in 2016.

Results

Data analysis showed an increase in compliance to the VAP prevention bundle from 73% in April 2016 to 96% in December 2016. During 2016 there was only one case of VAP (on 19 May). The VAP rate per 1000 ventilator days decreased from 3.1 in 2015 to 0.59 in 2016. Survey results before and after education showed increasing staff knowledge about the bundle.

Conclusion

Compliance to the implemented VAP prevention bundle and staff education can decrease VAP incidence in the pediatric intensive care unit.

Study of predictors of optimal anticoagulation in patients attending a prosthetic valve anticoagulation clinic for safe administration of warfarin

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Background

The need for lifelong anticoagulation in patients with mechanical heart valve prosthesis is well established. Warfarin is the only guideline-recommended drug, but its narrow therapeutic index, drug interactions, and genetics make it a high-risk drug for adverse effects and hospitalization. The time spent in therapeutic range (TTR) is a valuable method for assessing anticoagulation control with warfarin. The aim of this study was to determine the predictors of TTR in patients attending a heart valve anticoagulation clinic to prevent warfarin-related major adverse effects such as bleeding, valve thrombosis, and stroke.

Methods

This was a retrospective study in patients attending a prosthetic valve anticoagulation clinic. Data analyzed included patient demographics, comorbidities, and TTR by the Rosendaal method. The relationship between continuous variables was analyzed using correlation (Spearman's rho) and linear regression. Data were analyzed using JMP (SAS for Windows), with $p < 0.05$ considered significant.

Results

The total number of patients was 270 with a mean age of 54.1 ± 13.3 years; 45.6% were female. The TTR was significantly lower and the number of INR tests performed was higher in patients with the target INR of 2.5-3.5. Target INR of 2-3, single valve, male gender, and age older than 50 years predicted a high TTR, whereas female gender, anemia, and atrial fibrillation were associated with a TTR of less than 75%. In a linear regression model, with TTR more than 75% as the dependent variable and adjusting for potential confounders, the only independent predictor of TTR was the INR target ($p < 0.01$).

Conclusion

Patients with a high INR target are older females with mitral or multiple prosthetic valves, with chronic atrial fibrillation, and are more likely to have anemia. Their management is demanding as shown by a significantly higher number of INR tests per patient. This study can help us target high-risk patients and aid in developing a predictive model for better anticoagulation in the Arab population.

Multifunctional evaluation in elderly patients hospitalized for heart disease

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Background

Frail patients with cardiovascular diseases have higher rates of adverse events and complications, suggesting the need for more accurate functional stratification and careful evaluation of the risk/benefit ratio of invasive procedures. As part of our ongoing project aiming to evaluate the prognostic impact of the Short Physical Performance Battery (SPPB) and handgrip test on the incidence of death and hospitalization for all causes in elderly patients hospitalized for heart disease, we will present baseline characteristics for the first enrolled group and frailty differences between genders.

Methods

This is a prospective observational study targeting 324 patients aged 65 years or older. Eligible patients fall into at least one of the following groups: (1) patients hospitalized for acute coronary syndrome, arrhythmias, or heart failure; (2) patients admitted for transcatheter aortic valve implantation; (3) patients admitted for cardiac surgery. To date, 92 patients have been evaluated for frailty by use of the handgrip test (using a dynamometer to measure the force of muscular contraction), SPPB (to evaluate the functionality of the lower limbs), and short portable mental questionnaire SPMQ (10-item cognitive screening instrument reflects severe intellectual impairment). Descriptive analysis was used representing continuous and categorical data as mean \pm SD and percentages, as appropriate.

Results

Between December 2015 and May 2016, we enrolled 92 patients. Mean age was 72.2 \pm 6.1 years, 65.2% were male, mean BMI was 32.8, and two-thirds were not educated. Mean length of stay was 7.8 \pm 6.7 days. Overall, the traditional cardiovascular risk factors in the patients were diabetes (70.7%), hypertension (72.8%), and dyslipidemia (57.6%). The mean SPMQ value was 1.7 \pm 1.8 for men and 3.0 \pm 1.4 for women. The mean handgrip strength value was 26.4 \pm 6.9 for men and 16 \pm 4.2 for women. The mean SPPB value was 9.0 \pm 2.9 for men and 6.0 \pm 2.7 for women.

Conclusion

Female cardiac patients are significantly frailer than male cardiac patients by the three functional tools.

Increasing patient and family awareness of the Patient's Bill of Rights (PBR) in the hospital: a quality improvement project

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Background

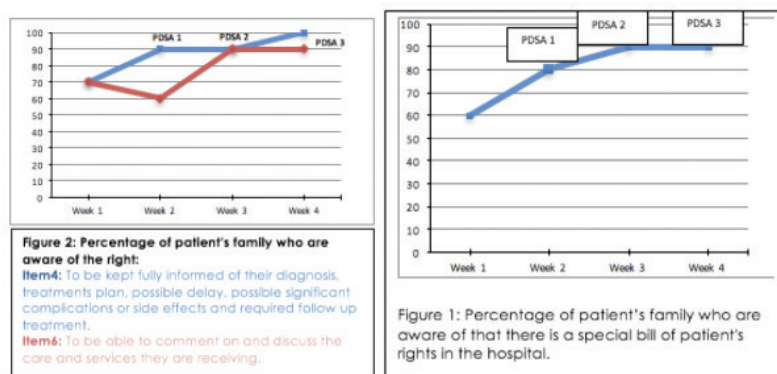
Patient satisfaction becomes a significant part of high-quality health care. Patient awareness of the Patient's Bill of Rights (PBR) is essential to provide patient-centered care. Baseline data showed that at least 30% of patients and families were not aware of the PBR, namely item 4 ("To be kept fully informed of their diagnosis, treatments plan, possible delay, possible significant complications or side effects and required follow-up treatment") and item 6 ("To be able to comment on and discuss the care and services they are receiving"). This project aimed to increase patient and family awareness of the PBR by 50% from baseline within 2 months in a pediatric medical unit.

Methods

This study was performed in a pediatric medical unit within a tertiary hospital in Riyadh, to test patients' and families' awareness of the patient's right. A fishbone diagram was used to identify contributing factors to the problem. Interventions included (1) educating nurses about the responsibility of implementing and complying with the policy and procedures that govern PBR, (2) providing patients with a copy of the PBR as part of their admission information package, and (3) conducting an awareness week in the unit about PBR to promote and empower patients and families with knowledge about PBR. Several PDSA cycles were used to test these change ideas. Pre-post intervention assessments were conducted to assess patients' family orientation of their rights in the hospital. Data were collected, analysed, and presented in a run chart.

Results

Patients' awareness of their rights in the hospital significantly improved to 90%. Moreover, awareness of items 4 and 6 of the PBR improved to 100% and 90%, respectively, compared with the baseline data. More importantly, nurses and physicians recognized the positive change in families' attitudes after the project implementation.



Conclusion

Promoting awareness of patients' rights plays a significant role in improving patient experience in the hospital. Also, the results offer an important opportunity for healthcare organizations to improve patient and family-centered care. The main limitation of this project was that this effort was conducted in a single department.

The impact of a pharmacist-led renal dosage adjustment program on renal drug dosing errors

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Background

Renal drug dosage adjustment is crucial for the safety of patients with renal impairment. Studies have reported the prevalence of inappropriate dosing in this population to be around 50%, which is significantly reduced with pharmacist intervention. The objective of this study is to assess the change in proportions of renal drug dosing errors following the implementation of a pharmacist-led renal drug dosing adjustment program.

Methods

This is a quasi-experimental study designed to include hospitalized adult patients with a creatinine clearance of less than 60 mL/min. The study consists of three phases. The pre-phase and post-phase will evaluate drug orders for dosing appropriateness. During the intervention phase, a renal drug dosing adjustment program was implemented, which includes educational sessions on dosing in renal insufficiency and a renal drug dosing guidance for all formulary agents. The primary outcome is the change in the proportions of dosing errors following the intervention. Secondary outcomes include identifying the most common pharmacological drug classes associated with dosing errors, the frequency of pharmacists' interventions, and the proportions of dosing errors in various stages of chronic kidney disease (CKD). A sample size of 344 orders in each study phase is required to provide a power of 90% to detect a 50% difference in the primary outcome.

Results

To date, 141 of the 492 orders that were screened in the pre-phase required renal dosage adjustment. Inappropriate dosing was noted in 29 (20.5%) orders. Antimicrobials were associated with the highest prevalence of dosing errors (48%). Pharmacists intervened in 17% of all inappropriate orders. The majority of the errors were reported in CKD stage 3b (24%) and endstage renal disease on dialysis (37.9%).

Conclusion

The study is ongoing until the desired sample size has been reached.

Reducing the events of adverse reaction associated with blood donation in young blood donors

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Background

The Transfusion Medical Services (TMS) is required to ensure donor and patient safety. Studies have shown that young donors are more likely to experience blood donation-related adverse reactions. The AABB Standard 5.4.3.1 requires reducing the risk of reactions in young donors and improving the young donor experience. This project aims to reduce the difference in the rate of adverse reactions between young blood donors and regular adult blood donors to zero, from a baseline of 58.19%, within 5 months.

Methods

This quality improvement project had an observational design with data collected and compared before and after the intervention, plotting data over time using a statistical process control (SPC) chart. The main outcome measure was to assess if there is any significant reduction in the difference in the percentage of adverse reaction events between young donors and adult donors throughout the course of the project from the baseline of 58.19%. The team started the intervention on 15 October 2016 and PDSA cycles were used to test and evaluate the set of interventions, including standardizing and automating the work process of managing young blood donors. Three PDSA cycles were conducted, aiming to achieve the improvement aim of the project. The data were collected and analyzed using QI Macro SPC for Excel.

Results

Pre-post intervention analysis results showed a large reduction in the events of adverse reaction in young donors below those events encountered by adult donors. The work process of managing young blood donors to eliminate risks that lead to unwanted donation experience has improved as well.

Conclusion

The project intervention had a clear impact on reducing the rate of events of adverse reaction encountered by young donors below those in adult donors as a results of staff compliance with policies and procedures. A standardized work process of managing young blood donors to eliminate risks that can lead to unwanted donation experience should be established to enhance donor safety.



Extravasation and infiltration injury prevention, early detection, and early management in the pediatric population

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Background

On 25 May 2016, a sentinel event occurred to one of our patients as a result of extravasation injury. The goals of this project were to prevent sentinel events due to extravasation injury, provide antidote within one hour, and guide nursing practice according to the best evidence base.

Methods

- Clinical bundle created.
- Clinical education.
- Extravasation kit availability.
- Best evidence reviewed.
- Previous SRS reviewed as baseline data.

Results

The compliance rate in the clinical area for the bundles was 100% for hourly check and SRS, 93% in nursing documentation, 74% for reporting the case, 96% for medical team assessment, 44% for family education, 53% for volume aspiration, 66% for volume infusion, and 26% for providing antidote within one hour. DPP created.

Conclusion

Increasing nurses' knowledge and provision of an antidote will prevent any serious complications caused by extravasation injury.

Understanding the role “relationship” plays in being an effective preceptor in the clinical setting to enhance quality patient care

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Background

As a profession, nursing accepts the responsibility of assuring competence of its workforce to protect public safety, and preceptors play a key role in this process. Precepting is an organized, evidence-based, outcome-driven approach to assuring competent practice (Eley, 2015). The Department of Nursing Education & Professional Development (DNE & PD) currently delivers a structured preceptorship workshop to support the development of preceptors into their new role. Kramer’s 1974 model of reality shock for the new employee, preceptee, is the current model used within the “preceptor-preceptee relationship” session. The goal of this study is to provide readers with knowledge of the exemplary role “relationship” plays in being an effective preceptor in the clinical setting.

Methods

A systematic review was performed using literature from Nursing Reference Center and CINAHL Complete. The following keywords were used: preceptorship, preceptee relationship. Inclusion criteria: studies focusing on the relationship factor during orientation of a new employee nurse; studies must be in English and within the period 2007-2017. The search identified 2060 articles, of which five were used for the study.

Results

interest in the new employee’s development, as well as having a structured unit orientation program. Implementing the findings: alterations were made in the “preceptor-preceptee relationship” session to incorporate the new findings. The outcomes were measured using the evaluation completed by attendees of the workshop.

Conclusion

In addition to the current workshop, a structured proficiency checklist that incorporates domains such as “effective working relationship” will support the building of a healthy relationship between the two parties, thus exemplifying quality patient care.

Prevention of endotracheal tube obstruction in intubated patients

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Background

Endotracheal tube (ETT) obstruction in mechanically ventilated patients is a potentially life-threatening event. In our adult intensive care units (ICUs), we have observed multiple incidents of ETT obstruction within a short period. This project aimed to identify causes of ETT obstruction and determine the required changes in clinical practice to prevent such incidents.

Methods

This is an ongoing quality improvement project at the Adult Intensive Care Department of King Abdulaziz Medical City-Riyadh. A multidisciplinary task force analyzed the ETT obstruction incidents to determine the root cause and made recommendations.

Results

Between 25 October 2016 and 3 January 2017, eight incidents of ETT obstruction were reported in six different adult ICUs. The source of admission was the emergency department in five patients, other hospitals in two, and the ward in one. The incidents occurred on average 9 days after intubation (range 5-14 days). ETT obstruction was associated with cardiac arrest in one patient. A major root cause of ETT obstruction incidents was determined to be the overuse of passive humidification of inhaled gases during mechanical ventilation (MV). The task force recommended educating ICU staff about ETT obstruction signs; limiting the use of passive humidification to patients requiring MV for less than 4 days; and use of active humidification for patients who required longer MV duration, had acute respiratory distress syndrome, or had thick or bloody respiratory secretions. The taskforce also recommended continued auditing of ETT obstruction incidents and ventilator care practices.

Conclusion

ETT obstruction in our ICUs is likely to be caused by passive humidification during MV. Its prevention requires changes in ventilator care. Auditing ETT obstruction incidents and monitoring ventilator care practices are required.

Timely administration of the first antibiotic dose in sepsis: an ongoing quality improvement project in the ICU

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Background

The timely administration of appropriate antibiotics is associated with improved outcomes in sepsis. Nevertheless, delays are often encountered. We observed a significant increase in the time from the electronic antibiotic order to intravenous administration (Tabx-oa) in our intensive care unit (ICU) shortly after implementing a new health information system (Best Care). In this study, we assessed the impact of a quality improvement project on Tabx-oa in the ICU.

Methods

This ongoing quality improvement project in the general and trauma ICUs of King Abdulaziz Medical City-Riyadh aims at administering the first antibiotic dose within 60 minutes of electronic ordering. The project included educating medical and nursing staff about the importance of timely antibiotic administration and advocating ordering the first dose as STAT. Additionally, the ICU antibiotic order set in Best Care was modified such that each antibiotic order was preceded by a STAT dose.

Results

In the general and trauma ICUs, Tabx-oa was 92 ± 94 minutes in Sep-Dec 2014 (98 prescriptions) and 148 ± 124 minutes in Jan-Mar 2016 (90 prescriptions) just after implementing Best Care ($p=0.001$). In Dec 2016-Jan 2017, Tabx-oa went down to 86 ± 50 minutes (48 prescriptions; $p=0.001$). In the general ICU, Tabx-oa was 80 ± 53 minutes compared with 98 ± 41 minutes in the trauma ICU ($p=0.26$). In Jan-Mar 2016, Tabx-oa was ≤ 60 minutes in 29% of prescriptions, 61-120 minutes in 22%, and >120 minutes in 49%. In Dec 2016-Jan 2017, Tabx-oa was ≤ 60 minutes in 29% of prescriptions, 61-120 minutes in 50%, and >120 minutes in 21% ($p=0.001$ compared with Jan-Mar 2016). Tabx-oa ≤ 60 minutes was more common in the general ICU compared with the trauma ICU (39% versus 7% of prescriptions; $p=0.04$).

Conclusion

Our intervention was effective in reducing the time to antibiotic administration. However, the time from the electronic order to intravenous administration of the first antibiotic dose remained longer than 60 minutes for most prescriptions. The antibiotic ordering and administering processes should be subjected to further improvement cycles.

The Comprehensive Unit Safety Program for Mechanically Ventilated Patients (CUSP 4 MVP) Project in Saudi Arabian intensive care units

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Background

The objective is to describe the results of a multicenter national quality improvement project for improving the care of mechanically ventilated patients.

Methods

15 intensive care units (ICUs) from six hospitals in Saudi Arabia participated in the Comprehensive Unit Safety Program for Mechanically Ventilated Patients (CUSP 4 MVP) Project in collaboration with the Armstrong Institute for Patient Safety, Johns Hopkins University, over a 1-year period (Nov 2015 to Nov 2016). The project included multiple interventions (CUSP team formation, training, audit, and feedback) to improve several aspects of the care of mechanically ventilated patients following evidence-based guidelines. We compared the performance of different indicators in the last 4 months versus the first 8 months of the project.

Results

The cohort included 10,124 patient days for 2634 patients. Over the intervention period, there was a significant increase in the use of subglottic endotracheal tubes from 43% (663/1542) to 57% (287/505; $p<0.0001$), an increase in days without sedation from 54% (3816/7017) to 71% (2197/3111; $p<0.0001$), and an associated reduction in mortality from 21% (372/1747) to 16% (147/887; $p=0.005$). There was no significant change in ventilator-associated events or the duration of mechanical ventilation.

Conclusion

This project demonstrates the feasibility of performing a multicenter quality improvement project. Over the relatively short period of time, there was significant improvement in key indicators of the care of mechanically ventilated patients with a reduction in mortality. A large-scale project with a longer duration may have greater impact on the care of mechanically ventilated patients in Saudi Arabia.

Reducing CLABSI in cancer patients utilizing local resources: a third world comprehensive cancer center experience

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Background

Central-line-associated bloodstream infection (CLABSI) represents a major challenge for healthcare systems around the world. In addition to the major cost associated with dealing with CLABSI cases, these infections are associated with high mortality, particularly in cancer patients with compromised immunity.

Methods

A quality improvement project was initiated at our center because of the high reported rates of CLABSI in 2012. A FOCUS-PDCA approach was implemented for the project. After careful evaluation of central venous catheter (CVC) insertion and maintenance practices, we identified a huge gap in employees' awareness of the problem and its impact, lack of knowledge of best practice guidelines for CVC insertion and maintenance, grossly insufficient supplies for CVC insertion, and a lack of comprehensive policy for CVC insertion and maintenance. On the basis of these points, our improvement strategy included the following: educating and training healthcare personnel who insert and maintain CVCs, use of maximal sterile barrier precautions during insertion, use of chlorhexidine skin preparation with alcohol for antisepsis, use of ultrasound guidance for CVC insertion, a mandatory checklist for every CVC insertion, and prompt removal of CVCs as soon as they are not needed.

Results

Multiple comprehensive education sessions were performed for all employees who insert and maintain CVCs, a clear comprehensive policy was established for CVC insertion and maintenance, all necessary supplies were bundled in a home-made CVC insertion kit until the factory-made maximal barrier CVC insertion kit was made available, and a complete checklist was mandated for every CVC insertion. After project implementation, we were able to reduce the CLABSI rate by 52%, from 8.5 to 4.47 CLABSI per 1000 central-line days, over a 12-month period.

Conclusion

Utilizing our local resources at King Hussein Cancer Center and the highest standard for quality improvement projects, we were able to reduce the CLABSI rate by 52% over a 1-year period.

Chasing zero: reducing CLABSI rates in the NICU

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Background

The use of central-line catheters has permitted life-saving treatment for critically ill neonates; however, central-line-associated bloodstream infection (CLABSI) increases morbidity and mortality, hospital stay, and cost. In intensive care units (ICUs), the CLABSI rate is about 5.3 per 1000 central-line days, which increases to 11.3 per 1000 for patients weighing less than 1 kg. The incidence of CLABSI in our neonatal intensive care unit (NICU) was 3.2 per 1000 central-line days in 2013 and our aim is to reduce CLABSI by 20% per year until we reach zero.

Methods

A multidisciplinary quality improvement project was implemented using the CLABSI insertion and maintenance bundle checklist, chlorhexidine-impregnated caps, daily unit-based hand hygiene audit and awarding of champions, nurse empowerment to stop and correct physicians during central-line procedures, unit-based competency for nurses and physicians dealing with central lines, physician-only weekly dressing of percutaneous indwelling central catheter, and standardized practice of central-line blood extraction by nurses.

Results

Through the implementation of the multidisciplinary quality improvement project, we were able to decrease the CLABSI rate from 3.4 per 1000 central-line days to 1.4 per 1000 in 2014 and sustained zero CLABSI for 710 days from November 2014 to November 2016.

Conclusion

It was a challenge to reduce CLABSI rates, especially in the NICU with immune-compromised patients. The well-supported programs that include staff awareness of infection risks and collaborative team effort resulted in an effective implementation of the program, thereby decreasing CLABSI until we reached zero, surpassing the international benchmark.

Applying standard preventive measures leading to a significant reduction in catheter-associated urinary tract infections in an adult ICU

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Background

Catheter-associated urinary tract infections (CAUTIs) are common and related to significant patient safety issues, morbidity, and cost. The objective of this study was to assess the impact of applying the standard nursing and infection control measures for the reduction of CAUTI in an adult intensive care unit (ICU).

Methods

Data were collected from the adult medical and surgical ICUs (28 beds) of a 550-bed tertiary-care center from 1 July 2007 to 31 December 2009. CAUTI surveillance was performed by the infection control department. We examined the interventions implemented by the ICU team beginning in 2011, in relation to the changes in the rate of CAUTI. A nursing-led team was developed to monitor and implement the interventions as recommended by the ICU department. Interventions consist of (1) patients are screened on admission, (2) patients are subject to use of a silicon catheter, (3) aseptic insertion techniques, (4) emptying bag three-quarters via closed circuit, (5) using appropriate catheter size, (6) securing the draining tube on the thigh, (7) keeping the catheter bag below patient bladder level and not touching the floor, and (8) removing the catheter as soon as possible. Hand hygiene protocols were enforced by the infection control department.

Results

The rate of UTIs and urinary catheter utilization ratios at an adult ICU of KAMC-Jeddah were collected by the infection control department from 2008 to 2016. There was a mean of 6175 catheter days per year for the ICU unit. Despite the overall rise in the urinary catheterization ratio (Figure 1) over these years, we observed a reduction in the UTI rate per 1000 urinary catheter days with a significant reduction noted from 2.3 in 2010 to 0.3 in 2011, which was sustained throughout 2016.

Conclusion

We found that the monthly rates of CAUTI significantly declined after the enforcement of strategies to prevent CAUTI in the ICU. This study also highlighted the importance and the need for a standardized CAUTI care bundle.

Patient safety in a neonatal intensive care unit in Saudi Arabia: a survey

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Background

The neonatal intensive care unit (NICU) is a complex environment caring for fragile and vulnerable patients. In this study, we aim to assess the awareness of patient safety culture in an NICU in Saudi Arabia.

Methods

This was an online survey with 25 questions, distributed by convenient sampling to measure two scales: level of awareness and acknowledgment of availability, and implementation of safety guidelines and infection prevention.

Results

151 participants responded to this survey. 97 (64.2%) were female, with the highest (70 [46.4%]) proportion of respondents in the 30-40-year age group. More than half (85 [56.3%]) were nurses, 61 (40.4%) were physicians, and only five (3.3%) were respiratory therapists. 84 (55.6%) work rotation shifts, 59 (39.1%) work day shifts, and eight (5.3%) work night shifts. The survey results showed a high level (85.4%) of safety awareness among NICU staff, and a high proportion (89.7%) acknowledged availability and implementation of guidelines and safety measures in their units. Univariate and multivariate analysis showed some factors, such as time of shift, number of beds, and job position, to be associated with the level of safety awareness. Multiple logistic regressions revealed that staff who work day shifts have double the level of awareness of patient safety compared with those working other shifts; units with a smaller number of beds are 50% more aware than units with larger numbers of beds, and those in a non-physician position are 60% more aware than physicians with regard to their level of patient safety awareness.

Conclusion

Healthcare decision-making authorities should adopt a national patient safety program customized for NICUs to improve patient safety culture.

Prescribing errors in hospitalized children with cancer

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Background

Errors during prescribing are common. Many studies have investigated the causes of prescribing errors made by junior doctors (foundation trainees) but none (few) have investigated the causes of errors made by more senior doctors such as staff physicians, assistant consultants, and consultants. The aim of this study is to investigate the causes of prescribing errors made by senior doctors to help design an effective intervention to mitigate errors.

Methods

This was a two-phase study in a 24-bed pediatric oncology ward at King Abdulaziz Medical City-Jeddah. The two phases consisted of a 2-month quantitative phase to collect error data from the pediatric oncology ward and a 2-month qualitative phase using focus groups with doctors to collect data about causes of prescribing errors.

Results

These results are preliminary. The Yorkshire Contributory Factors Framework (YCFF) was used to analyze the causes of prescribing errors and the following factors were ascertained: situational factors (children with cancer, lack of knowledge, default thinking, lack of effort, relying on safety measures, maintaining team relationships, over-trust of others, and complex task of prescribing), local working conditions (new staff, staff workload, and unclear delegation of responsibilities during the shift), latent factors (non-ideal prescribing environment, poor access to supportive care guidelines, and lack of joined-up protocols), and general factors (safety culture, poor/ineffective communication, and poor documentation).

Conclusion

Some causes of error were similar to those made by junior doctors, such as lack of knowledge and workload. Other causes were unique to senior doctors such as lack of effort to obtain information from the patient when prescribing and maintaining team relationships, especially when consulting other teams. Tailoring safety measures according to the causes of errors is needed for effective intervention.

Sustaining improvement of postoperative handover process in a tertiary-care hospital in Saudi Arabia

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Background

Ineffective communication among healthcare providers in the postoperative period is common and may jeopardize patient safety and adversely affect patient outcomes. In this project, we examine the sustainability of an improvement project that aims for effective postoperative handover in a tertiary-care hospital.

Methods

A quality improvement project was conducted in May 2015 at the surgical intensive care unit (ICU) of King Abdulaziz Medical City-Riyadh to improve the postoperative handover process. The project stakeholders were physicians (surgeons, anesthesiologists, and intensivists), nurses (operating room [OR], ICU), and the hospital administration. The project had multiple phases. In the pre-implementation period, an assessment tool was generated to measure the elements of the handover process. For purposes of measurement, a postoperative handover bundle was created that consisted of the presence of physicians from the three disciplines at the bedside on arrival at the ICU. In the preparation phase, a multidisciplinary team generated a postoperative handover checklist that included several elements filled by these disciplines. In the implementation phase, all involved disciplines oriented on the new handover process. Compliance with the process was measured and feedback was provided to the involved departments on a regular basis. We examined compliance with the postoperative handover bundle for the 16 months following the initiation of the project.

Results

In the pre-implementation period, compliance with the postoperative handover bundle was 0%. In the 16 months post-implementation, there were 407 postoperative handovers and compliance with the bundle increased to 91.7%. On the postoperative handover forms, documentation by surgeons of anticipated surgical problems in the first 24 postoperative hours was specified in 90.09%, feeding plan in 90.17%, prophylaxis for deep vein thrombosis in 88.69%, and family update in 83.04%. Documentation of difficult airways by anesthesiologists was 90.41%. Predefined outcome measures were documented for 118 patients: intubation within 6 hours of ICU admission in 0.84%, fluid resuscitation or adding vasopressors within 1 hour of ICU admission in 15.25%, unplanned return to OR in 0.84%, and cardiac arrest in 0.84%.

Conclusion

Implementing a postoperative handover checklist and bundle was sustainable 16 months after initiation. Additionally, documentation of critical information was achieved for most patients post-implementation. This improvement in the process of handover and in communication was reflected in patient outcome.

Failure to rescue (FRT): a nursing-led quality improvement project for resuscitation care

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Background

Despite 2 yearly advanced life support courses and policies, procedure, and guidelines, we had proven that system failure can prohibit us from getting the right people with the right equipment and right training to the right person at the right time. This quality improvement project aimed to improve bedside resuscitation care and optimize patient safety.

Methods

This project involved the following strategies: introduction of dedicated adult and pediatric clinical resource nurse positions who developed first responder BLS and ALS guidelines and standardized multidisciplinary simulation training; setting a gold standard of 60 minutes crash cart ready for use and standardization of resuscitation equipment; staff support through post-resuscitation debriefings using the high reliability organization approach, empowerment of critical care nurses to use the automatic external defibrillator, auditing process of code blue record and crash cart ready for use process.

Results

After extensive root cause analysis, multidisciplinary simulation training, and continued support, the following achievements were made: standardized privileging simulation training for physician team leaders (PTL) and critical care nurses, ongoing first responder training with clear role expectation and situational awareness focus, observable increase in familiarity with resuscitation equipment and processes; implementation of hospital resuscitation zones with specific advanced life support responding teams to ensure response time within 5 minutes of the hospital; senior medical residents simulation program to assume the PTL role.

Conclusion

This project supports the accumulated evidence that simulation training with structured debriefing is essential in improving skill retention and confidence of all involved healthcare members. Interdisciplinary team communication, assertiveness of involved healthcare members, closed loop communication, early recognition, and early intervention dramatically improved.

Preventing baby-mother mismatch: the feasibility of a nursery safety checklist

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Background

Newborn babies are a vulnerable patient group and hospital policies and procedures are developed to further protect their safety and security within the organization, including correct identification. However, our experience reveals that there were inconsistent practices in the proper identification of newborn babies during rooming in and examination, which had led to issues of baby-mother mismatch. The use of name cards containing the mother and baby's MRN has contributed to this problem while the Hugs and Kisses system has inadvertently created a sense of complacency among staff. We previously developed a nursery safety checklist to be jointly completed by nurses during shift handovers to ensure that the correct babies are with the right mothers or in the right bassinet at all times.

Methods

A single-center, prospective time series study was conducted with a convenience sample of 44 nurses and interns working in the nursery. All participants were trained in the completion of the nursery safety checklist. The primary outcome was completion of the checklist. We also measured the acceptability of the checklist using a local patient safety survey.

Results

There were 268 babies in the unit pre-intervention (20 Nov 2016 to 19 Dec 2016) and 256 post-intervention (20 Dec 2016 to 19 Jan 2017). The checklist was completed for all babies. All participants agreed that the nursery safety checklist promotes correct baby identification and encourages communication and teamwork. Overall, 98% believe that it will prevent the potential problem of baby-mother mismatch. The participants further suggested the need for continuous teamwork and effective communication and the education and active involvement of mothers in the newborn identification process.

Conclusion

The nursery safety checklist was acceptable to the frontline staff, particularly nurses who spend a significant time rooming in babies with their mothers and providing medication and treatment. The checklist proved to be a very practical and dependable safety measure for consistent newborn identification.

Viability of a hemodialysis time-out safety checklist (HTSC) for patients undergoing dialysis outside the hemodialysis unit

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Background

Hemodialysis is a complex and invasive procedure that presents risk to vulnerable patients. The use of a checklist is one strategy that has demonstrated patient safety improvement in the hemodialysis procedure by promoting communication, teamwork, and consistency of care. Since the potential for adverse incidents (including patient misidentification) could be higher in patients dialyzed outside the dialysis unit, we developed a hemodialysis time-out safety checklist (HTSC) for this cohort of patients. The aim of this study is to determine the effectiveness of this checklist for patient safety.

Methods

After tailoring an HTSC from published literature to our setting, we conducted a purposive study in 100% of patients dialyzed outside the unit from 1-14 January 2017. All nursing personnel were trained to use the HTSC. The primary outcome was completion of the HTSC, and data were analyzed on a weekly basis.

Results

33 dialysis treatments were provided outside the hemodialysis unit. Overall, the HTSC was completed for 31 (94%) of the 33 dialyses. During the first week, a total of 16 patients were dialyzed, however, only 14 (88%) forms were completed. During the second week, the patient addressograph, patient identification, valid dialysis order, and verification by the HD primary nurse were demonstrated to be 100% (n=17). With nursing handover (ISBAR), 94% (16/17) compliance was noted. No adverse event has been reported since the introduction of the checklist.

Conclusion

Teamwork and effective communication between and among staff and departments are essential components of patient safety to ensure that the right patient gets the right care and right treatment at the right time. The use of the HTSC has demonstrated improvement in patient safety by ensuring that the dialysis nurse and the unit nurse communicate with each other and work together to properly identify the patient prior to the dialysis procedure.

Learning from adverse events: implementing the After Action Review (AAR) methodology as a patient safety tool

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Background

In May 2016, we introduced the use of After Action Review (AAR) methodology to review near-misses and incidents in KAMC-Jeddah. An AAR is a discussion of an event that enables the individuals involved to learn for themselves what happened, why it happened, what went well, what needs to be improved, and lessons learned. While AAR has been used extensively in the military and project management, its use in healthcare, particularly in the Kingdom, has been very limited. The aim of this project is to analyze and assess the value of AAR as a patient safety tool.

Methods

Mixed methods of thematic analysis and staff survey were used to examine and evaluate all AARs that were conducted from May to December 2016 (n=15) by the same trained facilitator. An evaluation questionnaire consisting of 15 questions was sent to all staff who had participated in an AAR (n=54).

Results

Of the 15 AARs, nine (60%) of the incidents reviewed were no-harm events; 51 action plans were identified and 73% have been completed to date. The causes of the events were multifactorial, although non-compliance to policy and procedure and communication issues were major contributory factors. Of the 39 staff who participated in the survey (72% response rate), 98% agreed that the AAR method was appropriate and timely and all felt that the general atmosphere during the AAR was conducive to discussion and learning; 99% found the AAR process focused on learning and reflection. Likewise, 99% agreed that participating in an AAR has further encouraged them to report and speak up for patient safety.

Conclusion

IT systems are key components of a multifaceted strategy to prevent medication errors and improve patient safety.

Improving time to diagnosis and initiation of cancer therapy

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Background

Delays in diagnosis and initiation of cancer therapy pose serious risks to patient health and outcomes. We identified delays in diagnosis of patients with suspected cancer and initiation of treatment. Our project aimed to reduce times for diagnosis and initiation of therapy to less than 30 days at each stage, benchmarking to the UK standards.

Methods

A multidisciplinary team involving relevant specialties was formed. The flow of patients with suspected cancer was mapped and a central coordination process was established to streamline patient flow and monitor indicators. The various scenarios of patients referred were identified and a flow algorithm was created. Data for type of referral, source of referral, time to diagnosis, and time to treatment were captured. Feedback to services was given in a timely fashion. Involvement of most responsible physicians (MRPs) was pursued at all times. A dedicated clinic was established for cases that require special help.

Results

The 3-year data (2014, 2015, and 2016) are shown in the table below. Time to diagnosis and time to initiation of treatment were reduced to 15 days and 24 days, respectively.

	2014	2015	2016
Number of referrals (patients)	106	257	319
Number of diagnosed cancers (%)	49 (46%)	50 (19%)	149 (46%)
Time to confirm diagnosis (days)	37	30	15
Time to initiate treatment (days)	52	29	24

Conclusion

The goal of shortening the time to less than 30 days was achieved in 2015 and maintained in 2016. Expansion and sustainability of the program is underway to assure continuation of this success. This will be achieved by embedding the algorithm into the work process of different services.

Oxygen therapy target for critically ill patients

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Background

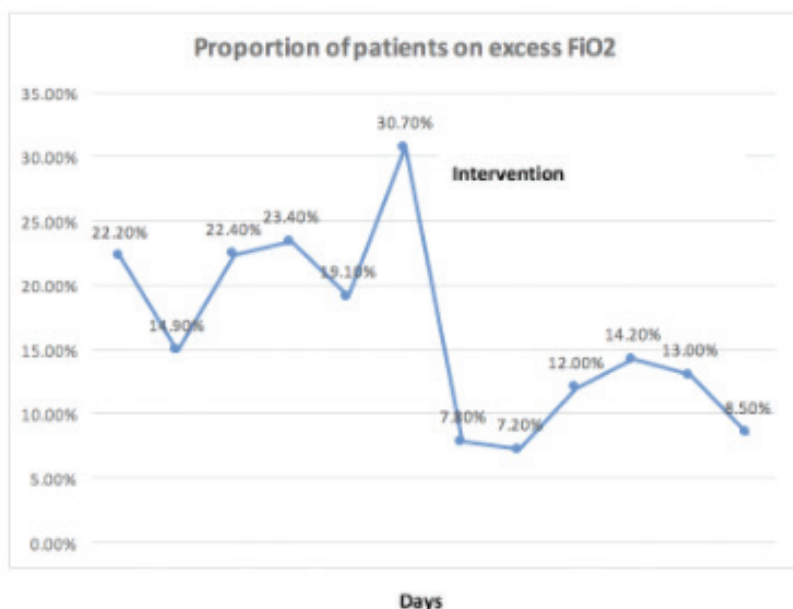
Critically ill patients are often managed with an excess of fraction inspired oxygen (FiO₂). Hyperoxia has been strongly linked to harm in patients in the intensive care unit (ICU). The objective of this pilot study is to reduce the proportion of patients who receive excess FiO₂ in the ICU.

Methods

Excess FiO₂ is defined as target SpO₂ of 97-100% on at least FiO₂ of 0.4. FiO₂ and SpO₂ data were collected for patients in the medical, trauma, neuro, surgical, burn, hematology/oncology, and intermediate care units daily over 6 days (394 patient measurements). An email was then sent to all respiratory therapists (RTs) to avoid excess FiO₂ administration and respiratory therapist team leaders instructed their RTs to avoid excess FiO₂. FiO₂ and SpO₂ data were collected again in all the units daily for 6 days (417 patient measurements).

Results

The average percentage of patients who were receiving excess FiO₂ decreased from 22.1% to 10.5%. The chart below shows the daily percentage of patients receiving excess FiO₂ pre- and post-intervention.



Conclusion

Simple education resulted in a significant reduction in excess oxygen therapy in the ICU. This will result in prevention of significant harm to critically ill patients. Continuous education and increased awareness of the harmful effect of excess oxygen therapy are essential for improving patient safety.

Can implementing the Perfect Week initiative make a difference in improving patient flow and discharge processes? Acute medical services in pursuit of perfection: breaking the cycle

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Background

Timely discharge contributes to effective, patient-centered, and harm-free care. With an ageing population and resource constraints, achieving timely discharge remains a challenge. Growing evidence shows that increased length of stay directly impacts patient flow. We used the Perfect Week initiative as the model for change. This healthcare strategy, which originated in the UK, results in improved patient flow and discharge processes by "recalibrating" systems. Our study aims to (1) improve flow of medical patients by implementing the SAFER (senior round, assessment order, flow, early discharge, review) bundle metrics; and (2) improve the discharge process by creating a daily multidisciplinary team (MDT) huddle.

Methods

We conducted our study in the medical wards of KAMC-JD from July 2016 to December 2016. The intervention began in October 2016 at the launch of the Perfect Week initiative. Planning and debriefing occurred daily during the MDT huddle, which also highlighted concerns and opinions, and generated small-change improvements. Data included bed crisis alerts at baseline (Jan-Sep 2016), and 3-month pre- and post-intervention data for (1) average length of stay (ALOS), (2) discharge-order time by 1300 hours, and (3) MDT huddle satisfaction survey post-intervention. Mini Tab (V17) was used for data analysis. ALOS was provided by Hospital Information Management.

Results

The baseline data for bed crisis was 93 alerts versus one alert post-intervention. ALOS reduced by 47% post-intervention, from 10.4 to 5.5 days. Discharge order compliance was 471 (44%) of 1067 pre-intervention compared with 652 (52%) of 1246 post-intervention. MDT huddle survey results showed that 21 (91%) of 23 staff felt that patient care was coordinated, and communication and team work had improved, while 19 (83%) of 23 agreed that the MDT positively prevents delayed discharges.

Conclusion

Implementing the Perfect Week initiative, SAFER bundle metrics, and MDT huddle have all made a positive difference in improving patient flow and discharge processes. Future aims include creating a dashboard and scorecard for further optimization.

Reducing the occurrence of birth-related injuries in a labor and delivery unit at a tertiary-care center

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Background

Birth-related injuries are a major public health problem in our medical city, King Abdulaziz Medical City (KAMC), affecting our patients' expectations. The number of birth-related injuries has been found to be higher than expected and exceeds international figures. Our aim is to reduce the occurrence of birth injuries by 50% by the end of February 2017 through implementation of intrapartum pathways and protocol using quality improvement tools.

Methods

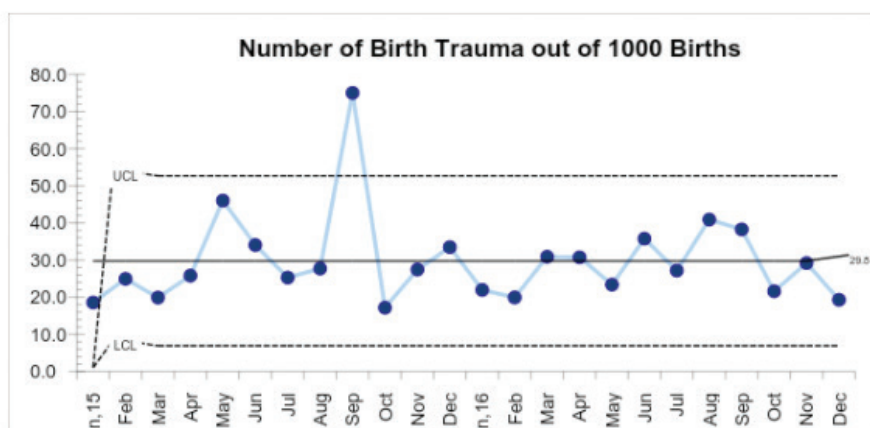
Multiple initiatives were started from January 2015 until December 2016. We performed a root cause analysis and developed a process map of current patient flow from the beginning of intrapartum care until the time of delivery to identify areas for potential improvement. We used the safety reporting system and labor and delivery unit logbook to measure and monitor the incidents. The control chart was used to represent the baseline data and the data changes after the interventions. Our interventions were to update the related department policy and protocols and to state the rules of obstetrician according to their privilege. Both interventions were started on 20 November 2016.

Results

After applying our interventions, we noticed that the number of injuries had decreased towards our goal according to our control chart. More data are needed to confirm this result.

Conclusion

Testing our improvement interventions through multiple initiatives shows that birth-related injuries can be reduced and avoided in many situations. The magnitude of the problem is clear and the cause identified. More initiatives and interventions are needed. This project is promising, with excellent effects on patient care.



Time to pharmacological venous thromboembolism prophylaxis

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Background

The incidence of venous thromboembolism is high in critically ill patients, even in the first few days of intensive care unit (ICU) admission. Timely initiation of thromboprophylaxis is pivotal to avoid life-threatening complications. We studied the timing of pharmacological prophylaxis and the frequency of unjustified delay.

Methods

This was a clinical audit in which we randomly studied 50 adult ICU patients and calculated the time between ICU admission and administration of pharmacological prophylaxis. When the time was more than 24 hours, the reasons were elucidated and classified as justified or unjustified according to the American College of Chest Physicians (ACCP) guidelines.

Results

25 (50%) of 50 patients had pharmacological prophylaxis within 24 hours of admission (80% were medical, 16% postoperative, and 4% trauma). Among the 25 patients who did not receive thromboprophylaxis within 24 hours, 56% were medical, 12% postoperative, and 32% trauma. Delay in pharmacological prophylaxis was justified in 20 (40%) of 50 patients. Reasons for justified thromboprophylaxis delay were active bleeding (n=8), coagulopathy with INR >1.5 (n=5), traumatic brain injury (n=2), awaiting surgery (n=2), post-neurosurgical procedure (n=2), and post-TPA administration (n=1). Five (10%) of 50 patients were considered to have unjustified delays (80% were medical and 20% postoperative). Among those unjustified medically as per ACCP guidelines (n=4 with INR >1.5) and postoperative (n=1 was missed). Three (6%) deep venous thrombosis events occurred in the 50 patients; all in patients with justified thromboprophylaxis delay.

Conclusion

Unjustified delay in pharmacological thromboprophylaxis occurred in 10% of patients and should be a target for improvement projects.

Enhancing performance of the Gastrointestinal Tumor Board by improving documentation

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Background

The tumor board contributes to providing better patient care by using a multidisciplinary team. In our efforts to evaluate the performance of the Gastrointestinal Tumor Board (GITB), it was difficult to assess past performance because of lack of proper use of standardized documentation tools. Our project aimed to improve adherence to the documentation tool and improve communication to enable us to obtain performance measures for the GITB. tools.

Methods

Four rapid improvement plan-do-study-act (PDSA) cycles were collected. The first cycle to update the case discussion summary form (CDSF) was based on expert input and previously identified deficiencies, to enhance communication and improve assessment of performance by having clear measures imbedded in the tool. The second PDSA cycles aimed to incorporate the CDSF into the electronic medical records and assess its functionality. The third cycle aimed to orient and train staff on use of the form ahead of launching it. The fourth PDSA cycle assessed our ability to obtain GITB performance measures.

Results

Adherence to completion of the CDSF was very high (94%). This change enabled us to assess the impact of the GITB according to the identified performance measures over 100 consecutive cases discussed in the GITB between January and July 2016, which were as follows: adherence to National Comprehensive Cancer Network (NCCN) guidelines was 97%; new disease findings were 10% pathology, 13% radiology, and 4% in stage. Management plans were changed in 37 (35.6%) patients. During the 3-month period after the GITB, most (73%) of the recommendations were done.

Conclusion

Implementation of an electronic standardized documentation tool improved communication among the team and enabled the team to obtain accurate data about performance measures of the tumor board.

The impact of Institute For Healthcare Improvement (IHI) Open School online course on self-reported quality and patient safety knowledge among first-year residents

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Background

The Quality Chasm report highlighted the urgent need for healthcare professionals' education on patient safety, which should be included as a core component of undergraduate and postgraduate education. Currently, our residency programs include only sporadic lectures related to quality and patient safety. To address this gap, we provided the IHI Open School online course to our residents. The goal of this project is to gather student feedback, and guide the implementation of patient safety and quality curricula.

Methods

Prior to the course, we conducted an online survey for year 1 residents using a self-developed questionnaire (tested) on quality improvement and patient safety knowledge. Upon course completion, the same survey was administered.

Results

74 residents completed the pre-IHI Open School online survey. Within a 6-month period, all participants obtained the Basic Certificate in Quality and Safety. The same group was invited to complete the post-course online survey, of whom 50 (67.5%) responded. Important examples of survey elements include:

Items	Pre-course average weighted mean scores	Post-course average weighted mean scores	Average means score difference
Patient Safety			
Fundamentals of patient safety	2.13	3.66	+1.53
Teamwork and communication	2.79	3.965	+1.18
Root cause and systems analysis	2.04	3.66	+1.62
Communicating with patients after adverse events	2.55	3.83	+1.28
Culture of safety	2.27	3.82	+1.55
Quality Improvement			
Fundamentals of improvement	1.67	3.41	+1.74
The model for improvement	1.55	3.65	+2.1
The life cycle of a quality improvement project	1.42	3.44	+2.02
PDSA cycles and run charts	1.45	3.54	+2.09

P value: significant for all.

Conclusion

This project reveals a positive impact on the residents' knowledge after completing a simple and inexpensive online educational curriculum. The next step is to build resident-led programs to promote their knowledge, experience, and to be our future leaders in quality and patient safety.

Critical care delirium prevention and management quality improvement project

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Background

Delirium is linked to poor intensive care unit (ICU) and hospital outcomes. Targeting delirium with a quality improvement project is crucial to improve patient care. The purpose of this project is to initiate a delirium care bundle based on the best available evidence that aims to: (1) reduce the prevalence of delirium in the ICU by 10% by the end of 2016; (2) achieve 80% compliance with the delirium care bundle by the end of 2016; and (3) perform a daily nursing delirium assessment of all ICU patients.

Methods

A knowledge-assessment survey was used to assess the baseline knowledge of delirium care among ICU clinicians at King Abdulaziz Medical City, Riyadh. Educational sessions were conducted based on the survey results. In addition, a delirium care bundle was implemented to improve delirium care. Confusion Assessment Method for ICU (CAM-ICU) was added into the Best Care system as a validated delirium screening tool. Compliance with daily sedation interruption, daily spontaneous breathing trials (SBT), daily CAM-ICU assessment, and mobility assessment was measured.

Results

There was a 10% reduction in the prevalence of delirium in the ICU from 26.3% in June 2015 to 16.6% in December 2016. Average compliance with daily sedation interruption by nurses increased from 51.2% to 76.8%, while average compliance with daily SBT increased from 54% to 72%. Compliance with nursing daily delirium assessment increased from 13% to 93%. There was no change in compliance for early mobility in intubated patients.

Conclusion

The results showed increased compliance with the delirium care bundle. More efforts are required to improve early mobility in ICU patients. Multidisciplinary commitment is essential to ensure the effectiveness and sustainability of delirium care.

Bringing health care in line with Vision 2030 by understanding the need and lack of public health - preventive medicine's role in patient safety issues, a wall of silence

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Background

In recent years, the primary focus on patient safety has centered on diagnostic errors, infections, falls, and medication errors. Considerably less attention has been paid to patient safety outside the hospital walls and in its surrounding premises. One commonly neglected variable is the physical environment. This has a profound effect on patient experience, yet it has become an unconsidered patient safety tool.

Methods

Health care is a complicated process and often involves multiple steps in a given healthcare visit by a patient. In 2016, KAMC had 600,706 outpatient visits and 48,648 inpatient admissions and is expanding because of its good standing and reputation. Data extraction was made possible by dozens of physical inspections and field reviews, parking space counting, numerous first-hand observations of disabled, elderly, or children crossing the road, and speaking with dozens of healthcare personals and family caregivers.

Results

Safety culture is primarily focused on preventing active failures while many latent conditions have been overlooked. Hundreds of near misses (precursors for major accidents) are happening on a daily basis because of confusing or missing road signs, blind curves, lack of traffic signals or poorly placed signals, lack of clearly marked drop-off zones for patients with special needs, poor visibility in covered parking areas, widespread smoking rules violations, absent footpaths, and recent flash floods on hospital roads. Pedestrian safety needed much attention. The long walking time between KASCH and KFMC can adversely affect urgent medical response. This is a disturbing trend across the MENA region.

Conclusion

We must assess the entire system's safety and healthcare goals periodically by having a formal, comprehensive review. By having a proactive approach to management of all safety gaps, we will raise safety standards, achieve a higher return on investment, set an example for the MENA region, and be in line with vision 2030.

Medication safety program achieves zero harm from medication errors associated with documented allergy

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Background

Medication errors associated with a documented allergy can occur at any point in the pathway from prescription to administration. These errors can cause significant morbidity and mortality. We report the impact of a multidisciplinary medication safety team (including physicians, pharmacists, health information technologists, and nurses) on medication errors associated with documented allergy.

Methods

King Abdulaziz Medical City, Riyadh, is a tertiary referral center with 1500 beds. All medication errors associated with documented allergy reported through the safety reporting system (SRS) are reviewed and analyzed by the multidisciplinary medication safety team. This team performs root cause analysis on each reported incident to determine the contributing factors. The team then trains healthcare professionals and recommends changes to hospital policies to reduce recurrence of these incidents.

Results

In 2013, documented allergy incidents associated with harm accounted for 3.4% of all documented allergy-related medication error SRS reports (n=58). In 2016, despite a substantial increase in SRS medication error reports related to documented allergy (n=263), none of these incidents were associated with harm. Zero harm from medication errors associated with documented allergy was achieved through a multifaceted approach. This was initiated, organized, coordinated, and delivered by the medication safety team. Important aspects of this program were hospital-wide allergy awareness campaigns, training sessions on allergy for all healthcare professionals (delivered as a component of the hospital Basic Medication Safety Course), development of allergy cross-reactivity algorithms as aide memoire for hospital staff, improvements to the hospital Computerized Physician Order Entry Health Informatics System allergy documentation field, and the development of alert messages for physicians and pharmacists.

Conclusion

This multifaceted approach, coordinated by the medication safety team, achieved zero harm from medication errors associated with documented allergy in our organization in 2016. The inclusion of a physician, a pharmacist, health information technologist, and a nurse within the medication safety team was fundamental to ensuring that the interventions were relevant to and supported by all healthcare professionals. Aspects of this program can be adapted to improve patient safety in any healthcare setting.

compliance in an adult cardiology unit, King Abdulaziz Cardiac Center

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Background

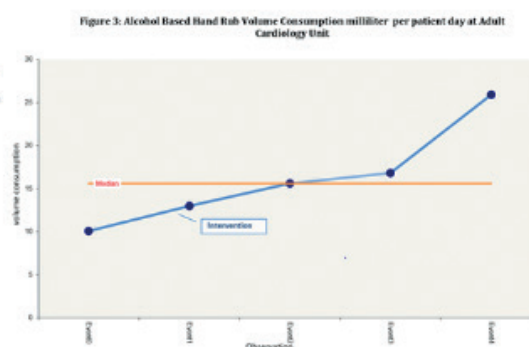
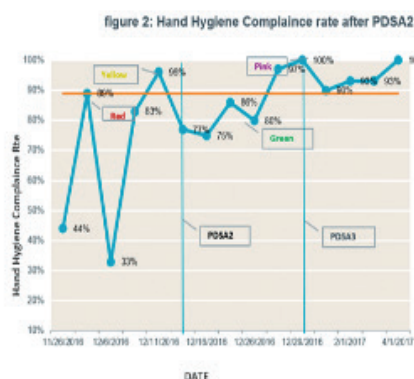
Research shows that effective hand hygiene practice is associated with decreased healthcare-acquired infections. However, adherence and compliance of healthcare workers in healthcare settings remain low. This project was initiated to improve hand hygiene compliance among healthcare workers in the adult cardiology unit, aiming to increase hand hygiene compliance to above 91% as recommended by the World Health Organization (WHO) at the unit level within a 3-month period.

Methods

Our improvement was based on the IHI Model for Improvement, testing three change ideas: (1) theory of color psychology concept, which hypothesized that a change in the color of alcohol-based hand rub will attract healthcare workers towards positive hand hygiene practice; (2) activating and using an overhead paging system to send reminders about five moments of hand hygiene; this intervention tried to inform and increase staff awareness by integrating hospital priorities (hand hygiene) throughout the system; and (3) giving frequent feedback about staff compliance with hand hygiene and involving leadership personnel in the process. Several PDSA cycles have been conducted to test the change ideas, and data have been collected on hand hygiene compliance, analyzed and presented on run charts measuring the impact of the proposed change on the process and outcomes measures, using the WHO observation tool and formula for measuring compliance.

Results

As shown in the run chart below (Figure 2), the hand hygiene compliance rate was steady above the median and our prediction of improvement was confirmed. We also noticed that hand-rub volume consumption as a process measure (Figure 3) has increased after implementing this intervention, indicating greater compliance with hand hygiene.



Conclusion

Changing the color of hand-rub dispensers might improve hand hygiene compliance, but we should not rely on it as the primary driver for hand hygiene improvement. Using a multimodal strategy to improve hand hygiene adherence could be effective, including involving senior management in any improvement project for successful change.

A multifaceted approach to prevent hospital-acquired pressure ulcers (HAPUs) in a large tertiary intensive care unit

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Background

Hospital-acquired pressure ulcers (HAPUs) have been identified by the adult intensive care unit (ICU) medical surgical nursing team as a key performance indicator as well as a patient safety initiative. The objective of this study is to achieve “zero HAPU”.

Methods

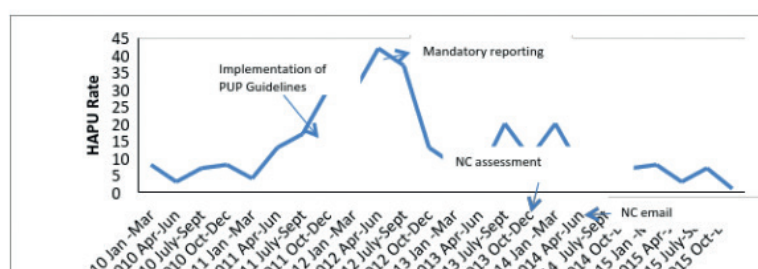
This quality improvement project was started in January 2011 and is being continued at King Abdulaziz Medical City, Riyadh, in a 21-bed adult medical surgical unit. A multidisciplinary team was formed, consisting of nurses, physicians, dietitians, wound care specialist, physiotherapists, and respiratory therapists, to ensure the implementation of pressure ulcer prevention (PUP) nursing sensitive plan of care guidelines. A dedicated high-risk PUP team member from nursing services was also allocated to support and educate staff. Monthly audits are done using the checklist developed by the HAPU team on the basis of these guidelines. The results are shared and discussed during regular nursing staff meetings as well as on a monthly basis in HAPU meetings.

Results

Between 2010 and 2015, a total of 325 HAPUs were reported, of which 31 were reported in 2010, 68 in 2011, and 121 in 2012. The incidence declined from 2013 onwards with 46 in 2013, 42 in 2014, and 19 in 2015. Comparing the three stages of pressure ulcers, stage 2 was the most frequently reported stage followed by stage 3; in the last 4 years no stage 4 ulcers were reported. The highest number of HAPUs occurred in 2012, which could be attributed to mandatory reporting.

Conclusion

Reducing the rate of pressure ulcers in critically ill patients requires a multiple approach system implemented at the same time from a tool and/or guidelines that correctly predict the risk with the active engagement of frontline staff.



A transformation to rapid assessment room (RAR) model using Lean methodology reduced emergency department waiting times and length of stay (LOS)

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Background

Emergency departments (EDs) worldwide face challenges of crowding and waiting time. Prolonged ED wait and length of stay reduce quality of care and increase adverse events. At King Abdulaziz Medical City–Jeddah (KAMC-J), a tertiary academic center, we have initiated an improvement project to reduce ED waiting times and patient LOS without adding any significant new funding, beds, or new staff.

Methods

In 2016, large transformation projects were started at our ED. We opened three rapid assessment rooms (RARs) beside the registration desk. This constitutes a change from our traditional single triage room (nurse-led triage) to the RAR model (including a physician and nurse working in unison). The new design has resulted in C-shape flow, which reduces motion waste. Lean principles were used to improve ED waiting times and LOS. Lean techniques included value-stream mapping, workplace organization, reduction of systemic wastes, and staff engagement as the main stakeholder to drive quality improvement. We measured the following metrics related to patient flow and service before and after transformation: door-to-triage (DTT) time, door-to-doctor (DTD) time, and ED LOS.

Results

Our ED has achieved a significant improvement because of the new process. Median DTT time has decreased from 13 minutes to 10.8 minutes, and median DTD time has decreased from 56 minutes to 49 minutes. More significant was the reduction in LOS from 4.75 hours to 2.9 hours. These findings represent reductions in DTT time, DTD time, and LOS by 17%, 12.5%, and 39%, respectively ($p < 0.005$). ED capacity and personnel remained constant over the entire time period.

Conclusion

Lean principles can improve the flow of patients through the ED, resulting in a reduction in ED waiting time and LOS, achieving timeliness and safety, which are important dimensions of STEEEP quality concepts.

Sonography-guided percutaneous liver biopsies in Saudi children: first safety and efficacy report from a single tertiary center

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Background

Liver biopsy remains the most reliable method to diagnose various hepatic disorders in children. In this study, we evaluated the safety and efficacy of sonography-guided percutaneous core needle liver biopsy in infants and children. This is the first Saudi study conducted in a pediatric age group.

Methods

We conducted a retrospective analysis of all patients who underwent sonography-guided percutaneous core needle liver biopsies performed by pediatric interventionists over a 5-year period at a single tertiary center, King Abdullah Specialized Children's Hospital, Riyadh.

Results

A total of 180 procedures were performed in 180 patients (99 [55%] male and 81 [45%] female), with a mean age of 45 months (age range 1 month to 14 years). The main indications for biopsies were abnormal liver enzymes (122 [66%]), evaluation of transplanted liver for rejection (51 [28%]), cholestasis (42 [23%]), diffuse hepatomegaly (29 [16%]), focal hepatic lesions (13 [7%]), graft-versus-host disease (three [1.5%]), endstage liver disease with cirrhosis (three [1.5%]), Wilson's disease (two [1%]), and immune deficiency and query fungal infection (two [1%]). Minor complications (three [1.6%]) included asymptomatic subcapsular hematoma (two) and stable small contrast extravasation to the peritoneum (one). No patients experienced a major complication, such as death, pneumothorax, abdominal wall pseudoaneurysm, and symptomatic bleeding.

Conclusion

Sonography-guided percutaneous core liver biopsy in our institute is a safe and effective procedure in children that has a high diagnostic yield and a very low complication rate.

Impact of colistin dosing on efficacy and nephrotoxicity in King Abdulaziz Medical City—Jeddah: a retrospective chart review study

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Background

Recent data on colistin dosing suggests that higher doses are required to achieve target steady state concentration. However, colistin therapy is complicated with the development of nephrotoxicity. Therefore, we aimed to determine the incidence of nephrotoxicity associated with colistin use and to identify its associated risk factors.

Methods

Adult hospitalized patients who received intravenous colistin for more than 72 hours were included. Patients with renal replacement therapy upon initiation of colistin, acute kidney injury (AKI), or who are pregnant were excluded. The primary endpoint is the incidence of AKI associated with colistin. Secondary endpoints are predictors of nephrotoxicity, the proportion of patients inappropriately dosed with colistin according to the FDA, EMA, and the proposed formula by Garonzik and colleagues, and the rate of clinical cure. A sample of 196 patients was estimated to detect nephrotoxicity of 45% with an alpha of 0.05% and 95% confidence limit.

Results

Safety culture is primarily focused on preventing active failures while many latent conditions have been overlooked. Hundreds of near misses (precursors for major accidents) are happening on a daily basis because of confusing or missing road signs, blind curves, lack of traffic signals or poorly placed signals, lack of clearly marked drop-off zones for patients with special needs, poor visibility in covered parking areas, widespread smoking rules violations, absent footpaths, and recent flash floods on hospital roads. Pedestrian safety needed much attention. The long walking time between KASCH and KFMC can adversely affect urgent medical response. This is a disturbing trend across the MENA region.

Conclusion

The incidence of AKI associated with the use of colistin is 44%. In the adjusted model, colistin dosing was not associated with increased nephrotoxicity. Future studies should evaluate the incidence of nephrotoxicity and clinical cure rates with higher doses of colistin.

Implementation of the pediatric early warning score, a pilot study in a high dependency unit – KASCH, 2016

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Background

The pediatric early warning score (PEWS) tool helps providers to detect subtle clinical deterioration in non-intensive care unit pediatric patients and intervene early to prevent significant adverse outcomes. Although several versions of PEWS exist, there is limited information about the use of such systems in different contexts. With the rapid expansion in KASCH, the need for a tool to help identify children at risk for deterioration was clearly recognized.

Methods

A modified PEWS score was used. Based on expert opinion, the action plan was modified further, aiming not to miss children at risk, and piloted in ward 69 (high dependency unit) for 4 days and nights including the weekend. More than 900 prospective observations were collected and data analyses done. This process was preceded by a mass educational activity for all personnel involved. Our aims for this pilot study are (1) to evaluate the visibility of using such a score in KASCH, (2) to evaluate nursing and documentation compliance, and 3) to evaluate our targeted outcomes (unplanned PICU admissions and out-of-PICU arrests).

Results

More than 900 observations were collected, with no unplanned PICU admissions and no out-of-PICU arrests during the pilot phase. Compliance to documentation was 70%, with collected feedback from all the team members towards increasing the work load during the pilot period.

Conclusion

PEWS may help providers to detect subtle clinical deterioration in non-intensive care unit pediatric patients and intervene early to prevent significant adverse outcomes. Further modification to space re-evaluation frequency was made, to be piloted again in high and low acuity profile units. Education is an important factor in the success of such projects.

Improving bone marrow harvest procedures in a new operating room setting

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Background

KAMC established a transplant program in 2010. In 2016 the program was moved to a new location (KASCH). This relocation included the utilization of new operating rooms (ORs) where bone marrow harvest (BMH) procedures are performed. After the move to the new facility, a high microbial contamination rate (>50%) was observed in the collected bone marrow (BM) products, which used to be less than 1% in the old facility setting. The aim of this study was to investigate the source of contamination and optimize the process to obtain contaminated-free cellular products for patient safety.

Methods

The Lean six sigma method was used to define, collect, measure, analyze, improve, and control the BMH procedure within KASCH-OR settings. Several factors were studied that might be the cause of the contamination. These factors included the number of nurses within the OR, staff traffic, BMH work process flow and staff distribution during the collection, level of education among staff involved in the harvest procedure, and the contact time after applying iodine scrub on the collection location. Several solutions were suggested and implemented.

Results

After strict implementation of the all the recommendations, a contamination rate of 0% was reached.

Conclusion

The BMH procedure requires total support from all team members and departments involved. To improve a process, collaborative work is essential.

Pioneering pediatric care: assessing the patient safety climate at King Abdullah Specialized Children's Hospital

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Background

Evidence suggests that measuring the patient safety climate predicts health outcomes. Validated patient safety culture surveys, including the Hospital Survey on Patient Safety Culture (HSOPS), have emphasized the importance of establishing a strong safety climate by addressing organizational cultural issues. HSOPS assesses staff perceptions of patient safety culture and measures teamwork, organizational learning, communication, staffing, leadership support for patient safety, overall perceptions of safety, and frequency of event reporting.

Methods

HSOPS was administered among pediatric healthcare providers in King Abdullah Specialized Children's Hospital, Ministry of National Guard Health Affairs, Riyadh, from 1 April to 15 May 2016. The objective was to identify areas of strength and improvement, offer learning opportunities for staff, evaluate cultural changes over time, and benchmark results with other hospitals.

Results

The response rate of 77% (n=1270) is higher than the US national average of 54% for hospitals submitting data to the Agency for Healthcare Research and Quality Comparative Database. Respondents included 63% nurses, 12% physicians, and 25% allied health professionals and administrators. Overall, the top three scoring areas of patient safety were teamwork within units (81%), organizational learning (79%), and frequency of event reporting (75%). The three low scoring areas were non-punitive response to error (27%), staffing (25%), and hospital handoffs/transitions (46%). Staff submitted 530 open-ended comments to describe their perceptions of patient safety and medical errors. Common themes were extracted: handovers, event reporting systems, communication among disciplines, staffing, empowering frontline staff, challenges with infrastructure, and family and patient engagement.

Conclusion

To improve patient safety culture, an action plan has been developed to share the results with senior/departmental leadership and staff to include debriefing and prioritizing organizational challenges. Recommendations for improvement include the development of safety teams, initiation of improvement projects, and establishment of a learning environment in which empowered staff improve patient care before the next survey in 12-18 months.

Patients' knowledge and attitudes towards medication disposal

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Background

Expired, unwanted, or unused prescribed medications usually end up either flushed down the sink, down the toilet, or thrown in the garbage, while some patients choose to donate medications to the poor with good intentions. Safe disposal of such medications is of great concern because misuse may lead to harmful consequences such as undesirable effects, prescription drug abuse, overstocking, incorrect dose or use, accidental overdose, or even death. Based on our observations, there is no nationwide guideline for patients for the safe, convenient, and responsible means of disposal of leftover medications. We aim to assess patients' knowledge and attitudes towards disposal of prescribed medications.

Methods

A cross-sectional self-administered anonymous questionnaire was conducted over a 4-week period at various outpatient pharmacy services.

Results

A total of 1171 participants completed the questionnaire. The results showed that 73% (representing the majority of respondents across the study) dispose of medications in the household garbage. 14% reported that they return their medications to the pharmacy, and 5% never dispose of them, while 3% give them away to friends or charity centers. More than 80% of respondents mentioned that they never received any information or advice about the safe and proper disposal of medication from their healthcare providers.

Conclusion

Our findings suggest that there is a need for the establishment of a collaborative national uniform guideline for the safe disposal of expired, unwanted, or unused medications. Additionally, a policy for drug donation needs to be included with routine patient education, along with implementation of a more proactive public program for educational awareness and collection of discarded prescription medication.

Hospital performance indicators and their associated factors in acute child poisoning at a single poison center, Central Saudi Arabia

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Background

Admission rate and length of stay (LOS) are two hospital performance indicators that affect the quality of care, patient satisfaction, bed turnover, and health cost expenditures. The purpose of this study was to identify factors associated with higher admission rates and extended average LOS among acutely poisoned children at a single poison center, Central Saudi Arabia.

Methods

This was a cross-sectional, poison/medical chart review conducted between 2009 and 2011. Exposures were child characteristics—i.e., gender, age, body-mass index (BMI), health history, and Canadian five-level triage scale. Poison incident characteristics were poison type, exposure route, amount, form, home remedy, and arrival time to center. Admission status and LOS were obtained from records. Chronic poisoning cases were excluded. Bivariate and regression analyses were applied. $p < 0.05$ was considered significant.

Results

Of the 315 eligible cases, 72% were toddlers with equal gender distribution, 58% had normal BMI, and 77% were previously healthy. Poison substances were pharmaceutical drugs (63%) versus chemical products (37%). The main exposure route was oral (98%). Home remedy was observed in 21.9% of cases, which were fluids, solutes, and/or gag-induced vomiting. Almost 52% arrived at the center after more than 1 h. Triage levels were non-urgent cases (58%), less urgent (11%), urgent (18%), emergency (12%), and resuscitative (1%). The admission rate was 20.6% and the average LOS was 13-22 hours. After adjusting and controlling for confounders, older children (odds ratio 1.19) and more critical triage levels (odds ratio 1.35) were significantly associated with higher admission rates compared with younger children ($p = 0.006$) and less critical triage levels ($p = 0.042$), respectively. Home remedy prior to arrival was significantly associated with higher average LOS ($\beta = 9.48$, $t = 2.99$) compared with those who directly visited the center ($p = 0.003$).

Conclusion

Hospital administrators are cautioned that acutely poisoned children who received home remedies prior to arrival are more likely to endure an extended LOS. This non-conventional practice is not recommended.

Emergency department handovers: a Delphi study

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Background

Emergency physicians' end-of-shift handovers typically include handover of individual patients, but could also include waiting times and hospital crowding, among other factors. Generic handover tools like SBAR or I-PASS exist but have not been widely adopted by physicians. A standardized handover framework specific to the setting does not exist and the process remains prone to significant individual variations. We conducted a qualitative study on a panel of emergency physicians to form a consensus on a general framework for emergency department end-of-shift handovers. This was part of a departmental handover improvement project.

Methods

The study used an electronic Delphi method. The panel consisted of ten board-certified emergency physicians who remained anonymous throughout the study. The Delphi process had four rounds. The first round solicited itemized lists of all information that panel members considered relevant for an end-of-shift handover. In rounds 2 to 4, panel members were given the chance to score items (1 to 10) on how frequently they would be important in a given handover, and then compare their scores with group averages and place arguments to influence other members' scores.

Results

A total of 42 items were identified by the panel. These items fell under five domains: patient identifiers, clinical assessment, course in the department, departmental status, and miscellaneous items. The mean score was 7.94 out of 10. Of the 42 items, 27 scored ≥ 8 , and 10 scored ≥ 9 . Only three items had a score of 10, and 13 scored ≤ 7 .

Conclusion

To our knowledge, this is the first Delphi-style study on emergency medicine handovers. The resulting list of scored items provided much-needed clarity and served as a guide to the design of a departmental electronic handover tool. Similar work on a larger scale could help garner national or international consensus and establish best practice guidelines.

The effectiveness of BLS workshops on the long-term knowledge retention of second-year medical students in King Saud bin Abdulaziz University for Health Sciences

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Background

Sudden cardiac arrest accounts for approximately 15% of total mortality in the USA. Immediate basic life support (BLS) can save the victim and improve outcomes. Introducing BLS training to university students has been highly recommended to increase their awareness and community awareness of BLS. We aim to evaluate the effectiveness of BLS training workshops on the knowledge and long-term retention of BLS essentials in undergraduate medical students.

Methods

A pre-post, quasi-experimental study was conducted from 2015 to 2016 among undergraduate second-year (n=62) and third-year (n=54) female medical students at the College of Medicine, King Saud bin Abdulaziz University for Health Science, Riyadh, Saudi Arabia. We provided a BLS workshop and evaluated the students' knowledge three times using a written test before the workshop (pre-test), immediately after the workshop (post-test 1), and 3 months later (post-test 2) to evaluate long-term retention.

Results

A total of 116 students participated in the study. A significant difference was found between second- and third-year students in the pre-test knowledge mean score (9.07 ± 2.99 versus 12.65 ± 3.91 , $p < 0.001$). However, there was no significant difference between second- and third-year students in post-test 1 score (20.22 ± 2.90 versus 19.46 ± 2.98 , $p > 0.05$) and post-test 2 score (16.56 ± 3.55 versus 17.38 ± 3.07 , $p > 0.05$). Second-year students' long-term retention of knowledge differed significantly to their result immediately after the workshop (20.22 ± 2.90 versus 16.56 ± 3.55 , $p < 0.001$).

Conclusion

Although the third-year medical students showed superiority in their knowledge before the workshop, there is no significant difference between the second- and third-year students in both post-tests, indicating similar retention of knowledge. Therefore, we recommend standard BLS training to be a part of the second-year medical curriculum.

Nurses' perceptions of safety climate and barriers to reporting medication errors

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Background

Patient safety issues, including safety climate and medication safety, are central concerns for the nursing profession and part of a nurse's job responsibility. Creating an environment conducive to reporting errors requires a relation to a systems approach to patient safety and safety climate. Therefore, this study aimed to assess nurses' perceptions of safety climate and barriers to reporting medication errors.

Methods

The study was conducted at all inpatient medical and surgical care units at Alexandria Main University Hospital, Egypt. A random sample of 204 (50%) staff nurses working in these units were included. The Safety Climate Scale (SCS) was used to measure nurses' perceptions of safety climate. The Barriers to Reporting Medication Administration Errors Questionnaire (BRMAE-Q) was used to measure nurses' perceptions of barriers to reporting medication errors.

Results

Nurses perceived high safety climate in their units and perceived that the most important barriers preventing them from reporting medication errors were "disagreement over what is medication error and its definition, and power distance", while reporting effort was the least important barrier to reporting medication errors. Also, there was a positive significant correlation between nurses' perceptions of overall safety climate and perceived barriers to reporting medication errors.

Conclusion

Nurses might perceive that safe work climate could be related to their non-reporting of medication errors. Continuous in-service educational programs on quality and safety including safe work environment and safety climate as well as a blame-free culture for reporting errors are recommended.

Laboratory results for chemotherapy-oncology patients in KASCH

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Background

As part of the laboratory department's continuous efforts to improve processes and services for patients, an agreement was made between the laboratory and oncology departments in King Abdullah Specialized Children's Hospital (KASCH) with the following objectives: to provide patient comfort physically and financially by unifying the patient's clinic and laboratory appointments to be on the same day; to reduce chemotherapy patient waiting time; to improve turnaround time (TAT) for chemotherapy patients up to 40 minutes.

Methods

Starting in February 2016, a new laboratory panel was created for chemotherapy patients in the Best Care system and was only authorized to oncology physicians. Guidelines and proper training were given to physicians. The purpose of the panel was to identify the chemotherapy patients for laboratory staff; to maintain cost efficiency by ordering only the needed tests for chemotherapy patients before infusion; and to provide easier data collection and analysis. Patient data were collected and analyzed on a daily basis; survey questionnaires were applied in the infusion unit in order to measure patient satisfaction with the new process.

Results

Results showed that 75% of patients preferred to do laboratory tests and take chemotherapy on the same day. The overall performance of laboratory divisions was excellent (81% for chemistry, 93% for hematology). In addition, the overall TAT in KASCH laboratory was significantly improved during the project. Waiting time was around 10 minutes and improvements will be made in the waiting area by installing the electronic numbering system. TAT of chemistry will be improved by changing the type of chemistry tube from serum separator tube, which needs 10 minutes of clotting time, to rapid serum tube, which needs only 5 minutes of clotting time.

Conclusion

As a result of this project, this panel will be fixed for chemotherapy patient screening.

Warfarin treatment and rate of hospitalization in heart valve surgery patients

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Background

Patients with prosthetic mechanical heart valves need lifelong anticoagulation. Current European and American guidelines recommend the use of warfarin only. Warfarin is, however, associated with a high risk of anticoagulation-related events necessitating frequent monitoring to maintain international normalized ratio (INR) within a narrow therapeutic range. The aim of this study was to determine the frequency of hospital admissions in patients on lifelong warfarin therapy post-heart valve replacement.

Methods

This was a cross-sectional study in patients attending the prosthetic valve anticoagulation clinic between 2010 and 2015. All admissions were recorded from electronic patient records. Data including demographics, comorbidities, interacting drugs, and type of valve replacement were collected. Results were expressed as mean \pm SD for continuous data and percentages (%) for categorical data. Differences between means were analysed using the Wilcoxon rank sum test for continuous data and the chi-squared test for categorical data. Odds ratio (OR) and 95% confidence intervals (CI) are presented; $p < 0.05$ is considered significant. Data analysis was performed using JMP (SAS for Windows).

Results

During the study period, 180 patients on warfarin were admitted. The mean age was 57 ± 14 years and 54% were female. Comorbidities included atrial fibrillation (61%), hypertension (52%), diabetes (48%), and coronary artery disease (21%). 39% of patients had anemia, with a history of gastrointestinal bleeding in 7.8% of this group. Only 6% smoked in this cohort. Regarding interacting drugs, 3.4% of patients were on amiodarone, 2.8% on NSAIDs, 9% on corticosteroids, and 23.6% on antiplatelets. The total number of admissions was 442, with 24% of those directly related to warfarin; warfarin toxicity (4%), acute thrombotic events, all ischemic strokes (11%), bleeding (21%), supratherapeutic INR (33%), subtherapeutic INR (19%), 10% for INR adjustment before surgery, and 2% with anemia. The warfarin-related admission rate was significantly higher in younger patients (OR 1.5, 95% CI 1.1-2), patients on concomitant antiplatelet therapy (OR 1.9, 95% CI 1.1-3.2), and patients with a diagnosis of anemia (OR 1.7, 95% CI 1.1-2.7). There was also a non-significant but higher number of admissions on concomitant steroids (OR 1.5, 95% CI 0.73-3.1).

Conclusion

The warfarin-related admission rate is higher in younger patients, in those on concomitant antiplatelets, and possibly in those on corticosteroid therapy. Despite strict and frequent anticoagulation monitoring, anticoagulation-related events still result in hospitalizations, with implications for morbidity and mortality as well as healthcare costs.

Laboratory results for chemotherapy-oncology patients in KASCH

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Background

As part of the laboratory department's continuous efforts to improve processes and services for patients, an agreement was made between the laboratory and oncology departments in King Abdullah Specialized Children's Hospital (KASCH) with the following objectives: to provide patient comfort physically and financially by unifying the patient's clinic and laboratory appointments to be on the same day; to reduce chemotherapy patient waiting time; to improve turnaround time (TAT) for chemotherapy patients up to 40 minutes.

Methods

Starting in February 2016, a new laboratory panel was created for chemotherapy patients in the Best Care system and was only authorized to oncology physicians. Guidelines and proper training were given to physicians. The purpose of the panel was to identify the chemotherapy patients for laboratory staff; to maintain cost efficiency by ordering only the needed tests for chemotherapy patients before infusion; and to provide easier data collection and analysis. Patient data were collected and analyzed on a daily basis; survey questionnaires were applied in the infusion unit in order to measure patient satisfaction with the new process.

Results

Results showed that 75% of patients preferred to do laboratory tests and take chemotherapy on the same day. The overall performance of laboratory divisions was excellent (81% for chemistry, 93% for hematology). In addition, the overall TAT in KASCH laboratory was significantly improved during the project. Waiting time was around 10 minutes and improvements will be made in the waiting area by installing the electronic numbering system. TAT of chemistry will be improved by changing the type of chemistry tube from serum separator tube, which needs 10 minutes of clotting time, to rapid serum tube, which needs only 5 minutes of clotting time.

Conclusion

As a result of this project, this panel will be fixed for chemotherapy patient screening.

Warfarin treatment and rate of hospitalization in heart valve surgery patients

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Background

Patients with prosthetic mechanical heart valves need lifelong anticoagulation. Current European and American guidelines recommend the use of warfarin only. Warfarin is, however, associated with a high risk of anticoagulation-related events necessitating frequent monitoring to maintain international normalized ratio (INR) within a narrow therapeutic range. The aim of this study was to determine the frequency of hospital admissions in patients on lifelong warfarin therapy post-heart valve replacement.

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Results

During the study period, 180 patients on warfarin were admitted. The mean age was 57 ± 14 years and 54% were female. Comorbidities included atrial fibrillation (61%), hypertension (52%), diabetes (48%), and coronary artery disease (21%). 39% of patients had anemia, with a history of gastrointestinal bleeding in 7.8% of this group. Only 6% smoked in this cohort. Regarding interacting drugs, 3.4% of patients were on amiodarone, 2.8% on NSAIDs, 9% on corticosteroids, and 23.6% on antiplatelets. The total number of admissions was 442, with 24% of those directly related to warfarin; warfarin toxicity (4%), acute thrombotic events, all ischemic strokes (11%), bleeding (21%), supratherapeutic INR (33%), subtherapeutic INR (19%), 10% for INR adjustment before surgery, and 2% with anemia. The warfarin-related admission rate was significantly higher in younger patients (OR 1.5, 95% CI 1.1-2), patients on concomitant antiplatelet therapy (OR 1.9, 95% CI 1.1-3.2), and patients with a diagnosis of anemia (OR 1.7, 95% CI 1.1-2.7). There was also a non-significant but higher number of admissions on concomitant steroids (OR 1.5, 95% CI 0.73-3.1).

Conclusion

The warfarin-related admission rate is higher in younger patients, in those on concomitant antiplatelets, and possibly in those on corticosteroid therapy. Despite strict and frequent anticoagulation monitoring, anticoagulation-related events still result in hospitalizations, with implications for morbidity and mortality as well as healthcare costs.

Awareness of ICU staff of patient safety and increase in safety reporting

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Background

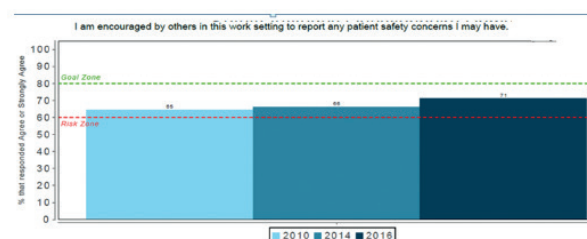
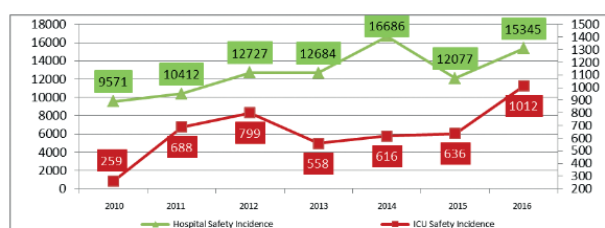
Incident reporting is an important tool to improve patient safety. Improving safety culture, increasing intensive care unit (ICU) staff awareness about incident reporting, and involving ICU staff in incident management are considered key factors in reporting practice.

Methods

An ICU multidisciplinary committee analyzed ICU incidents and provided timely feedback to frontline staff. Awareness about incident reporting and its significance was performed through interactive presentations by ICU staff about lessons learned from reported incidents during the weekly Critical Care Safety Forum. Examples of discussed incidents in 2016 included defects in respiratory management and central-line placement, medication errors, blood transfusion to a wrong patient, and incomplete documentation in Best Care. The ICU staff were also involved in investigating certain incidents and finding solutions. To examine the effect of these interventions, we evaluated the numbers of electronically submitted patient safety incidents (SRSs) that occurred between 2010 and 2016 in the ICUs at King Abdulaziz Medical City–Riyadh and we compared the trends with the numbers in the rest of the hospital. We also evaluated the changes in the Safety Culture Survey between 2010 and 2016.

Results

Between 2010 and 2016, patient safety incidents in the adult ICUs increased by 391% with the steepest increase in 2016 compared with 2015 (+59%). In the hospital, incident reporting increased by 60% between 2010 and 2016 and by 27% between 2015 and 2016.



These changes were associated with an increase in Safety Culture Survey reporting-related scores between 2014 and 2016. Specifically, there was a 5% increase in the item "I am encouraged by others in this work setting to report any patient safety concerns I may have".

Conclusion

Increasing the awareness of ICU staff about incident reporting and involving them in related quality improvement projects resulted in higher incident reports, likely through improved safety culture.

Post-CABG SSI decrease in KFCC through multidisciplinary and multilevel interventions

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Background

Surgical site infections (SSIs) represent a significant patient safety concern and can cause severe morbidity in post-surgery patients. The reported SSI rate after coronary artery bypass grafting (CABG) was 23% in Q4 of 2015, which is above the international benchmark of 2.9 and 3.3 SSIs per 100 operations. To address this issue, the infection prevention and control department, quality and patient safety department, nursing services, and cardiac surgical staff were assembled to determine parameters and measurable elements with applied improvement methodology, aimed to reduce the occurrence of SSI post-CABG.

Methods

This prospective interventional study was conducted at the beginning of 2016 using IHI rapid improvement methodology (plan, do, check, and act). The intervention began in Q2 2016 when a multidisciplinary team was assembled. Data from all CABG process interventional stages (pre-, intra-, and post-operative) were collected and analyzed using a fishbone diagram to identify factors and gaps in SSI development processes. Effective infection control strategies were applied in all surgical process stages, and failure mode and effect analysis conducted. Corrective action was accomplished and a contingency plan prepared. After the implementation of multidisciplinary and multilevel interventions, SSI cases were followed-up for 3 months for the primary site and 1 month for the donor site including implementation of appropriate antimicrobial prophylaxis and surgical bundle compliance checklists. Continued surveillance of SSIs and reports were shared to all hospital staff.

Results

The rate of post-CABG SSIs pre-intervention in Q1 2016 was 26% (six of 23). Significant improvement was observed following the intervention in Q2 with a rate of post-CABG SSIs of 5% (two of 37), which subsequently reached 0% (none of eight) by Q3 of 2016. There is significant compliance, reaching 100% for the surgical bundle at different process intervention levels.

Conclusion

By implementing peri-operative interventions and process modifications, a significant reduction in post-CABG SSIs was achieved, patient safety has improved, and the hospital conserved valuable resources such as money, supplies, and time. Further control monitoring of the process is required.

Effectiveness of multiple initiatives in optimizing blood product utilization applying Lean six sigma methodology at King Abdulaziz Medical City-Jeddah (KAMC-JD)

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Background

Blood products are life-saving components. In our institution, increased patient population and demand for blood components have resulted in increased numbers of blood transfusions. Blood component wastage and a low number of donations have resulted in a reduction in the number of blood components per request. Providing suboptimal dosage of blood components can affect patient safety. Improving utilization of blood components became an organizational priority with an aim to reduce wastage by 50% to reach international best practice.

Methods

This study was conducted in the operating room, emergency department, intensive care units, cardiac center, and oncology department. All blood components wasted from January to December 2016 were included; the intervention began in July 2016. The define, measure, analysis, improve, and control (DMAIC) framework was used. Data were gathered retrospectively and included blood component wastage, blood component orders reduced due to "no inventory", and donations. Wastages were caused by improper handling or ordered components not being transfused. Gemba walk and ESCAPE analysis were used to accelerate and streamline the processes, including blood thawing practice. Cause and effect analysis resulted in review and clarification of the blood transport procedure. Educational sessions were conducted in all clinical departments. The community was engaged through increasing awareness of blood donation campaigns.

Results

Pre-intervention, 15,258 blood components were ordered, 12.52% red blood cells (RBCs; 173/1380) and 5.39% platelets (111/2059) orders reduced due to "no inventory". Wastage of dispensed component was 2.04% (n=181), cost 207,350 SR. Post-intervention demand increased by 58%, 24,070 blood components ordered. Orders reduced decreased to 0.60% (10/1666) RBCs and 0.96% (12/1246) platelets. Wastage was significantly reduced to 0.88% (n=121; p=0.000) and cost was reduced by 32% to 141,200 SR by the end of December 2016.

Conclusion

Lean six sigma methodology was used to streamline internal processes. Our results show that appropriate and timely interventions can significantly reduce blood wastage, saving cost and resources, reaching the goal within 4 months. Further evaluation and control measures are required to attain optimal transfused-cross matched ratio.

Enhancing the timely response of physicians to critical laboratory values

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Background

We identified a delay in the response of physicians to critical laboratory values, which poses a risk to patients' health. Therefore, we implemented a program to improve physicians' time to respond (TTR) to critical laboratory value notification to less than 45 minutes as required by hospital policy.

Methods

A multidisciplinary team performed process mapping to identify reasons for delay in response and to determine possible interventions. Repeated PDSA (plan, do, study, act) cycles were conducted exploring different methods of communication and monitoring TTR. All change requirements were implemented in the work process. All the communication possibilities were researched and closely studied, including:

- Communication via email, communication via SMS, communication through mobile phone, and communication through paging system.
- Dedicated pager/bleeper was provided to one physician taking care of the critical laboratory values in each section.
- All beepers/pagers were written clearly in the on-call roster for each section on a monthly basis.
- The on-call physician list was shared with the laboratory/pathology department for easy access to communicate.
- Escalation of paging to chairman/operations administrator leading to direct phone calls to the divisional leadership and the on-call physician taking care of all the critical care results (7 minutes to escalate from first level to second level).

Results

Physician TTR was decreased from an average of 8.9 hours to 8.4 minutes between March 2015 and September 2015 and maintained through to December 2016. The TTR was maintained at less than 8.4 minutes up to the time of reporting, which reflects a good sustainability plan.

Conclusion

Our project revealed a sustained impact on TTR as a result of multidisciplinary teamwork to improve the communication process.

Characteristics of adverse drug reactions (ADR) reported at KAMC-Jeddah

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Background

Despite the improvement in healthcare practice and reporting systems for detection and prevention of adverse drug reactions (ADRs), they continue to be one of the top ten leading causes of death, illness, and increased healthcare cost. King Abdulaziz Medical City-Jeddah (KAMC-J) recently moved from a paper-based to an electronic spontaneous safety reporting system (SRS), which is considered to be one of the most common methods used in pharmacovigilance. Data on ADRs characteristic to our patient population are lacking. We aimed to determine the characteristics of ADRs since SRS implementation (2014-2016).

Methods

This was a retrospective cohort study of ADR reports. ADR causality was assessed using the Naranjo scale, severity using the Hartwig Siegel scale, and preventability using the Schumock and Thornton scale.

Results

A total of 330 ADR reports were received and reviewed over 3 years. The highest ADR rates were among adults (67%; age >18 to <65 years) followed by children (38%; birth to 18 years) then geriatrics (12%; age >65 years). Most ADRs (50%) were type B reactions resulting in prolonged hospitalization and nearly 40% were type A in nature resulting in hospital admission. The majority of ADRs (60%) were given a severity scale level of 3 to 4. About 52% of ADRs were probable causality and 40% were probably preventable. Six drug groups were associated with nearly 70% of all drug-related hospital admissions or prolonged hospitalization. The top three were chemotherapy (41%), antimicrobials (24%), and contrast dyes (5%). The most frequently reported symptoms were dermatological (80%). The majority (95%) of ADRs improved at the time the report was raised.

Conclusion

Many of the ADR symptoms were relatively mild and improved once the dose was reduced or the drug changed or stopped, but other ADRs were more serious. Further work is needed to analyze underreporting and staff awareness and to confirm the risk factors associated with ADRs.

Achieving patient safety through quality improvement projects

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Background

Liver transplant entails the replacement of a failing liver with a healthy liver from either a live or deceased donor. The evaluation process of both the recipient and live liver donor is rigorous and complex, and involves multiple specialties and multiple complex investigational tools.

Methods

The target is a 5-day evaluation period for the recipient. The project scope is to review the current patient pathway from referral for live donors and for patients receiving transplants from cadavers until making the decision for surgery. Data collection enabled us to create and analyze baseline data, and enabled us to acknowledge the current status of the process and identify areas for improvement. The transplant quality team supported the data collection process. The patient pathway has been reviewed, and the initial data have been analyzed. We reviewed a sample of patient charts. This enabled a detailed analysis of the last patients to complete the pathway to evaluate the periods of time taken to complete specific pathway milestones. Upon completion of the review of patient charts and data analysis, a meeting was arranged with stakeholder representatives and the transplant chairman (process owner) to discuss the findings and identify specific solutions for pathway improvement. Actions by stakeholder services were identified, implemented, reviewed, and analyzed to identify improvements made. This process followed the plan-do-study-act cycle for improvement.

Results

Since the process was implemented, the aim was met throughout the whole of 2015, with the exception of one special case and for the 2 months in which the hospital was closed because of an outbreak of Middle East respiratory syndrome coronavirus. For 2016 the aim was met (5 days) for most of the year, with little deviation since the move to KASCH needed further adjustment.

Conclusion

The use of process improvement principles in the recipient transplant evaluation process has minimized a lengthy work-up into a 5-day evaluation process in order to optimize patient care and safety. The 5-day target was met in 2015 and 2016 and sustained.

Shortening the donor evaluation process using process improvement principles

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Background

Liver transplant has emerged as a durable and curative therapy for endstage liver disease. In recent years, because of the shortage of cadaveric organs, living organ donation has assumed primary relevance. Organ donation mandates extreme patient safety precautions because any lapses in care can tarnish the image of the transplant program with lasting adverse impacts on employee morale. The overarching aim of this project was to evaluate the effectiveness of our quality management project focused at ensuring living organ donor safety.

Methods

We performed a retrospective review of the efficacy of our living donor evaluation process. Using Microsoft Excel, the data were collected for all living liver donors from 2013 to 2015. This time point was selected to reflect a major quality management initiative launched in 2013. Duration of donor evaluation was expressed in number of days and calculated from initial referral to the completion of the diagnostic work-up and presentation to the selection committee. To determine the actuarial trend, separate analyses were done for each year. Statistical analyses were performed in Microsoft Excel.

Results

Data for all 76 patients were analyzed in this project. The mean age at study enrolment was 42.9 years (range 19-50); 67 (88.1%) of donors were male. Expressed as number days to complete the donor evaluation, a declining trend was seen over time (2013, mean 54 days [6-258]; 2014, mean 49 days [3-150]; 2015, mean 27 days [6-63]).

Conclusion

Our quality initiative has been quite instrumental in delineating trends towards prompt donor evaluation, provider engagement and satisfaction, and resource utilization. These data have also prompted us to undertake additional inter-nodal assessment to determine and rectify the potential causes of wide variation between patients completing the work-up. This will be the focus of our follow-up project.

Improving boarding time for patients in the emergency department (ED)

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Background

Delays in moving patients from the emergency department (ED) to oncology wards may result in patient boarding in the ED, which may expose patients to risk of infection and delays in delivering proper treatment. Our project aimed to reduce the time of boarding in the ED to less than 6 hours, as set by the organization's leadership.

Methods

A multidisciplinary team critically reviewed the patient intake process from the ED to various oncology wards at the new facility. Process mapping was done to identify areas of improvement, including initial assessment of patients in the ED, accepting the patient into oncology care, assigning a bed in the relevant oncology ward, and transferring the patient to the assigned bed. Several simulations and scenario-based studies were conducted to foresee all the possibilities that might be encountered while transferring care and transferring patients. Daily consultant rounds were scheduled to start before 9:00 am. A daily bed management meeting was scheduled every morning to discuss various aspects of patient flow.

Results

Medical and operational decisions were made in a timely fashion with better communication among the staff and patients and their families. Better communication between the department of oncology, ED, and bed management department was established on a daily basis. Patient waiting time in the ED was reduced from 22 hours (Apr-Sep 2016) to 12.4 hours (Oct-Dec 2016). During the same period, the average length of stay was reduced from 29 days to 13 days. Adherence to daily rounds before 9:00 am was 77% and to the daily morning bed management meeting was 91%.

Conclusion

Our project showed that improved communication among involved departments, centralized decision making based on different oncology specialty criteria, and forming a detailed algorithm reduced the ED boarding time of patients and shortened length of stay by improving discharge planning.

Chasing zero: winning the war against blindness

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Background

The increased survival of extremely low birthweight infants over the past decades has led to increased incidence of blindness due to retinopathy of prematurity (ROP). Worldwide, almost 20,000 infants each year become severely visually impaired or blind from ROP. About 400-600 infants each year in the USA become legally blind from ROP. The aim of our auditing study is to identify the incidence and severity of ROP, and the number of cases with retinal detachment and/or blindness after implementing a multidisciplinary program for prevention of ROP.

Methods

This is a retrospective chart review audit of preterm infants of less than 33 weeks' gestation who are admitted in KAMC Neonatal Intensive Care Department after implementation of a structured program to prevent ROP. This program includes oxygen blenders and pulse oximeters in the resuscitation room, setting targeted oxygen saturation parameters for all preterm babies on oxygen, one nurse for each ventilated preterm infant, an ophthalmology specialist doing rounds once weekly for the at-risk preterm infants, and early treatment for severe ROP.

Results

581 preterm infants were admitted to our neonatal intensive care unit at King Abdulaziz Medical city, Riyadh, between 1 January 2010 and 31 December 2014, with a mean birthweight of 1118 g and a mean gestational age of 28.8 weeks. ROP was diagnosed in 38.5% (224/581), and only 3.6% (21/581) infants developed severe ROP. Three infants were treated by LASER and 17 were treated with anti-VEGF (ranibizumab) injection. No cases developed retinal detachment or blindness.

Conclusion

Implementing a multidisciplinary program including nursing, neonatology, and ophthalmology can prevent retinal detachment and blindness from ROP in high-risk preterm infants.

Decreasing fractures in high-risk neonates in a tertiary NICU

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Background

Metabolic bone disease (MBD) of prematurity is seen mainly in infants born before 28 weeks of gestation. These infants are at high risk for osteopenia of prematurity, which leads to fractures, with a reported incidence of fractures varying from 1.2% to 10.5%. We had several safety reports of fractures in the last quarter of 2015. Therefore, a multidisciplinary quality improvement project was initiated. The aim of this project is to assess the efficacy of this approach in decreasing fracture occurrence within this high-risk group.

Methods

In this retrospective auditing report, all high-risk infants who were admitted to NICD KAMC-RD were divided into two groups; the first group (A) before the intervention (October 2015 to June 2016) and the second group (B) after the intervention (July 2016 to January 2017). Inclusion criteria were birthweight less than 1000 g, gestational age less than 28 weeks, total parenteral nutrition more than 1 month, cholestasis more than 2 weeks, surgical NEC, steroid or loop diuretics more than 2 weeks. The multidisciplinary team included neonatologists, dieticians, physiotherapist, clinical pharmacist, endocrinologists, and nursing staff. The intervention consisted of a panel of blood tests, education of all healthcare workers about MBD, and unit-based competency for nurses handling the high-risk patients to improve nutritional intake and proper handling of those infants.

Results

A total of 121 infants were enrolled during the audit period. Eight (12.5%) of 65 infants in group A had a total of 18 fractures. Only one (1.5%) of 56 infants in group B developed six fractures.

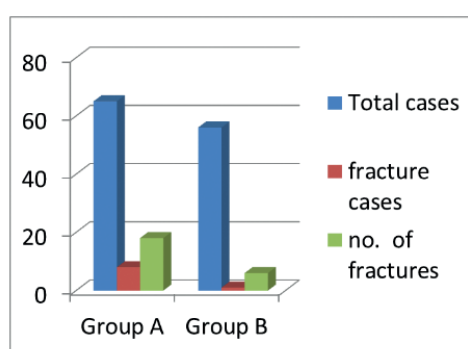


Figure 1: Comparison of results before (group A) and after (group B) the intervention

Conclusion

Implementing a structured program focusing on education, nutritional intake, and improving proper handling of high-risk infants decreased the incidence of infants with fractures from 12.5% to 1.5%.

Caring for the carer: a cross-sectional study of the overall emotional functioning of healthcare providers in Saudi Arabia

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Background

Healthcare professionals work long hours, have demanding patient loads, and make important decisions under conditions of uncertainty. These conditions have been shown to be associated with negative emotional and psychological outcomes for healthcare professionals. They have also been shown to lead to anxiety, depression, and other psychological and interpersonal strains, and ultimately compromise the quality of patient care. The aim of this study is to evaluate the mental health issues of healthcare providers including anxiety, depression, behavioral control, positive affect, and general distress.

Methods

This is a cross-sectional study using a self-administered survey. The questionnaire was distributed to healthcare providers working in governmental and private health sectors in Saudi Arabia during January to April 2016. The questionnaire included a demographic survey and the Mental Health Inventory. 45 (45%) staff completed the package. Data was entered into SPSS database and descriptive inferential statistics were employed as appropriate.

Results

Healthcare professionals scored higher within the psychological distress, anxiety, depression, and loss of behavioral emotional control domain, indicating greater psychological distress. The results showed that female participants scored higher on the depression domain than male participants ($p=0.01$). Also, physicians scored higher on the general positive affect domain than other healthcare providers ($p=0.01$). Non-Saudi healthcare providers scored higher on the psychological distress scale than Saudi participants ($p=0.0001$). Multiple regression analysis indicated that general positive affect, emotional ties, and life satisfaction are predictors of psychological well-being (98%); on the other hand, anxiety, depression, and loss of behavioral/emotional control are predictors of psychological distress (99%).

Conclusion

High psychological distress may be a consequence of the stressors associated with high work demands, workload, staff shortage, fear of infection, licensing board, fear of losing job, and fear of reaction from leadership, peers, patients, and their families. Organizational supportive programs should be developed to enhance the psychological well-being of healthcare professionals.

