Contra Costa
Regional Medical Center
& Health Centers
A Division of Contra Costa Health Services

To:	Joint Conference Committee Members	Date:	May 2, 2022
From:	Supervisor John Gioia – District I Supervisor Diane Burgis – District III	Subject:	Meeting Notice Joint Conference Committee
By:	Samir Shah MD, Chief Executive Officer Contra Costa Regional Medical Center		

Due to the Shelter-in-Place Order, this meeting will not be held in person. You can access the meeting remotely by using the information on page 3 of this agenda.

JOINT CONFERENCE COMMITTEE

VIA ZOOM WEBINAR-Instructions on Page Three of This Agenda

AGENDA

May 2, 2022, from 1:00 – 2:00 pm

AGENDA ITEM	RECOMMENDATION
I. **CALL TO ORDER and INTRODUCTIONS** Meeting Chair- Supervisor John Gioia, District I	Inform
II. **APPROVAL OF MINUTES** – March 7, 2022 Supervisor Gioia	Inform/Action
III. **PUBLIC COMMENT** Supervisor Gioia *At this time, members of the public may comment on any item not appearing on the agenda. It is recommended that you keep your comments to two minutes or less. Under State law, matters presented under this item cannot be discussed or acted upon by the Board at this time. For items appearing on the agenda, the public will be invited to make comments at the time the item comes up for Board consideration.*	Inform
V. **ADMINISTRATIVE UPDATE** Samir B. Shah, MD, Chief Executive Officer/Chief Medical Officer A. Covid Update Sergio Urcuyo, M.D., Hospital Medical Director B. Measure X C. Appointment Unit Update D. QIP Update Nooshin Abtahi, QIP Lead	Inform

AGENDA ITEM	RECOMMENDATION
VI. **MEDICAL STAFF UPDATE** Kristin Moeller, M.D., Medical Staff President A. Patient Care Policies for CCRMC/HCs, includes - Policies, MEC approved, postponed from March 7 meeting (Attachment A) - Policies, MEC approved for May 2 meeting (Attachment B)	Inform/Consent
VII. **SAFETY AND QUALITY UPDATES** Courtney Beach, M.D., Chief, Hospital Medicine A. PSPIC/Quality Update B. Annual Medical Error Reduction Plan Shideh Ataii, Director, Pharmacy Services	Inform Inform/Consent
VIII. **ADJOURN**	Inform
IX. **NEXT MEETING**: Monday, June 27, 2022	

Joint Conference Committee observes Ralph M. Brown Act open meeting law procedures. Reasonable accommodations will be provided for persons with disabilities planning to attend. Contact the staff person listed below at least 72 hours before the meeting. Any disclosable public records related to an open session item on a regular meeting agenda and distributed by the County to a majority of members of the Joint Conference Committee prior to that meeting are available for public inspection at 2500 Alhambra Avenue during normal business hours. Public comment may also be submitted via electronic mail at least one full workday prior to the published meeting time. For information contact Karin Stryker – karin.stryker@cchealth.org, 925-234-1909.

Zoom Webinar

Meeting Instructions

Please click the link below to join the webinar:

https://cccounty-us.zoom.us/j/81374486051?pwd=eFBWTXVFcUNlcTBFUjdoMWFtWVNIZz09
Passcode: 694471

Or Telephone:

Dial:

USA 214 765 0478 US Toll

USA 888 278 0254 US Toll-free

Conference code: 154228

Or an H.323/SIP room system:

H.323: 162.255.37.11 (US West) or 162.255.36.11 (US East)

Meeting ID: 813 7448 6051

Passcode: 694471

SIP: 81374486051@zoomcrc.com

Passcode: 694471

Contra Costa
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JOINT CONFERENCE COMMITTEE

MINUTES

March 7, 2022, from 1:00 – 2:00 pm

Due to the Shelter-in-Place Order, this meeting will not be held in person.

VOTING MEMBERS PRESENT: Supervisor John Gioia, District I; Dr. Courtney Beach, Chair, Hospital Medicine; Supervisor Diane Burgis, District 3; Katherine Goheen; Ashley Porteous NON-VOTING MEMBERS PRESENT: Samir Shah MD, Chief Executive Officer/Chief Medical Officer; Kristin Moeller MD, Medical Staff President; Anna Roth, R.N. NON-VOTING MEMBERS ABSENT: None. GUESTS PRESENT: Jaspreet Benepal RN, Chief Nursing Officer; Sergio Urcuyo MD, Hospital Medical Director; Karin Stryker, Director, Safety and Performance Improvement; David Runt, Chief Operations Officer. Helena Martey, Director of Ambulatory Care; Ira-Beda Sabio, Director of Inpatient Nursing; Gabriela Sullivan MD, Ambulatory and Specialty Medical Director; Rajiv Pramanik, Chief Medical Informatics Officer; William Walker, Director of Health Services; Nancy Hendra, Director of Infection Prevention and Control Program; Kimberly McCarl, Communications Officer; Enrique Henriquez, Chief of Security; Roberto Vargas, Director, Safety and Performance Improvement

AGENDA ITEM	RECOMMENDATION
I. **CALL TO ORDER and INTRODUCTIONS** Meeting Chair- Supervisor John Gioia, District I	***Inform***
II. **APPROVAL OF MINUTES** – December 13, 2021 Supervisor Gioia ***In open session, voting members of Contra Costa Regional Medical Center Joint Conference Committee voted to accept the December 13, 2021, Joint Conference Committee minutes***	***Motion:*** ***By Moeller*** ***Seconded by Gioia*** ***Ayes:*** ***Burgis, Goheen, Porteous*** ***Absent: None*** ***Abstain: None***
III. **PUBLIC COMMENT** Supervisor Gioia ***No public comment***	***Inform***
IV. GOVERNANCE Kristin Moeller, M.D., Medical Staff President **A.** Governing Authority Bylaws Draft ***The 2022 governing bylaws were presented after County Council review. The primary change was adding the CNO as a non-voting member of JCC. The bylaws were approved as presented.*** **B.** Announce Medical Staff Representatives to the Joint Conference Committee for 2022 – Dr. Katherine Goheen and Dr. Ashley Porteous	***Inform***

Dr. Ashley Porteous and Dr. Katherine Goheen were presented as the medical staff representatives for the current period. Dr. Courtney Beach and Dr. Andrea Sandler were thanked for their service in 2020 and 2021.	
AGENDA ITEM	**RECOMMENDATION**
V. ADMINISTRATIVE UPDATE Samir B. Shah, MD, Chief Executive Officer/Chief Medical Officer A. Measure X ***Dr. Shah noted that the Measure X-related construction projects were approved by the Board of Supervisors earlier this year. Public Works is currently assisting CCRMC in its search for a construction management firm through a Request for Qualifications. Six qualified companies have been evaluated to date. It was noted that these Measure X projects include PES expansion, an Interventional Radiology suite, a new Medical Clinic Office building, and a Parking Structure.*** B. Covid Update ***CCRMC continues to experience lower Covid admissions, which trends with the regional and state data. There are still some staff experiencing illness. We are moving away from emergency management mode to chronic management with known triggers. We will have a clearly laid out plan that works to normalize COVID into our standard workflows.*** C. Materials Management Value Stream Map event ***Dr. Shah announced that CCRMC was undergoing a Value Stream Mapping event in our Materials Management department. CCRMC has had significant and continuous issues with materials, procurement, vendor payment, order assembly, and interactions with the various departments involved with the purchasing or contracting process. A series of rapid improvement events will be held very soon after the mapping concludes this week.***	***Inform***
VI. MEDICAL STAFF UPDATE Kristin Moeller, M.D., Medical Staff President A. Patient Care Policies for CCRMC/HCs ***Supervisor Gioia reported that when he cut and pasted the link provided on the agenda, it did not allow access to the policies. Karin Stryker will send the policies with the agenda for following meetings. These policies presented today will be moved to the May 2022 meeting for inform and consent.***	***Inform/Consent***
VII. SAFETY AND QUALITY UPDATES Courtney Beach M.D., Hospital Medical Director A. PSPIC/Quality Update ***Dr. Beach noted the following successes:*** • ***HCAHPS scores for hospital cleanliness are higher than target*** • ***Zero patient harm index for medication errors*** • ***We continue to be on target for falls prevention*** • ***Goals met for CLABSI, CAUTI, and MRSA bacteremia*** • ***Received Leapfrog grade: B*** • ***Medication error rate from March 2020 shows we continue to meet the TJC goal for 0 harm related to medication errors.***	***Inform***

Noted areas for improvement: • ***Speak up for Safety – encourages safety event (SERS) reporting. Found in past years that SERS reporting increases when we roll out the Culture of Safety surveys.*** • ***Further multidisciplinary work ongoing projects, SERS and corrective action plans. Trying to bring in additional physician involvement in all these projects*** • ***Increase education and advertising in rapid response training*** ***We are planning a Culture of Safety survey this spring. Expecting site visits by CDPH and TJC.***	
VIII. **ADJOURN to Professional Affairs Committee** ***There is no PAC meeting this time. Karin Stryker will repost a corrected agenda to reflect that there is no PAC meeting.***	***Inform***
IX. **NEXT MEETING**: Monday, May 2, 2022	
Minutes approved by Chair: Supervisor John Gioia, District I _____ _____ **Supervisor John Gioia** **Date** ***Minutes by Shanazz Ahmad***	

CONTRA COSTA
HEALTH SERVICES

Quality Incentive Program Update May 2020

Nooshin Abtahi, MHA
Health Services Administrator
QIP Lead

Quality Incentive Pool (QIP)

- New Quality Incentive Project (QIP) has been built upon prior value-based initiatives, PRIME and QIP, which ended in December 2020.
- QIP PY4 started in January 2021 and is approved by CMS for three years, PY4-6, Jan 1, 2021, to Dec 31, 2023
- We are required to have 40 quality metrics from both inpatient and outpatient settings
- The selected measures evaluate the performance of different aspects of the health care delivery system, including preventative care, acute and chronic disease management, behavioral health, maternal health, patient safety, care transition, and proper utilization

QIP Funding

- DHCS will determine the funding amount after the end of the measurement year based on the number of unduplicated managed care beneficiaries with at least one service at the public health entity

- The total allocated budget for the QIP PY4 statewide is $1.8 billion, and based on the prior allocation history; we predict the CCHS's share will be about $100 million

- We are set to realize all the allocated fund for 2021

QIP PY4 Achievements

- 2021 was a challenging year for population health improvement activities due to performance decline in 2020, frequent COVID surges, staff shortage, competing priorities, massive backlog, and patients' hesitancy to come for in-person visits
- Despite all challenges, multidisciplinary teams in CCRMC achieved notable improvement using both traditional and innovative methodologies in reaching out to the patients and delivering the required services
- Based on the unofficial, preliminary data shared by the Safety Net Institute, CCRMC was the best performing health entity in 2021
- We achieved the performance target for all 40 measures and overperformed in 18 measures

QIP PY4 Achievements

- Improved the performance rate for Child and Adolescent well Care Visits (3-21 years old) by 11.5% in the total population and 14.5% in African American population and reduced the disparity gap between the total and African American population from 10% to 6%

- Significant improvement in Diabetes Eye Exam (4.3 percentage increase), Diabetes HBA1c Control (4.8 percentage increase), and Hypertension Control (1.6 percentage increase)

- Significant increase in cancer screening services in 2021:
  - ✓ 4000 Breast Cancer Screening (2000 in 2020)
  - ✓ 6300 Cervical Cancer Screening (3300 in 2020)
  - ✓ 8000 Colorectal Cancer Screening (5400 in 2020)

Because of the significant improvement in the calendar year 2021, CCRMC started the PY5 with a strong base and is on the path to realize all the QIP PY5 funding

MERP PLAN FOR THE YEAR 2022

PRESCRIBING

- **New Processes:**
  - Pharmacy to explore using a Bayesian program within Vigilanz® to dose vancomycin based on AUC/MIC monitoring.
  - Implement new antibiotic order set, assess utilization and promote use.
  - Pharmacy to work with ccLink IT to optimize the high potency pain medication order set section with oral opiate medications to ensure safe and appropriate use.
  - Pharmacy to begin working with ccLink IT to optimize antidote orders in ccLink to promote safe, correct and effective use.

- **Continue the following:**
  - Continue all Pharmacy Monitors in ccLink and Vigilanz®: DDI checks, clinical conditions, lab monitors and reviewing therapeutic appropriateness, etc. Monitors will be optimized as needed.
  - Continue all processes under the Antimicrobial Stewardship Program (ASP).
  - Continue reviewing all order sets on a multidisciplinary note in ccLink as opportunities for improvement are identified, and work on new order sets as needed with the multidisciplinary trio team.
  - Continue reviewing external resources (ex: ISMP newsletters and self-assessments, FDA alerts, etc.), to analyze current practice at CCRMC and improve processes according to the most recent guidelines and literature.
  - Continue to optimize insulin prescribing through ongoing provider education. Continue the physician oversight process and provide physician education when needed. Continue to optimize order sets and panels involving insulin to further prevent hypoglycemic events.
  - ADC access:
    - Continue to monitor and trend medication overrides and provide feedback to the end users.
    - Continue to monitor ADC access to ensure that unauthorized personnel (i.e. upon departure or termination of employment of nursing/anesthesiology/pharmacy staff, etc.) are removed from the system upon leaving to prevent unauthorized access to medications.
  - Continue to utilize the rescue medication report as an educational tool for medical staff.
  - Multimodal pain management strategies to continue to be optimized via various means as a part of ERAS (early recovery after surgery).
  - Opioid stewardship committee to continue meeting quarterly to ensure appropriate use of opiates.

PRESCRIPTION ORDER COMMUNICATION

- **New Processes:**
  - New Process for vancomycin trough monitoring: BPA to alert nursing if a vancomycin trough is due within 2 hours of a vancomycin dose in addition to the robust process already in place.

- **Continue the following:**
  - Continue reviewing all order sets on a multidisciplinary note in ccLink as opportunities for improvement are identified, and work on new order sets as needed with the multidisciplinary trio team.
  - Continue the Transitions of Care (TC) Program to 1) Minimize medication transcribing errors upon admission and discharge with effective communication with "High Risk" patients (as defined by CCRMC) and to retail pharmacies and 2) Ensure medication understanding and adherence by educating patients.
  - Multimodal pain management strategies to continue to be optimized via various means as a part of ERAS (early recovery after surgery).
  - Opioid stewardship committee to continue meeting quarterly to ensure appropriate use of opiates through various means (i.e. order set modification, education, etc.)
  - Continue monitoring for duplications in therapy and optimize order sets/order panels as needed to ensure effective prescription order communication of PRN medications.
  - Continue to create guidelines and order-sets pertaining to COVID-19 related treatments to ensure safe and appropriate use of the medications.
  - Pharmacy to work with ccLink IT to optimize medication orders to prevent any prescription order communication errors (ex: atropine order)

PRODUCT LABELING, PACKAGING AND NOMENCLATURE

- **New Processes:**
  - Medication bins for Sulfa**SALA**zine and sulfa**DIAZINE** to be physically separated in the pharmacy in the pharmacy to prevent any medication errors. Pharmacy to also update LASA list at CCRMC to include Sulfa**SALA**zine – sulfa**DIAZINE.**

- **Continue the following:**
  - In the face of drug shortages, appropriate assessment of products available to be conducted and information relayed to the appropriate disciplines (pharmacy staff, nursing staff, medical staff, etc.). Appropriate changes to be made in the electronic health record to avoid transcribing errors, order set errors and medication order errors.
  - Pharmacy and nursing to continue assessing compliance with accurate labeling per nursing of IV solutions retrieved from Medline carts, along with MDVs expiration labeling.
  - Continue reviewing external resources to analyze current practice at CCRMC and improve processes according to the most recent guidelines and literature.
  - Continue Kit Check labeling and barcoding to optimize PAR levels of medications in anesthesia workstations in the OR and crash carts.
  - Continue barcoding upon dispensation and administration.
  - Continue to create guidelines, processes and master formulas for COVID-19 therapies (ex: remdesivir, monoclonal antibodies) to ensure safe use of these medications that when under EUA, may have labelling deficiencies.
  - Continue monitoring MDV expiration labeling.

COMPOUNDING

- **New Processes:**
  - Physical remodeling of the inpatient compounding environment to be completed.

- **Continue the following:**
  - Continue to review and assess USP 797 for adequate compliance per CCRMC policy in accordance with the CA State Board of Pharmacy.
  - Continue to review and assess USP 800 & NIOSH guidelines.
  - Continue end-product testing to assure integrity and sterility of compounding environment.
  - Continue sending samples of purchased goods from compounding pharmacies and CCRMC compounded products to a tertiary lab to assure sterility and potency via random sampling.
  - Continue usage of barcoding technology in the inpatient and outpatient IV sterile compounding environments.
  - CCRMC master formula is reviewed and updated on a routine basis.
  - Continue auditing IV room medication compounding within the monthly Pharmacy Dispensing Audit by pharmacy.
  - Continue IV admixture training for nursing staff, and extensive IV competency training for pharmacists and technicians on an annual basis.
  - Continue extensive monitoring for compounding under the CA State Board of Pharmacy requirements for annual licensure (Primary and secondary engineering controls, staff competency, air sampling, Dynalab® check for potency and endotoxins)

DISPENSING

- **New Processes:**
  - Implementation of "Dispense tracking," to allow nursing and pharmacy to track the medications from the time of verification to the unit.
  - Implement barcode scanning in the willow ambulatory environment in MIP.
  - Pediatric medications already require dual pharmacist verification in ccLink. Going forward in 2022, pharmacy will also require 2 pharmacists initials on the medication label to minimize any medication errors in this high-risk environment from pharmacy's end.

- **Continue the following:**
  - Continue monitoring all dispensing areas of Pharmacy Dept.
  - Continue monitoring the KPI report for pharmacy turn-around-time for order verification.
  - Continue reviewing external resources to analyze current practice at CCRMC and improve processes according to the most recent guidelines and literature.
  - Opioid stewardship committee to continue meeting quarterly to ensure appropriate use of opiates.
  - Continue barcode scanning of medications dispensed (IV medications since inception of EPIC, PO cart fill and first dose medications initiated in 2018).
  - Continue all processes under the Antimicrobial Stewardship Program (ASP) to validate for appropriateness.

DISTRIBUTION

- **New Processes:**
  - "Dispense tracking" to be implemented to track the medications from the time of verification to the floor.
  - Omnicell XT conversion to be completed. XT upgrade ensures patient data security, has metal locking bins (higher security for narcotics), and Omnidispensers rather than coils which will cause less jams and is more space efficient/higher capacity.
  - Receive recall data from EXP in addition to current processes (via California BOP emails, cardinal, etc.)
  - Efforts for optimization of Omnicell medication stocking to minimize unit dose cart fill volume including:
    - review of the Omnicell "Active Medication Orders without stocked items," report to determine commonly used medications to add to Omnicell
    - Weekly report to be run and sent to pharmacist for assessment of loading medications into unit Omnicell, depending on space
  - Implement Bluesight program to enhance control substance monitoring

- **Continue the following:**
  - Controlled Substances: continued monitoring of controlled substance transactions and documentation processes in the Nursing and Anesthesiology departments by Pharmacy department for quality assurance.
  - Continue to monitor and trend medication overrides and provide feedback to the end users.
  - Continue performing Malignant Hyperthermia (MH) mock codes to ensure proper use of MH cart.
  - Continue detailed daily review of D50 usage via in-basket message to clinical pharmacy dept. (assess for appropriateness of events).
  - Continue Kit Check labeling and barcoding to ensure adequate PAR levels of medications in anesthesia workstations in the OR and crash carts.
  - Pharmacy to continue reviewing the Omnicell Par vs. usage report for proper inventory management.
  - Continue to monitor ADC access to ensure that unauthorized personnel (i.e. upon departure or termination of employment of nursing/anesthesiology/pharmacy staff, etc.) are removed from the system to prevent unauthorized access to medications.
  - Continue reviewing external resources to analyze current practice at CCRMC and improve processes according to the most recent guidelines and literature.
  - Pharmacy to continue assessing compliance with accurate expiration labeling of MDVs by nursing.
  - Ongoing pharmacy staff education to ensure accurate filling of Omnicell.

MERP PLAN FOR THE YEAR 2022

ADMINISTRATION

- **New Processes:**
  - "Dispense tracking," to be implemented to allow nursing and pharmacy to track medications from the time of verification to the unit.
  - Alaris infusion pumps to be updated so that they alarm for unclamped secondary infusions (a feature previously unavailable) to reduce missed dose errors due to line being clamped (historically a top contributor to missed doses at CCRMC)
  - Terminology on Alaris pump to be updated from "basic Infusion" to "No-Guardrails-Basic Infusion," to be more descriptive and eliminate errors where nurse picks basic infusion erroneously."
  - 2 nurses to begin confirming that CADD pump in infusion clinic is running and then have patient stay for 5-10 minutes to ensure that pump is infusing medication appropriately prior to discharge home.

- **Continue the following:**
  - Controlled Substances: continued monitoring of controlled substance transactions and documentation processes in the Nursing and Anesthesiology departments by Pharmacy department for quality assurance.
  - Continue evaluating Alaris Pump infusion knowledge portal and CQI reports and use this for nursing education and modification of drug library.
  - Continue assessment of in-basket messages sent to pharmacy by the nursing department and improve system as necessary.
  - Continue to monitor and trend medication overrides and provide feedback to the end users.
  - Continue reviewing external resources to analyze current practice at CCRMC and improve processes accordingly.
  - Continue to optimize nursing workflow in ccLink in relation to medication management based on routine review of medication errors and MSC feedback.
  - Continue to in-service nursing staff as needed.
  - Continue to monitor barcoding compliance in the nursing environment to achieve the goal of greater than 95% compliance.
  - Continue to review and assess USP 800 & NIOSH guidelines.
  - Multimodal pain management strategies to continue to be optimized via various means as a part of ERAS (early recovery after surgery).
  - Continue to increase awareness and educate staff to prevent missed doses (ex: ensure lines are unclamped).
  - Continue to create guidelines and order-sets pertaining to COVID-19 with administration instructions and nursing communications to ensure safe and appropriate administration of the medications.
  - The heparin taskforce will continue working to resolve issues surrounding heparin infusion
  - Continue monitoring and reporting QA usage data for Alaris and CADD pumps.

MONITORING

- **New Processes:**
  - Pharmacy to explore using a Bayesian program within Vigilanz® to dose vancomycin based on AUC/MIC monitoring.
  - Pharmacy took over the Ambulatory Anticoagulation Clinic previously run by nursing in October 2021.
  - Monitoring efforts for optimization of Omnicell medication stocking to minimize unit dose cart fill volume including:
    - review of the Omnicell "Active Medication Orders without stocked items," report to determine commonly used medications to add to Omnicell
    - Weekly report to be run and sent to pharmacist for assessment of loading medications into unit Omnicell, depending on space
  - Implement Bluesight program to enhance control substance monitoring

- **Continue the following:**
  - Continue all Pharmacy Monitors, including but not limited to DDI checks, clinical conditions, lab monitors and checking for therapeutic appropriateness via data mining software and various EPIC reports [i.e. crystal, dashboard, system lists]). Monitors will be optimized as needed.
    - Monitors in the inpatient setting: vancomycin, heparin infusion, insulin, psychiatric medications, etc.
    - Monitors in the ambulatory setting: Diabetes Care Management Clinic, ESA Clinic, Transitions in care services, etc.
  - Continue reviewing external resources to analyze current practice at CCRMC and improve processes according to the most recent guidelines and literature.
  - Continue all processes under the Antimicrobial Stewardship Program (ASP).
  - Continue monitoring of ADEs (ADRs and medication errors) retrospectively to assess for appropriateness of medication use and monitoring.
  - Continue retrospective review of different systems, reports and processes (ex: rescue medication report, medication error report, ADC utilization report, etc.) for appropriateness of medication use and monitoring from different disciplines (medical staff, nursing, pharmacy, etc.), and implement educational plans for medication monitoring as needed.
  - Continue the physician oversight process for all hypoglycemic events (BG < 50 mg/dl) for patients on insulin at CCRMC to ensure that appropriate actions are taken, and education provided when needed.
  - Optimize all order sets according to available and most recent guidelines.
  - Controlled Substances: continued monitoring of controlled substance transactions and documentation processes in the Nursing and Anesthesiology departments by Pharmacy department for quality assurance.
  - Continue to create guidelines and order-sets pertaining to COVID-19 related treatments to ensure safe and appropriate monitoring of the medications.
  - The heparin taskforce will continue working to resolve issues surrounding heparin infusion
  - Continue extensive monitoring for compounding under the CA State Board of Pharmacy requirements for annual licensure (Primary and secondary engineering controls, staff competency, air sampling, Dynalab® check for potency and endotoxins)

EDUCATION

- **New Processes:**
  - Implement new antibiotic order set, assess utilization and promote use.
  - Implement pharmaceutical waste management compliance monitoring in the inpatient setting which includes a full report of any deficiencies found along with a plan of correction.

- **Continue the following:**
  - Continue all Pharmacy Monitors, including but not limited to DDI checks, clinical conditions, lab monitors and checking for therapeutic appropriateness via data mining software and various EPIC reports [i.e. crystal, dashboard, system lists]). Monitors will be optimized as needed.
    - Monitors in the inpatient setting: vancomycin, heparin infusion, insulin, psychiatric medications, etc.
    - Monitors in the ambulatory setting: Diabetes Care Management Clinic, ESA Clinic, Transitions in care services, etc.
  - Continue reviewing external resources to analyze current practice at CCRMC and improve processes accordingly by optimizing operations and educating staff.
  - Continue to in-service nursing staff as needed.
  - Malignant Hyperthermia: Continue Mock MH drills, collaborating with the Professional Development Dept.
  - Continue formal new pharmacist training and competency assessment for participation in the ASP program, DCM, and ESA Clinics, and all clinical processes upon hire.
  - Continue competency assessments for new pharmacists and pharmacy technicians during orientation.
  - IV competency training (Critical Point) is completed by pharmacists and technicians
  - IV competency training for nursing staff.
  - Continue the Transitions of Care (TC) Program and provide education to patients to promote safe medication use.
  - Continue retrospective review of different systems, reports and processes (ex: rescue medication report, medication error report, ADC utilization report, etc.) for appropriateness of medication use and monitoring from different disciplines (medical staff, nursing, pharmacy, etc.), and implement educational plans for medication monitoring as needed.
  - Continue evaluating Alaris Pump infusion knowledge portal and CQI reports and use this for nursing education and modification of drug library.
  - Continue evaluating CADD pump CQI reports and use this information for education and modification of drug library.
  - Continue to optimize educational efforts to ensure safe and appropriate prescribing and administration of insulin at CCRMC.
  - Provide further education to nursing to address the issues surrounding heparin infusion administration.
  - Continue pharmaceutical waste management compliance monitoring in the ambulatory setting which includes a full report of any deficiencies found along with a plan of correction.

USE

- **New Processes:**
  - "Dispense tracking" to be implemented to allow nursing and pharmacy to track the medications from the time of verification to the floor.
  - Implement new antibiotic order set, assess utilization and promote use.
  - Explore barcode scanning in the willow ambulatory environment in MIP.
  - Pharmacy to work with ccLink IT to optimize the high potency pain medication order set section with oral opiate medications to ensure safe and appropriate use.
  - Implement Bluesight program to enhance control substance monitoring

- **Continue the following:**
  - Controlled Substances: continued monitoring of controlled substance transactions and documentation processes in the Nursing and Anesthesiology departments by pharmacy department for quality assurance.
  - Continue evaluating Alaris Pump infusion knowledge portal and CQI reports and use this for nursing education and modification of drug library.
  - Continue evaluating CADD pump CQI reports and use this information for education and modification of drug library.
  - Continue reviewing external resources to analyze current practice at CCRMC and improve processes accordingly by optimizing operations and educating staff.
  - Malignant Hyperthermia: Continue Mock MH drills, collaborating with the Professional Development Dept.
  - Continue pharmacy monitors/programs, including but not limited to anticoagulants, high alert medications, therapeutic drug monitoring, antimicrobial stewardship program (in conjunction with ID physician), transitions of care services, DCM Clinic, ESA Clinic etc.
  - Continue assessment of in-basket messages sent to pharmacy by the nursing department and improve system as necessary.
  - Continue Kit Check labeling and barcoding to ensure adequate PAR levels of medications in anesthesia workstations in the OR and crash carts.
  - The heparin taskforce will continue working to resolve issues surrounding heparin infusion

TECHNOLOGY

- **New Processes:**
  - "Dispense tracking" to be implemented to track the medications from the time of verification to the floor.
  - Explore barcode scanning in the willow ambulatory environment in MIP.
  - Pharmacy to explore using a Bayesian program within Vigilanz® to dose vancomycin based on AUC/MIC monitoring.
  - Implement new antibiotic order set, assess utilization and promote use.
  - Pharmacy to work with ccLink IT to optimize the high potency pain medication order set section with oral opiate medications to ensure safe and appropriate use.
  - Pharmacy to begin working with ccLink IT to optimize antidote orders in ccLink to promote safe, correct and effective use.
  - Alaris infusion pumps to be updated so that they alarm for unclamped secondary infusions (a feature previously unavailable) to reduce missed dose errors due to line being clamped (historically a top contributor to missed doses at CCRMC)
  - Terminology on Alaris pump to be updated from "basic Infusion" to "No-Guardrails-Basic Infusion," to be more descriptive and eliminate errors where nurse picks basic infusion erroneously."
  - Omnicell XT conversion to be completed. XT upgrade ensures patient data security, has metal locking bins (higher security for narcotics), and Omnidispensers rather than coils which will cause less jams and is more space efficient/higher capacity.
  - Implement Bluesight program to enhance control substance monitoring
  - Implement Key Solutions Program to optimize tracking for Investigational Drugs
  - Efforts for optimization of Omnicell medication stocking to minimize unit dose cart fill volume including:
    - review of the Omnicell "Active Medication Orders without stocked items," report to determine commonly used medications to add to Omnicell
    - Weekly report to be run and sent to pharmacist for assessment of loading medications into unit Omnicell, depending on space

- **Continue the following:**
  - Continue evaluating Alaris pump infusion knowledge portal and CQI reports and use this for nursing education and modification of drug library.
  - Continue evaluating CADD pump CQI reports and use this for education and modification of drug library.
  - Continue barcoding scanning upon dispensation and administration.
  - Continue on reviewing all order sets on a multidisciplinary note in ccLink as opportunities for improvement are identified, and work on new order sets as needed.
  - Continue to improve and enhance technological tools (i.e. ccLink, Alaris) as a result of medication error trending and analysis.
  - Continue with all processes under the Antimicrobial Stewardship Program (ASP).
  - Continue Kit Check labeling and barcoding to ensure adequate PAR levels of medications in anesthesia workstations in the OR and crash carts.
  - Pharmacy to continue reviewing the Omnicell par vs. usage report for proper inventory management.
  - Continue to promote safe and appropriate use of insulin via technology (i.e. order set optimization, BPA alerts, in basket messages, etc.)
  - Multimodal pain management strategies to be optimized via various means (order set/ EHR updates, formulary additions, etc.) as a part of ERAS (early recovery after surgery)
  - Continue pharmacy monitors/programs with the utilization of technological tools such as system lists and dashboard reports via EPIC as well as data mining software (i.e. Vigilanz®).
  - Continue monitoring of ADEs (ADRs and medication errors) retrospectively with utilization of technological tools.
  - The heparin taskforce will continue working to resolve issues surrounding heparin infusion calculator.

TRANSITIONS IN CARE

- **New Processes:**
  - Implementation of "Dispense tracking," to allow nursing and pharmacy to track the medications from the time of verification to the unit.

- **Continue the following:**
  - Continue the Transitions of Care (TC) Program and provide education to patients to promote safe medication use, including admission medication reconciliation for "High Risk," patients as defined by CCRMC. Admission medication reconciliation for "High risk," patients was initiated in December 2018.
  - Continue to provide necessary medications with appropriate quantity for homeless patients.
  - Continue to educate nurses during nursing orientation that medications must be transferred with patient from one unit to the next.

Medication Error Data Analysis, 2021 Annual Report

Committee Name: Medication Safety Committee
Meeting Date: Feb 18, 2022
Preparation Date: January 2022

Issue Name: Medication Error Data Analysis, Annual Summary	Presenter: Pharmacy

Situation: Medication Error Report, Summary

Background: Beginning in 2010, CCRMC began categorizing medication errors into one of eleven different categories. Those categories (known as 'Elements') were defined by the California Department of Public Health (CDPH). In June 2012, these elements were redefined and expanded into twelve different "Event Categories." The event categories are as follows:

1. Prescribing	4. Compounding	7. Administration of Medication	10. Use
2. Prescription Order Communication	5. Dispensing	8. Monitoring	11. Technology
3. Product Labeling, Packaging and Nomenclature	6. Distribution	9. Education	12. Transitions in Care

These event categories and subcategories have been programmed into SERS (Safety Event Reporting System).

Once medication events have been categorized into one of the above event categories, they are assessed for severity level (per NCC MERP scale) as follows:

Level A	Circumstances or events that have the capacity to cause error
Level B	An error occurred but the error did not reach the patient
Level C	An error occurred that reached the patient but did not cause patient harm
Level D	An error occurred that reached the patient and required monitoring to confirm that it resulted in no harm to the patient and/or required intervention to preclude harm
Level E	An error occurred that may have contributed to or resulted in temporary harm to the patient and required intervention
Level F	An error occurred that may have contributed to or resulted in temporary harm to the patient and required initial or prolonged hospitalization
Level G	An error occurred that may have contributed to or resulted in permanent patient harm
Level H	An error occurred that required intervention necessary to sustain life
Level I	An error occurred that may have contributed to or resulted in the patient's death

This report highlights the medication error trends that occurred in 2021, along with the etiologies of the error trends and system improvements made as a result of the errors. The specifics of these trends will be presented by run charts.

Data Source:

Medication errors are voluntarily reported by staff who become aware of errors using the SERS reporting system. The pharmacy department uses various methods including ccLink reports, clinical monitors, automated dispensing cabinet audits, and other fact-finding strategies to detect medication errors and enter them in SERS. *Pharmacy department promotes transparency and awareness in the organization and uses SERS as an approach to identify areas for improvement so that strategies could be implemented to correct these issues. Pharmacy department generates the most SERS of the organization in order to support this methodology for improvement.* Reports are reviewed, referred for further input, and analyzed by the Medication Safety Advocates. The medication error review process is multi-disciplinary, with at least one physician present at all times, and 100% of all errors are reviewed. Data is tabulated and trended monthly and annually.

Data Highlights and Totals:

- There were 498 medication related SERS reported in 2021, compared to 508 in 2020, 879 in 2019 and 1,115 in 2018. When looking at the percent of errors reported (# of errors/ # of doses dispensed), there was a 0.05% error rate in 2021, vs. 0.05% in 2020 and 0.07% in 2019. The decrease in percent error rate can in large part be attributed to the reduction in controlled substance discrepancies since 2019 to 2020 and 2021. The decrease is as a result of the ongoing efforts by Pharmacy, Nursing and Anesthesiology to minimize controlled substance discrepancies (technological enhancements, education, etc.) along with oversight from the Opioid Stewardship Program Committee. It is important to note that 100% of controlled substance discrepancies are investigated and resolved.
- The median harm index previously dropped to 0% in March of 2020 and has remained stable at 0% through 2021. The organization promotes transparency and encourages staff to report medication errors, including near miss medication events. The majority of errors reported did NOT result in harm. Specifically, in 2021, 99.2% of errors reported did NOT result in harm.
- Pharmacy leadership continues to promote reporting of medication events for system and process improvement reasons. There was a total of 1,235 near miss medication events in 2021 (297 events reported via SERS and while not discussed in this annual SERS report, 938 near misses captured via the Alaris pump), vs 1,287 near miss medication events in 2020 (4% reduction), and 1861 events in 2019 (33.6% reduction). The decrease in near miss errors in 2021 compared to 2020 and 2019 is as a result of the intense education, monitoring and process changes implemented.
- Medication errors by drug class: Controlled substances and antimicrobials have persistently been the top medication classes involved in medication errors at CCRMC since 2010.
    - There were 250 medication errors with controlled substances in 2021, a 55% reduction since 2018. (229 in 2020, 449 in 2019 and 558 in 2018). The large number of SERS are generated due to the controlled substance discrepancy monitoring program by pharmacy, which utilizes SERS as a method to report and resolve discrepancies. This decline is due to the ongoing efforts by Pharmacy, Nursing and Anesthesiology to minimize controlled substance discrepancies at CCRMC via technological enhancements and education, along with oversight from the Opioid Stewardship Program Committee.
        - The reduction in controlled substance discrepancies is due to the ongoing monitoring and reporting of controlled substance discrepancies on a daily basis by pharmacy. In 2020, CCRMC was recognized in the Cal Hospital Opioid Care Honor Roll as one of the 25 hospitals ranked in the "superior performance." Going forward in 2022, pharmacy will continue to monitor and report-controlled substance discrepancies. The multidisciplinary Opioid Stewardship Committee will continue to meet on a quarterly note to review guidelines and regulations and optimize pain management strategies at CCRMC.
    - There were 42 medication errors involving antimicrobials in 2021 – a 26% reduction compared to 2020, 44% reduction compared to 2019 and a 58% reduction since 2018 (57 in 2020, 75 in 2019 and 101 in 2018). 42/42(100%) of errors did not cause harm (Level D and lower).
        - The top error type involved missed doses.
            - Missed doses due to clamp errors or incorrect tubing connections: 7 errors in 2021 vs. 8 errors in 2020,14 errors in 2019 and 15 errors in 2018 – a 13% reduction since 2020, 50% reduction since 2019 and 58% since 2018. There are several processes in place from previous years that have contributed to the downtrend of clamp errors and maintaining a low number of errors (i.e., monthly feedback provided from Pharmacy to Nursing leadership, Nursing Program Managers and the Department of Quality, audits by pharmacy and nursing, education by the professional development department, alert in Alaris pump, etc.). Going forward in 2022, the Alaris infusion pumps will be updates to alarm for unclamped secondary infusions which was a previously unavailable feature. This is planned to go live in the beginning of 2022.
            - 6 missed/delayed doses were due to incorrect verification of antimicrobial medication, 5 of 6 were from Rxe-source pharmacists (remote After-hours pharmacy). Following each of these events, education was provided to the pharmacists involved through monthly meetings with the Rxe-source director.
        - The second most common error type involved vancomycin trough monitoring. There were 4 errors in 2021 vs. 8 errors in 2020, 9 errors in 2019, and 15 errors in 2018 – a 50% reduction since 2020, 56% reduction since 2019 and 73% since 2018. The reduction can be attributed to ongoing staff education. Towards the end of 2021, a BPA was created by ccLink per pharmacy's request to alert nurses of any vancomycin trough due within 2 hours of the vancomycin dose due time. This BPA is in addition to the robust process already in place which includes: 1)sign & held vancomycin trough order 2) MAR communication note by pharmacy to nursing 3) MAR flowsheet hard stop question to nursing about if a vancomycin trough is due. Pharmacy is also in the process of exploring the possible launch of AUC/MIC monitoring for select indications utilizing Bayesian software through data mining software (i.e., Vigilanz) in 2022 to further optimize vancomycin drug monitoring.

- "High Alert," Medication Error trends are as follows:
  - The number of high-alert medication errors decreased from 95 errors from 2018 → 74 errors in 2019→ 56 errors in 2020→ 44 errors in 2021 (a 21% reduction from 2020, a 41% reduction from 2019 and a 53% reduction from 2018.) The median harm index (Level E and higher events) for 4 of the 5 high alert categories has been 0 since Q1 2015, meaning that none of the errors contributed to patient harm (anticoagulants, chemotherapeutics, fentanyl patch and PCAs). While insulin's median harm index has been at 2 errors per month since Q1 2018 (due to increased vigilance and reporting by pharmacy), the percent rate of severe hypoglycemia (BG ≤ 50 mg/dl) has declined from 3.5% in 2017 to 2.2% in 2018 and further down to 1.2% since February 2019.

  - Insulin errors: There were 22 errors involving insulin in 2021, vs. 20 errors in 2020, 34 errors in 2019 and 43 errors in 2018. Despite slight increase from 2020 to 2021, there was an overall 49% reduction from 2018 and a decline in median from 9 errors per quarter to 5 errors per quarter starting in Q2, 2020. The reduction can mainly be attributed to the 82% decline in errors involving inappropriate management of patients on SubQ insulin from 2018 to 2021 and the 63% decline in MDV labeling errors from 2019 to 2021. In 2021, the main error types surrounding insulin were IV insulin drip management and MDV labelling errors followed by inappropriate management of patients on SubQ insulin. There were 3 delays in initiating the insulin drip in the ED prior to transfer to the unit. The NPM was informed of these errors and staff was educated. There were also 3 errors surrounding IV to SubQ conversion (2 cases in which the insulin drip was not stopped per protocol by the nurse upon conversion to SubQ insulin and 1 inappropriate IV to SubQ dose conversion by the provider). Education was provided in all cases. Additionally, the IV to SubQ conversion instructions are available for providers in the SubQ insulin order sets, and pharmacy continues to monitor insulin drips on a daily basis. Of the errors surrounding SubQ insulin, 3 were inappropriate management of patients on SubQ insulin. Education was provided in all cases, and process changes were implemented via order set optimizations. Overall, the inappropriate management of patients on SubQ insulin has decreased by 82% since 2018. In 2018, a multi-disciplinary task force was created and began meeting regularly to address the issues surrounding SubQ insulin management. Several optimizations have been made in ccLink since then, along with education and increased awareness among staff. A daily physician oversight process was also implemented in 2019, resulting in all cases of severe hypoglycemia being reviewed by a physician to ensure the appropriate steps were taken to prevent any further hypoglycemic events and to communicate any additional actions needed to the primary team. Education was also optimized and provided to medical staff via. E. Learning. In 2021, the standalone regular IV insulin order was removed so that it is only available through the order sets and panels which include safety guards for prevention and management of hypoglycemia. The pre-op order sets were also updated to include a pre-checked dextrose containing fluid order for diabetic patients. Going forward in 2022, pharmacy will continue to interpret and report data and the Insulin taskforce will continue to review the data and optimizes processes as needed.
  - Anticoagulant errors: There were 15 errors involving anticoagulants in 2021, vs. 18 errors in 2020, 24 errors in 2019 and 32 errors in 2018. There was a 17% reduction in errors from 2020 to 2021, a 38% reduction in errors from 2019 to 2021 and a 53% reduction from 2018 to 2021. The majority of errors since 2017 have involved heparin infusion errors (ex: missed or delayed aPTT result, rate not adjusted in a timely manner, wrong rate, etc.). In 2017, a multi-disciplinary task force was initiated to address the issues surrounding heparin infusion. In 2018, several improvement actions took place. In July 2019, a heparin calculator went live in ccLink. While errors from 2017 and 2018 decreased (heparin rate not being adjusted in a timely manner, lab timing errors by lab and nursing), the heparin calculator introduced a new set of errors involving the misuse and inconsistent use of the heparin calculator by nursing staff. The heparin calculator works well when used correctly. However, due to technological limitations, use of the heparin calculator is not mandatory in ccLink which has led to inconsistent and incorrect use of the calculator. Currently the heparin calculator is "required" for the initial administration but not for subsequent titrations due to limitations of ccLink. Additionally, in 2021 a new error peaked which involved repeat STAT aPTT not being ordered per protocol by nursing for a supratherapeutic aPTT > 120 seconds. This redundant STAT aPTT is used as a preventative measure to rule out any errors of sampling from the line running heparin as an essential safety measure from the medication safety perspective. Education was provided in all cases. Additionally, the heparin task force began meeting again towards the end of 2020 to update the heparin calculator tip sheet and to reinforce education for nursing staff. In January 2021, dual sign off was added to all heparin administrations, previously was only available for 'Initial Infusion'. In April 2021, the heparin calculator text was updated to make each section "initial dose" and "subsequent titrations" stand out more. In order to prevent errors of calculator misuse/unuse, the nursing staff in 3D/3E (where the majority of errors occurred) began using a bedside heparin infusion worksheet to assist with titrations and began huddling during the shift when patients are actively on heparin to remind nurses to use the heparin calculator for all heparin titrations. The heparin task force will continue to work to minimize heparin infusion errors via education of staff and process changes when appropriate. Additionally in October 2021, the ambulatory anticoagulation clinic was taken over by pharmacy (previously a nursing run clinic).
  - Chemotherapeutic errors: There were 4 errors reported in 2021, vs. 14 in 2020, 8 in 2019 and 13 in 2018. In 2021, 50% (2 out of 4 errors) involved errors with the CADD pump (1 errors due to battery depletion despite extra batteries given to patient along with patient education, 1 due to the pump leaking- After thorough investigation of the cause of leak, it was

found that the tubing may have also been the culprit of the leak).There was a 67% reduction in errors from 2020 to 2021. This is due to purchasing a new smart pump (CADD Solis) in October 2020 to replace the old CADD pumps which contributed to the majority of chemotherapy errors in 2020. Infusion clinic went live with the new pumps in October 2020. The infusion nursing staff continue to send extra batteries home with the patients along with an instruction sheet on how to switch the batteries out. Pharmacy will continue to monitor for CADD pump errors.

- Fentanyl patch errors: There were 0 fentanyl patch errors reported in 2021, vs. 1 in 2020, 0 in 2019 and 3 in 2018. Several efforts are in place to ensure safe use of fentanyl patch at CCRMC, including a thorough initial screening for appropriateness by the clinical pharmacy department along with a daily clinical monitor and patient education. Additionally, in 2020 pharmacy made the fentanyl patch require dual pharmacist independent verification as an extra step to ensure safe use of fentanyl patch. As a result, in 2021, there were 0 fentanyl patch errors. Going forward in 2022, staff will continue to be vigilant to ensure safe and appropriate use of fentanyl patch at CCRMC.
- PCA errors: There were 3 errors involving PCA in 2021, compared to 3 errors in 2020, 6 errors in 2019 and 7 in 2018. There was a 57% decrease in PCA errors from 2018 to 2021. None of the errors resulted in patient harm (Level D or higher). Education was provided to staff involved in all cases.
- NOTE: We have observed a decrease or steady median in all cited above compared to prior years.

- MERP Element Trends for 2021: All the MERP element medians remained stable or declined in 2021, with the exception of "Administration," which increased slightly.
  - Administration: In 2021, there was an increase in median administration errors per month from 12 to 14 starting in July 2021, however previously there was a reduction from 30.5 errors per month to 18.5 errors per month from November 2020 -February 2021, and a further decrease down to 12 from March 2021- June 2021. The top error types that peaked were override errors and missed dose errors. While these errors were the top error types, they had overall reductions since 2019 by 56% for overrides and 29% for missed doses due to ongoing efforts by the organization. There was a slight increase in missed doses from 2020 (25 missed doses) to 2021 (36 missed doses). This likely contributed to the increase in median from 12 to 14 errors per month starting in July 2021. Additionally, there was an increase in errors involving acetaminophen scheduled order dose being administered too soon after a x1 dose. In regards to missed doses, the majority were due to the nurse being busy/ distracted and forgetting to administer dose, but no trend was noted (64% increase from 2020 to 2021). This increase may likely be because in 2020 the hospital census was lower. In 2021, the census increased and at the same time the number of COVID patients tripled which caused nurses to be busier are more overwhelmed. The second highest cause of missed doses was due to medication line being clamped. Education was provided in all cases. There are also several processes in place from previous years that have contributed to the downtrend of clamp errors. Going forward in 2022, the Alaris infusion pumps will be updates to alarm for unclamped secondary infusions which was a previously unavailable feature. This is planned to go live in the beginning of 2022. In regards to acetaminophen doses being administered too soon, a BPA is in the process of being created per the request of pharmacy to alert nursing if a dose was previously given within the last 3 hours. Going forward, pharmacy will continue to monitor, and trend missed doses and overrides.
  - Prescribing: The median number of prescribing errors per month decreased from 7 errors per month to 2 errors per month starting in December 2019 (a 71% reduction). This is as a result of the improvements seen in reducing the number of overrides (90% reduction since 2018) and reducing duplications in therapy (77% reduction since 2019) via order set changes and order panel creation. In 2021, the top error types involved SubQ insulin management and medications prescribed and given too soon after a dose had already been given (40% involved acetaminophen). In 2021, pre-procedure order sets were optimized to include a prechecked dextrose containing fluid for diabetic patients and the standalone IV insulin order was removed so that it is only available via order panels and order sets. For medication prescribed and given too soon, a BPA is in the process of being created per pharmacy's request to alert nurses of previous administration of acetaminophen within the last 3 hours.
  - Prescription Order Communication: Looking back at 2021, there was a decrease in median from 1 error per month to 0 errors per month starting August 2020 through 2021. The top error type in previous years was due to missed doses as a result of a communication error. However, there was a 100% improvement from2018 and 2020 to 2021. In 2021, the 2 main error types were communication orders resulting in delayed restarting of titratable drips after a procedure and medication being ordered incorrectly, resulting in an unintentional dose being administered. There was no harm to any of the patients as a result of these errors. Going forward in 2022, pharmacy will continue to monitor prescription order communication errors for any trends and act accordingly.
  - Product Labeling, Packaging, and Nomenclature: Looking back at 2021, the median number of errors per month decreased from 2.5 to 0 starting in September 2020. There was a 53% reduction in MDV expiration labeling errors by nursing from 2019 to 2021 as a result of several optimizations previously made (pharmacy providing a list of Omnicell MDVs on each nursing unit, nursing cycle counts each shift, 28-day calendar tool provided by pharmacy to nursing and nursing education).
  - Compounding: The median number of compounding errors remained stable at 0 errors per month in 2021. In 2021, there were 2 errors in which nurses compounded the medication in the wrong fluid outside of pharmacy hours. All IV

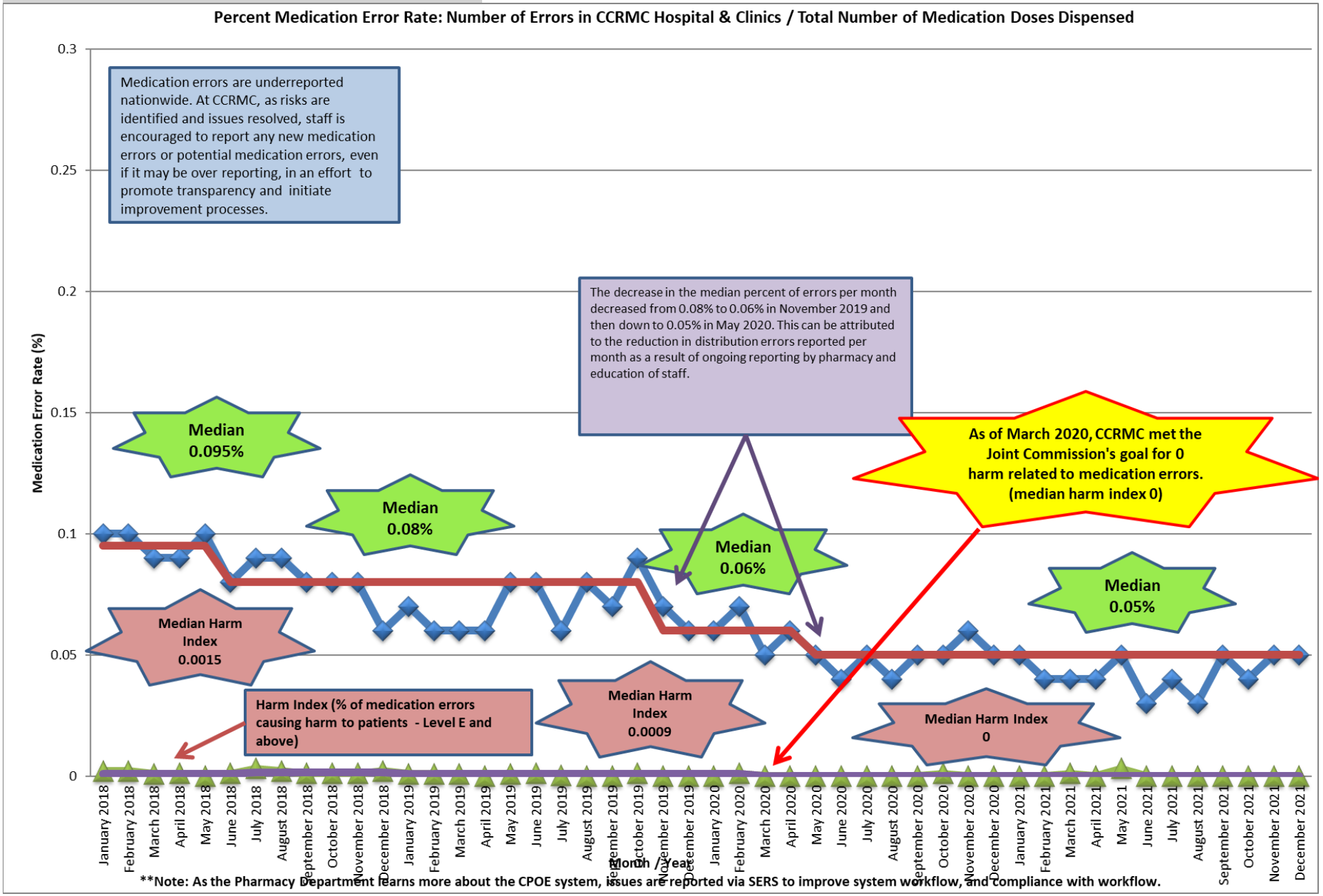
orders specify what fluid the medication is compounded in as part of the order. Also, the drug compatibility chart is available to all nursing staff. In both cases, the fluid used was compatible with the medication being admixed. Pharmacy reached out to NPM to educate staff and will continue to work with nursing leadership to prevent compounding errors. Additionally, pharmacy continues to conduct IV training for nursing staff on an annual basis.

- Dispensing: The median number of errors per month decreased from 3.5 to 1.5 errors starting in December 2020. There was a 64% decrease in wrong dose/strength/formulation/medication being dispensed from 2018 to 2021 and a 63% reduction in dispensing delays from 2018 to 2021. The reduction in median can be attributed to the optimization of barcode scanning in the pharmacy department that occurred in 2018 (expanded to include first dose and cart-fill non-IV medication- IV medications have been barcode scanned since inception of ccLink) The pharmacy department will continue to utilize barcode scanning and explore expansion of barcode scanning to the Willow ambulatory environment in 2022.
- Distribution: There was a decrease in median from 34.5 to 21 errors per month starting in January 2020. This can in large part be attributed to 1) the 55% reduction in controlled substance discrepancies from 2018 to 2021 due to the ongoing monitoring and reporting of controlled substance discrepancies on a daily basis by pharmacy, 2) the 44% decrease in Omnicell issues from 2020 to 2021 and #3) the 27% decrease in MDV labeling errors from 2020 to 2021 as a result of several optimizations previously made. Going forward in 2022, The Omnicells will be upgraded from G4 to XT (allows for better patient data security, higher narcotic security with metal locking bins rather than plastic, and Omnidispensers instead of coils which will cause less jams and are more space efficient/ increase capacity).
- Use: There was a decrease in the median errors per month from 34.5 to 21 starting in January 2020. There was an overall 55% decrease in controlled substance discrepancies since 2018 due to the ongoing monitoring and reporting of controlled substance discrepancies on a daily basis by pharmacy.
- Monitoring: Looking back at 2021, the median number of errors per month decreased from 2 to 0 starting in April 2020 through 2021. There was a 33% reduction in number of vancomycin trough errors from 2020 to 2021 as a result of ongoing education. Additionally, to further reduce vancomycin trough errors, a BPA was created at the end of 2021 to alert nurses of a trough order within 2 hours of the vancomycin due time. In 2021, there was an increase in heparin infusion errors (see the "High Alert- Anticoagulants" section for further details of errors and actions taken).
- Education: Looking back in 2021, the median number of errors per month decreased from 7.5 to 3.5 starting in March 2020 and increased to 5.5 in September 2020. The majority of education errors are also classified under the other elements that apply to the error and are further discussed and trended under those elements. The top error types in 2021 included delays in therapy and failure to monitor (heparin drip errors). Education was provided in all cases. See the "High Alert- Anticoagulation" section for further details regarding heparin drip errors and actions taken. Going forward in 2022, pharmacy will continue to work with nursing leadership and the Professional Development Department to promote ongoing education to prevent delays in therapy and heparin drip errors.
- Technology: Looking back at 2021, the median number of errors per month decreased from 2 to 1 starting in November 2020. In 2021, there was an 60% reduction in errors involving Omnicell and 43% reduction in IV pump issues since 2020. In 2021, there was a 71% decrease in CADD pump malfunctioning errors from 7 in 2020 to 2 in 2021 in infusion clinic. In October 2020, new smart CADD Solis pumps were purchased for infusion clinic and went live. Pharmacy will continue to trend CADD pump data and report findings to the Medication Safety Committee. Additionally, going forward in 2022, the Omnicells will be upgraded from G4 to XT (allows for better patient data security, higher narcotic security with metal locking bins rather than plastic, and Omnidispensers instead of coils which will cause less jams and are more space efficient/ increase capacity). Pharmacy will continue to trend and monitor technological errors.
- Transitions of Care: Looking back at 2021, the total number of errors involving transitions of care decreased from 2 in 2020 to 1 2021. The was a 50% reduction in errors involving patient transfer within the hospital from one unit to the next from 2020 to 2021. In 2020, pharmacy and nursing focused on educating staff which contributed to the decline in errors reported. Simultaneously, in 2020, pharmacy explored utilizing a dispense tracking system to help with locating missing doses that have already been dispensed. In 2021, the necessary equipment was purchased and going forward in 2022, the pharmacy department will plan to work with ccLink IT to pilot the dispense tracking system when it is fully functional.

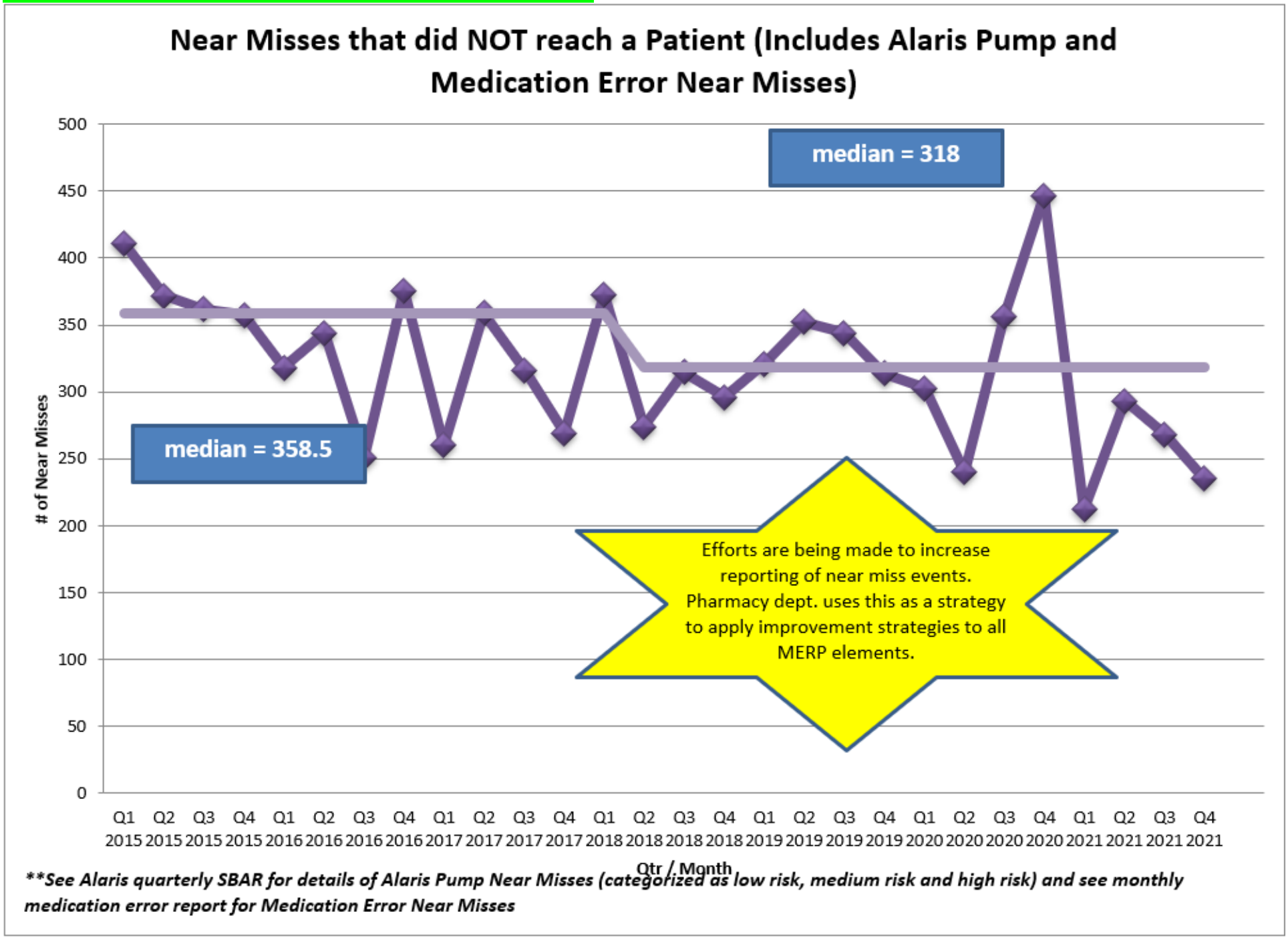
- RXe-Source Pharmacy (After hours pharmacy) medication errors trend:
  - In 2021, RXe-Source pharmacy contributed to 7 errors vs. 11 errors in 2020, 18 errors in 2019 and 14 errors in 2018. Education was provided to the pharmacists involved in all cases per the RXe-Source director.
  - 3 of the errors in 2021 (43%) involved antibiotics (2 wrong formulation [IVPB to injection and 1 inappropriate verification of non-formulary order]).
  - There were 4 level B errors and 3 Level C errors. Thus 4/7 (57%) were near misses that did not reach the patient and none of the errors contributed to patient harm.

Conclusion: The MERP program has been effective in detecting medication errors and in developing corrective actions taken for the past year. The annual SERS review was completed in February 2022.

APPENDIX A: PERCENT MEDICATION ERROR RATE GRAPH

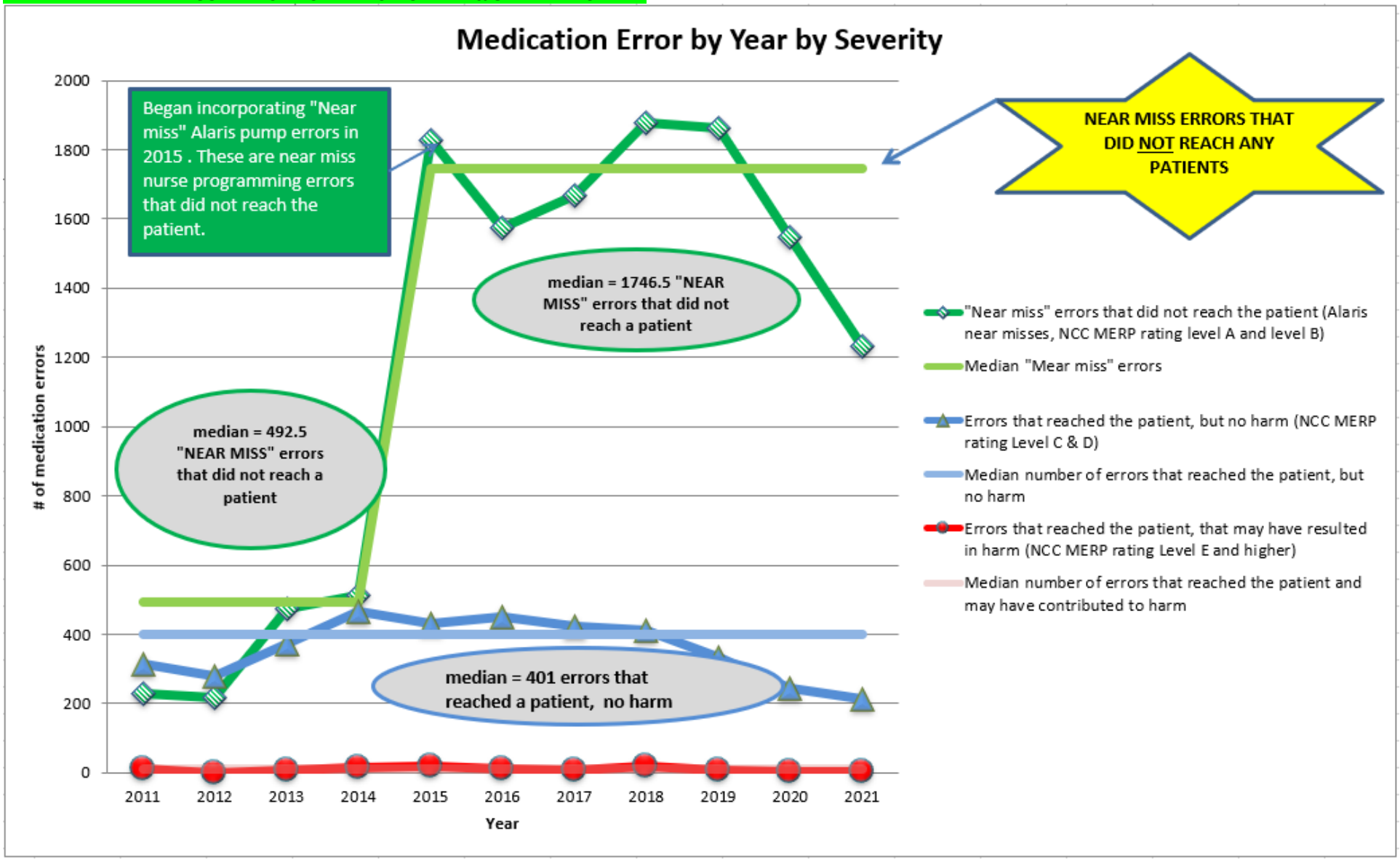


APPENDIX B: NEAR MISS MEDICATION ERROR GRAPH & SEVERITY GRAPH

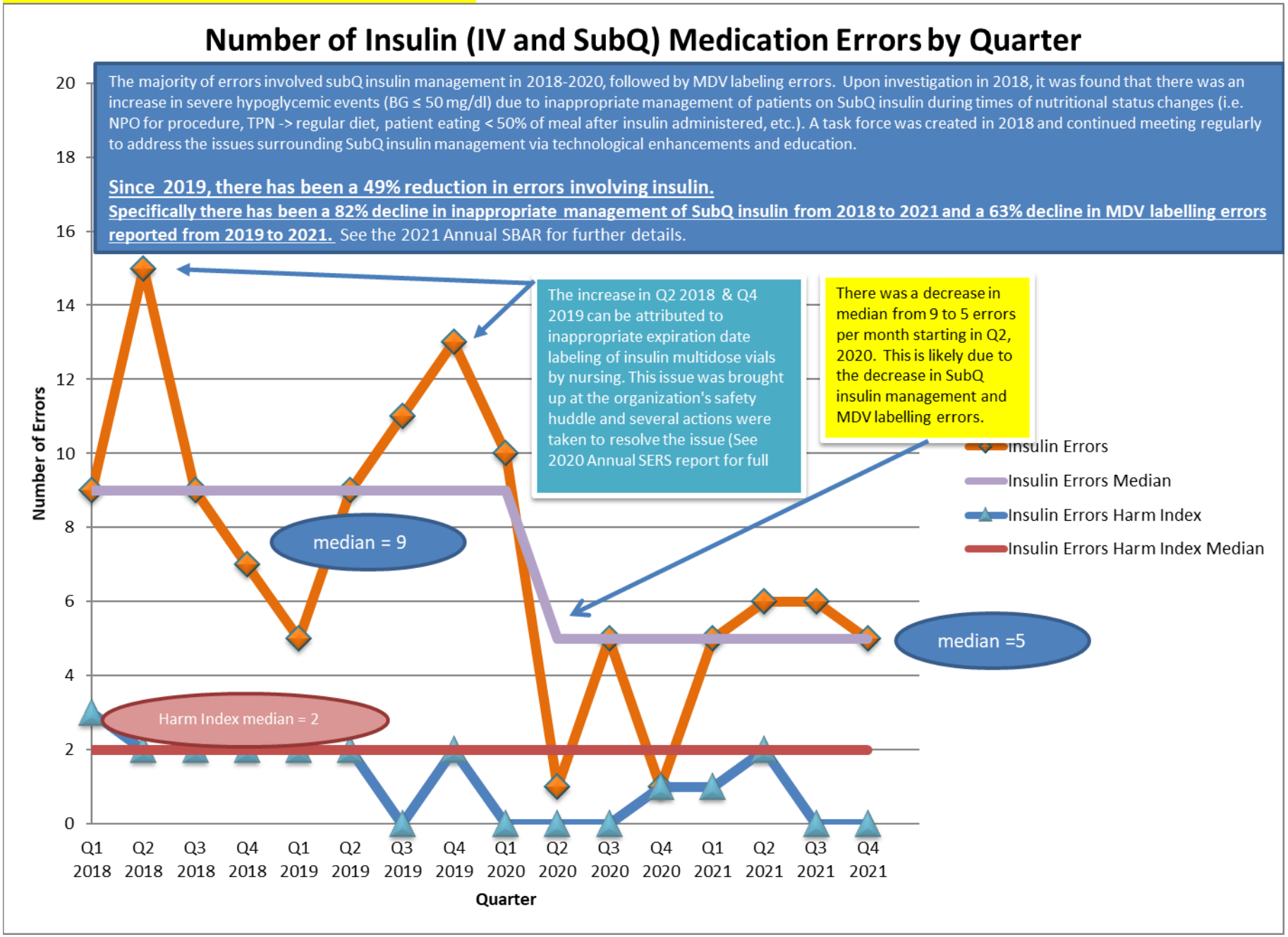


See Alaris quarterly SBAR for details of Alaris Pump Near Misses (categorized as low risk, medium risk and high risk) and see monthly medication error report for Medication Error Near Misses

APPENDIX B: NEAR MISS MEDICATION ERROR GRAPH & SEVERITY GRAPH



APPENDIX C: HIGH ALERT MEDICATION ERROR GRAPHS



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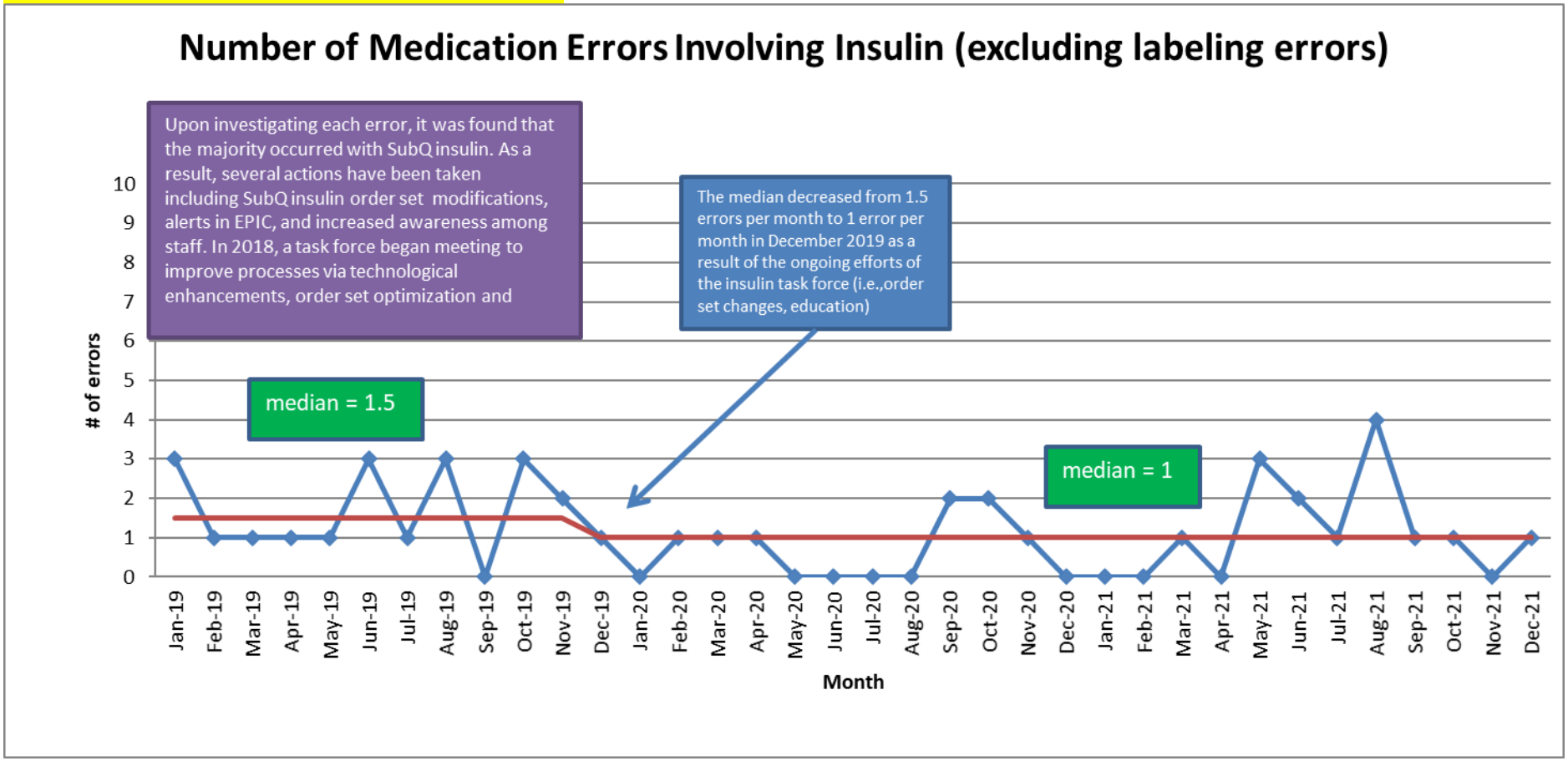

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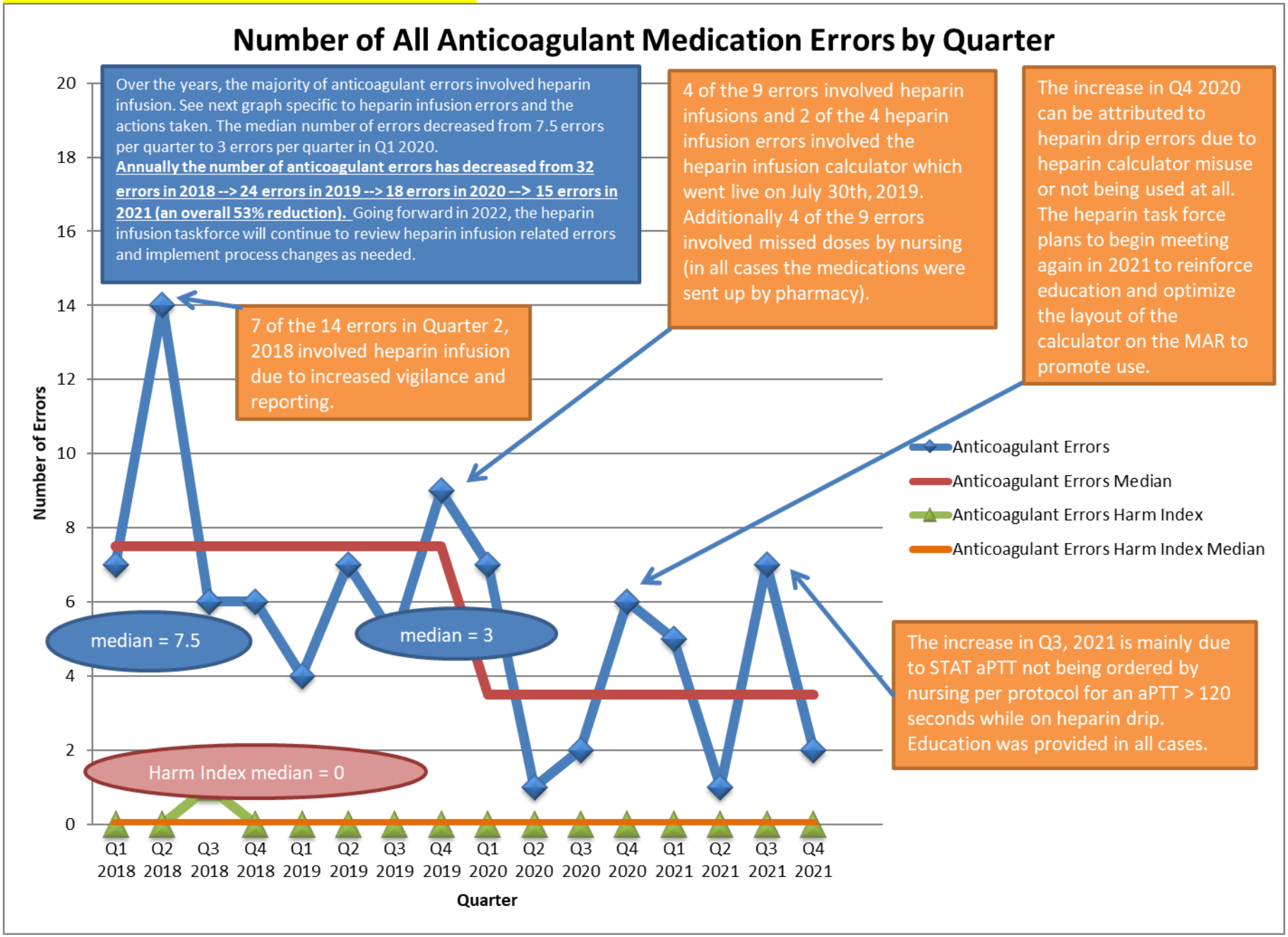
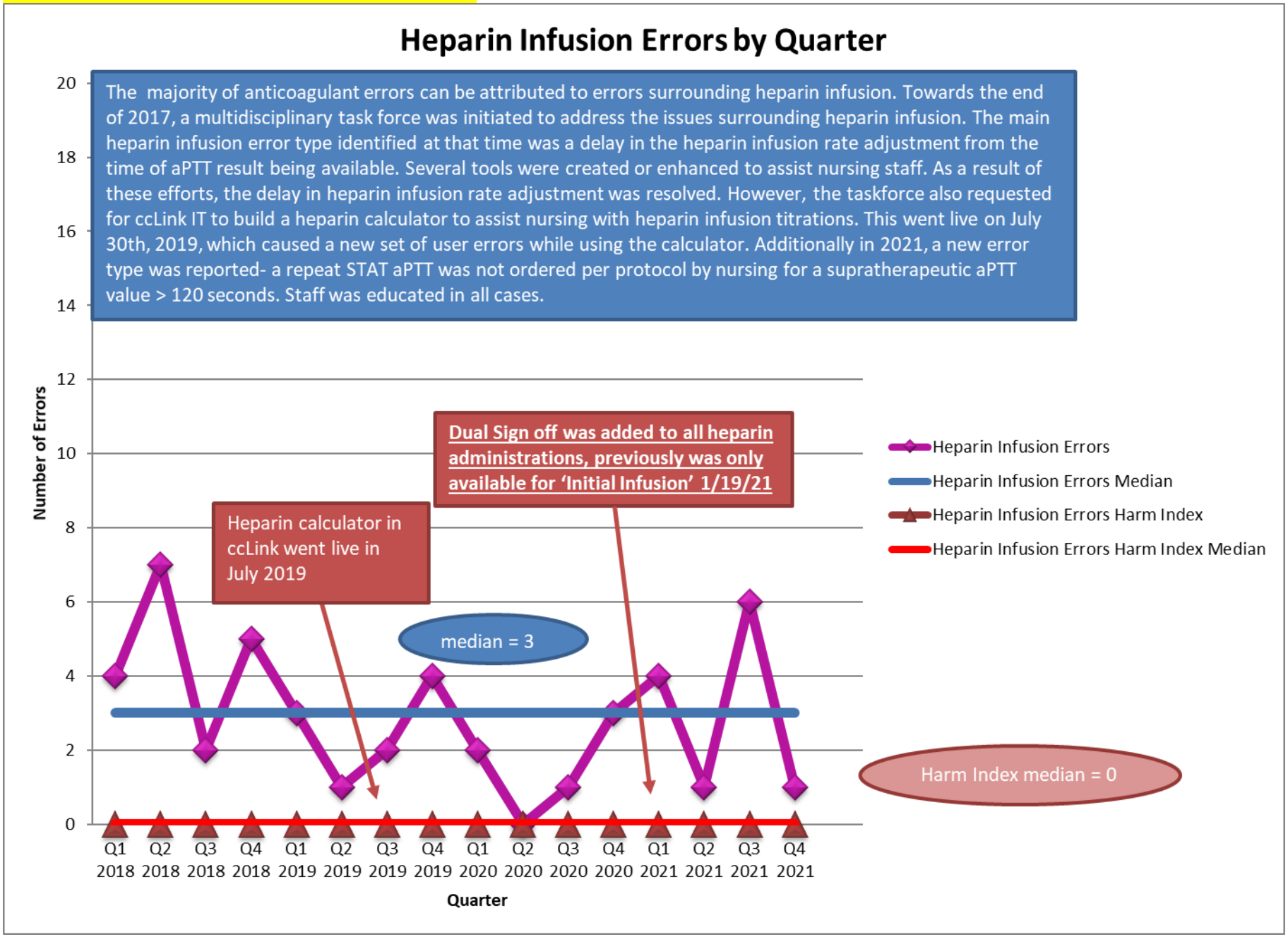
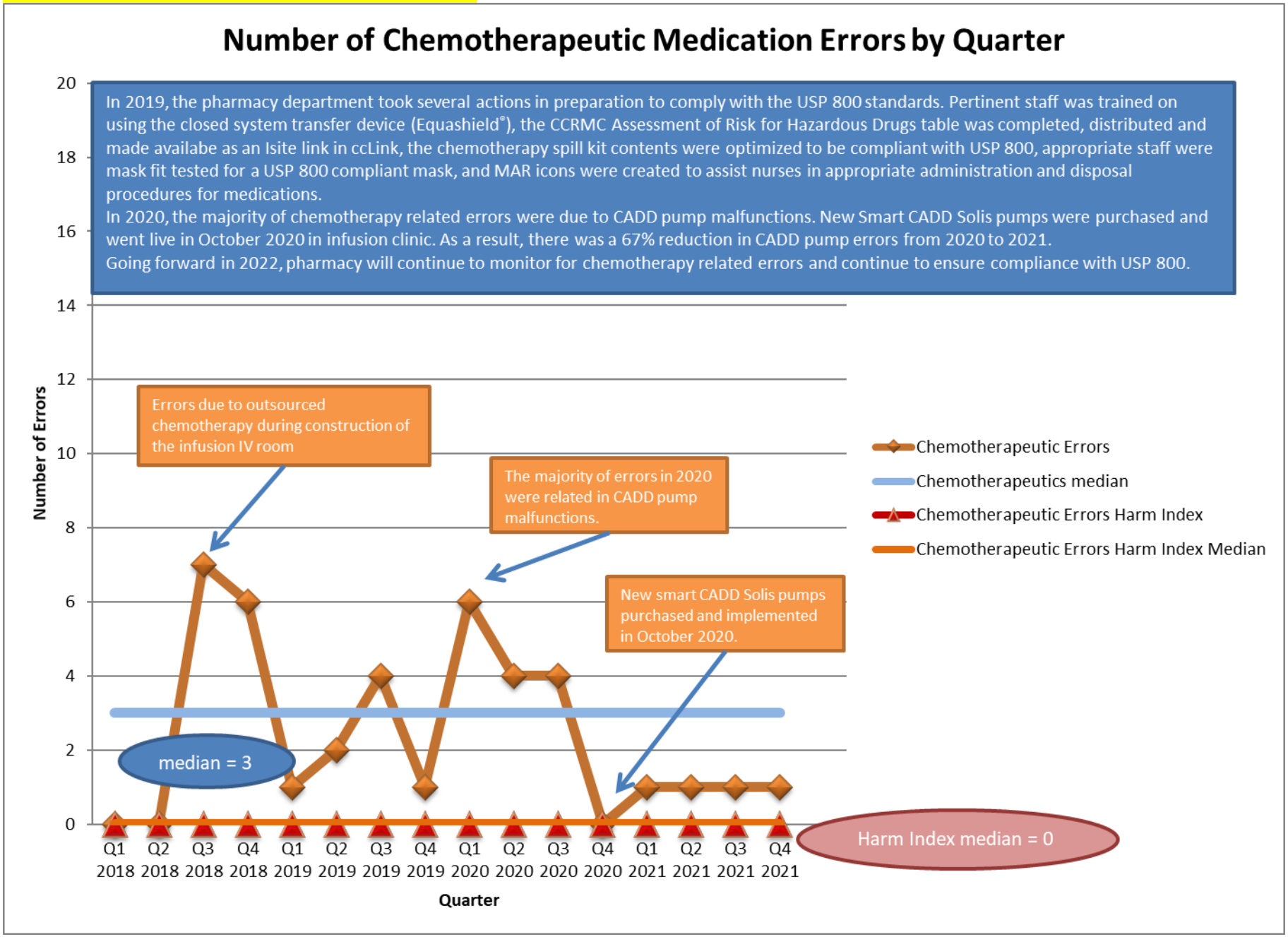


APPENDIX C: HIGH ALERT MEDICATION ERROR GRAPHS



APPENDIX C: HIGH ALERT MEDICATION ERROR GRAPHS



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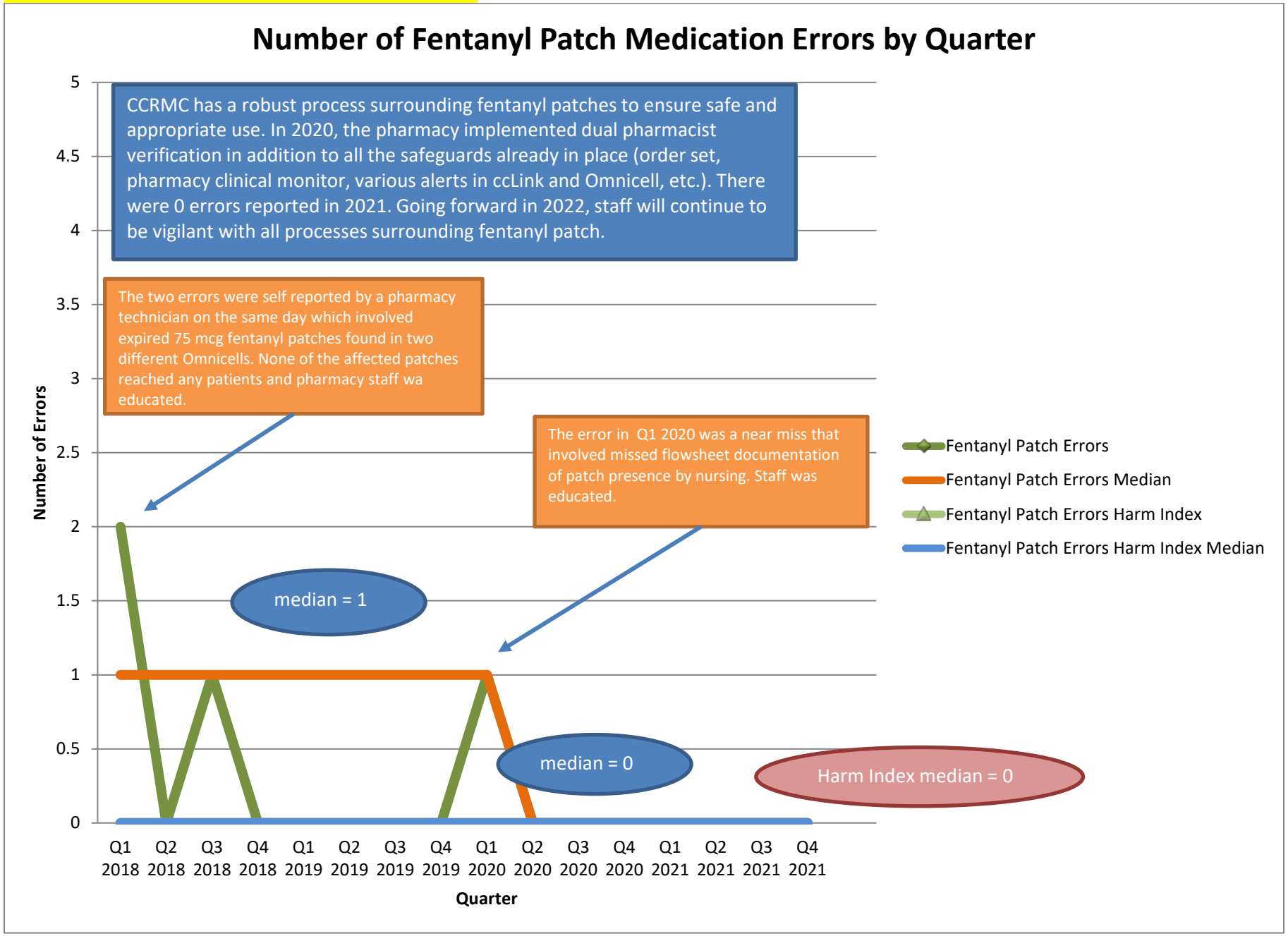
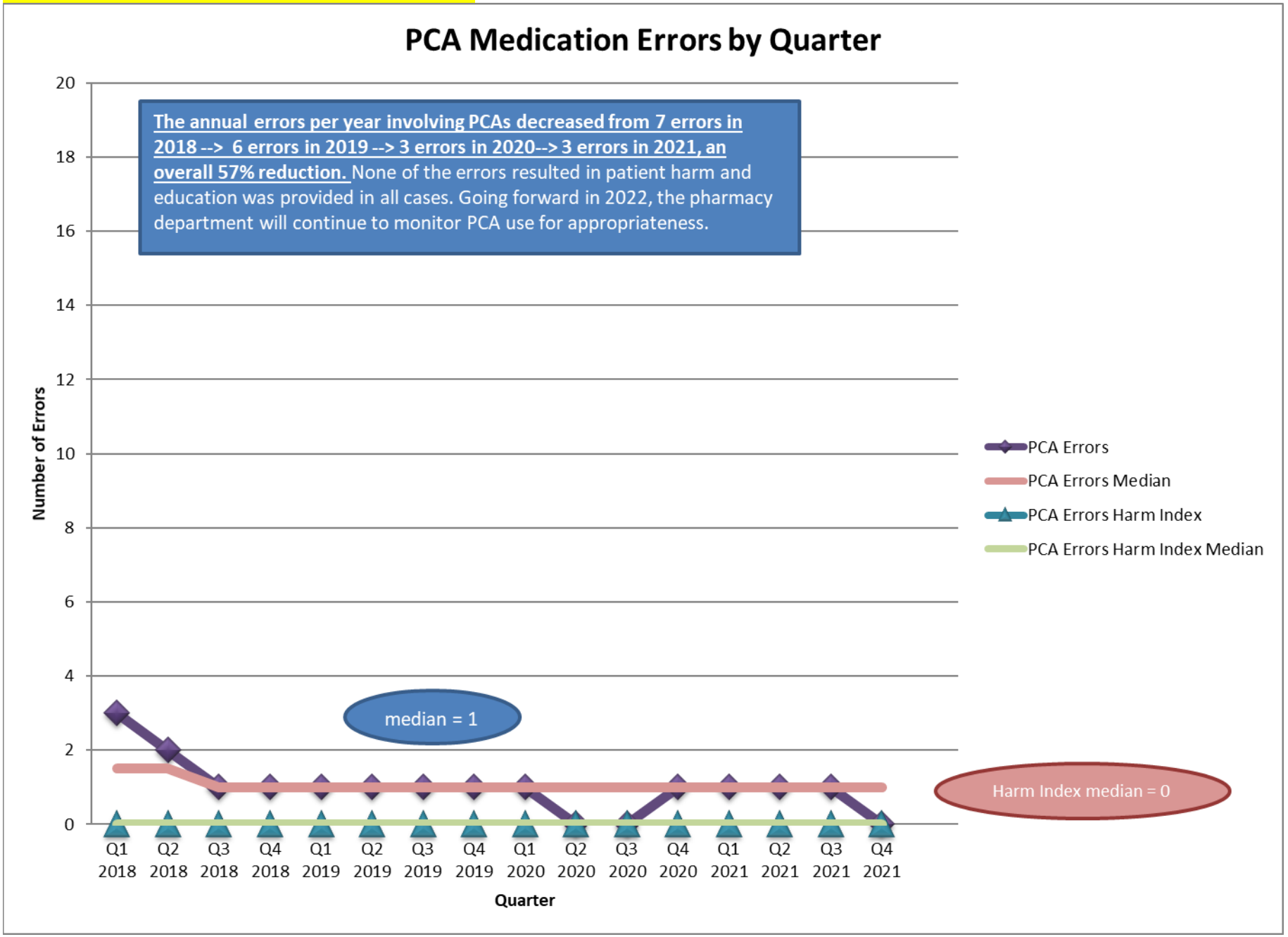
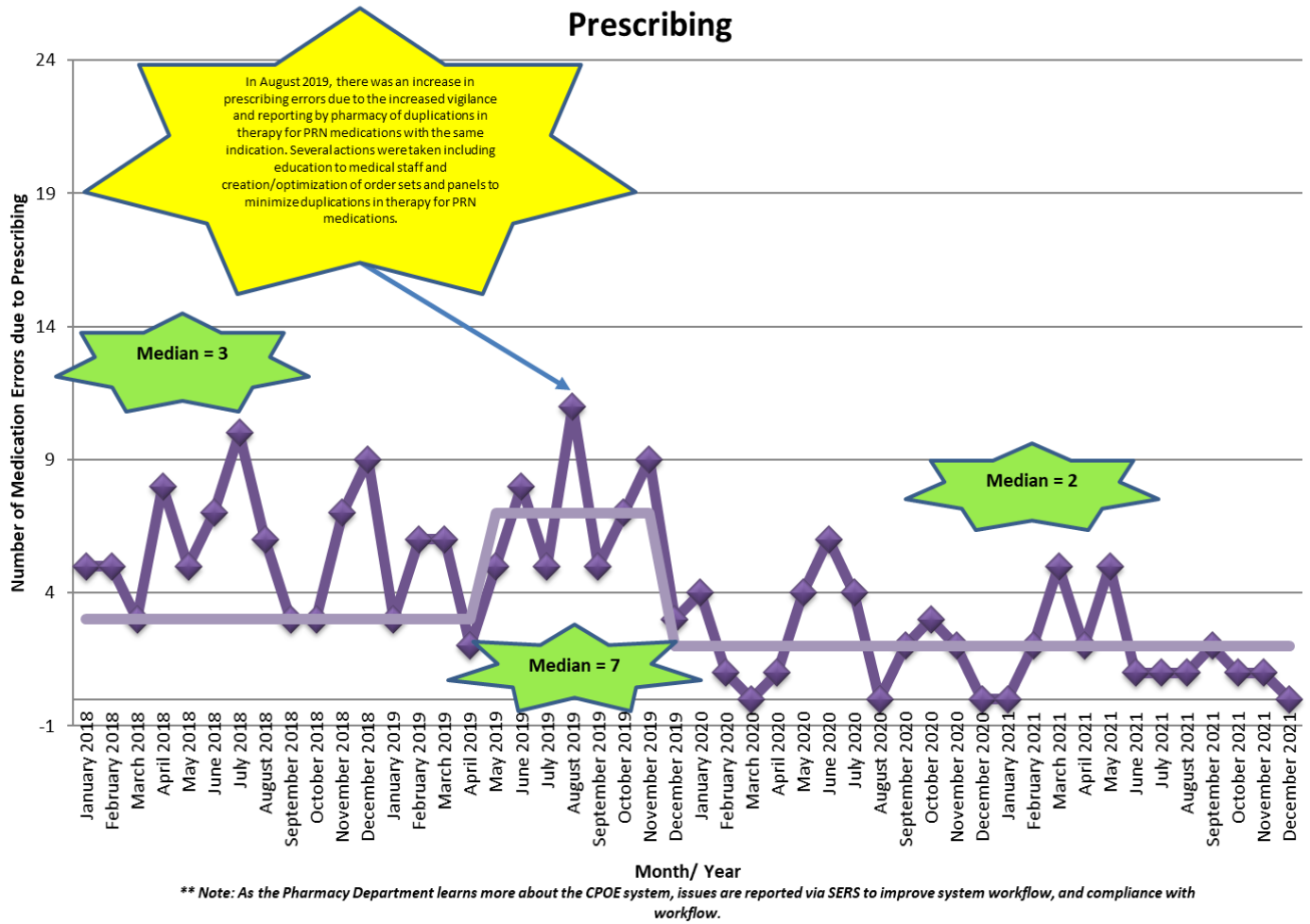


APPENDIX C: HIGH ALERT MEDICATION ERROR GRAPHS



APPENDIX D: MERP ELEMENT GRAPHS



*** Note: As the Pharmacy Department learns more about the CPOE system, issues are reported via SERS to improve system workflow, and compliance with workflow.*

Prescribing by Year:
2018: 73 errors (0.007% error rate)
2019: 70 errors (0.006% error rate)
2020: 26 errors (0.003% error rate)
2021: 21 errors (0.002% error rate)
Looking back since 2019, CCRMC has reduced errors involving overrides, inappropriate insulin management and duplications in therapy.

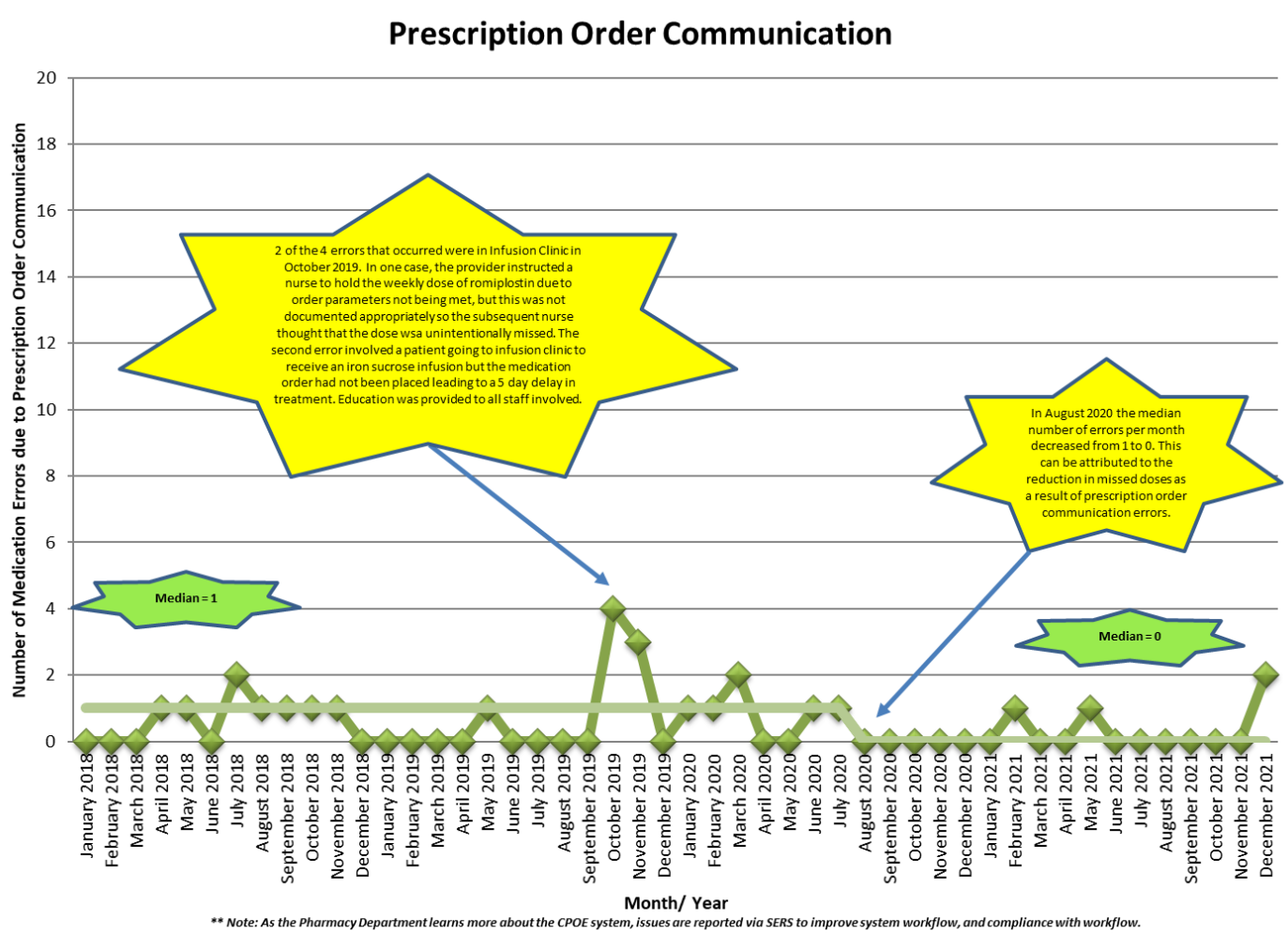
Duplications in therapy:
13 in 2019 → 4 in 2020 → 3 in 2021. Overall, 77% reduction since 2019 due to several efforts made to minimize duplicate PRN medications (order set changes, order panels created, etc.). The pharmacy's increased vigilance led to an increase in reporting of medications with duplicate PRN reasons.

Inappropriate insulin management:
5 in 2019 → in 2020 and 5 in 2021. See the High Alert Section of this SBAR and the Insulin SBAR for more details on specific errors and all actions taken.

Medication prescribed and given too soon
1 in 2019 → 4 in 2020→ 5 in 2021.
The majority of these errors involved acetaminophen being given as a x1 order in the OR or PACU and then the first dose of the scheduled order being given too soon in PACU or on the floor. The pharmacy dept. is working with ccLink to create a BPA to flag the nurse whenever acetaminophen is being administered less than 3 hours after the previous dose.

Looking back in 2021, the median number of prescribing errors per month decreased from 7 errors per month to 2 errors per month starting in December 2019 (a 71% reduction). This is as a result of the improvements seen in reducing the number of overrides (90% reduction since 2018) and reducing duplications in therapy (77% reduction since 2019) via order set changes and order panel creation. In 2021, the error types that peaked involved 1) inappropriate management of patients on insulin (5 errors reported) and 2) medications prescribed and given too soon after a dose had already been given (5 errors reported). Going forward in 2022, the focus will be to continue monitoring the areas above to ensure continued optimization and improvement.

APPENDIX D: MERP ELEMENT GRAPHS



** Note: As the Pharmacy Department learns more about the CPOE system, issues are reported via SERS to improve system workflow, and compliance with workflow.

Prescription Order Communication by Year:

2018: 8 errors (0.0007% error rate)
2019: 8 errors (0.0006% error rate)
2020: 6 errors (0.0006% error rate)
2021: 4 errors (0.0004% error rate)

Looking back since 2018, the percent error rate has been consistently low. The only trend noted was missed doses as a result of a communication error.

Missed/delayed doses due as a result of a communication error:

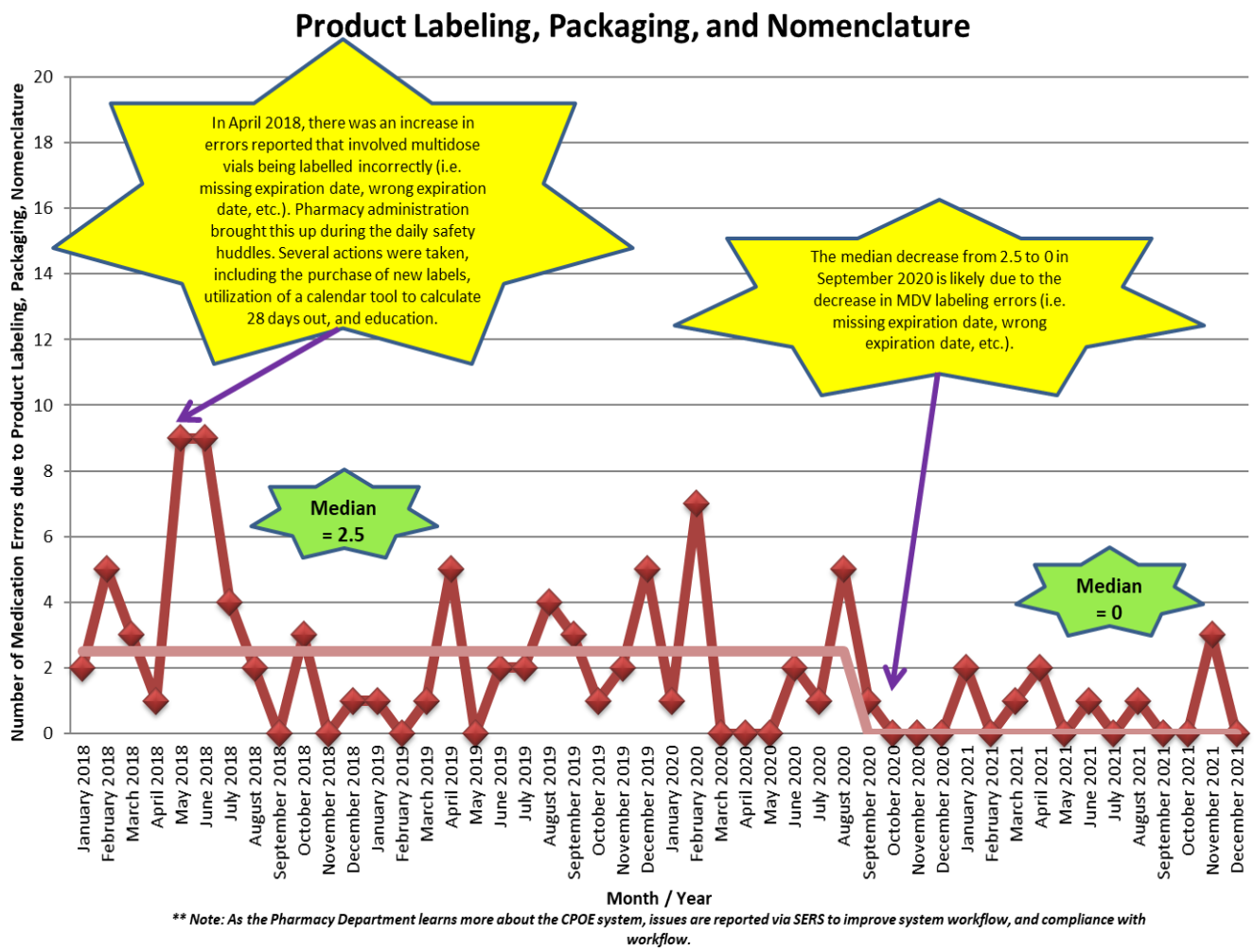
3 in 2019 → 2 in 2020 → 2 in 2021, a 33% improvement since 2019

Order entry error:

2 in 2021 (atropine at bedside order placed as a x1 order instead of a x1 PRN order).

Looking back in 2021, there was a decrease in median from 1 error per month to 0 errors per month starting August 2020. In 2021, there was a 33% improvement in missed doses due as a result of communication error. 2 errors involved the provider placing an order for atropine to be placed at bedside as a "once," order, which resulted in unintentionally medication administration. Pharmacy is working with cardiology and the head of the ICU department to optimize the atropine order to default to "Once PRN" with a PRN reason for HR less than 30 bpm." This PRN reason can be modified if needed. Going forward in 2022, pharmacy will continue to monitor prescription order communication errors for any trends and act accordingly.

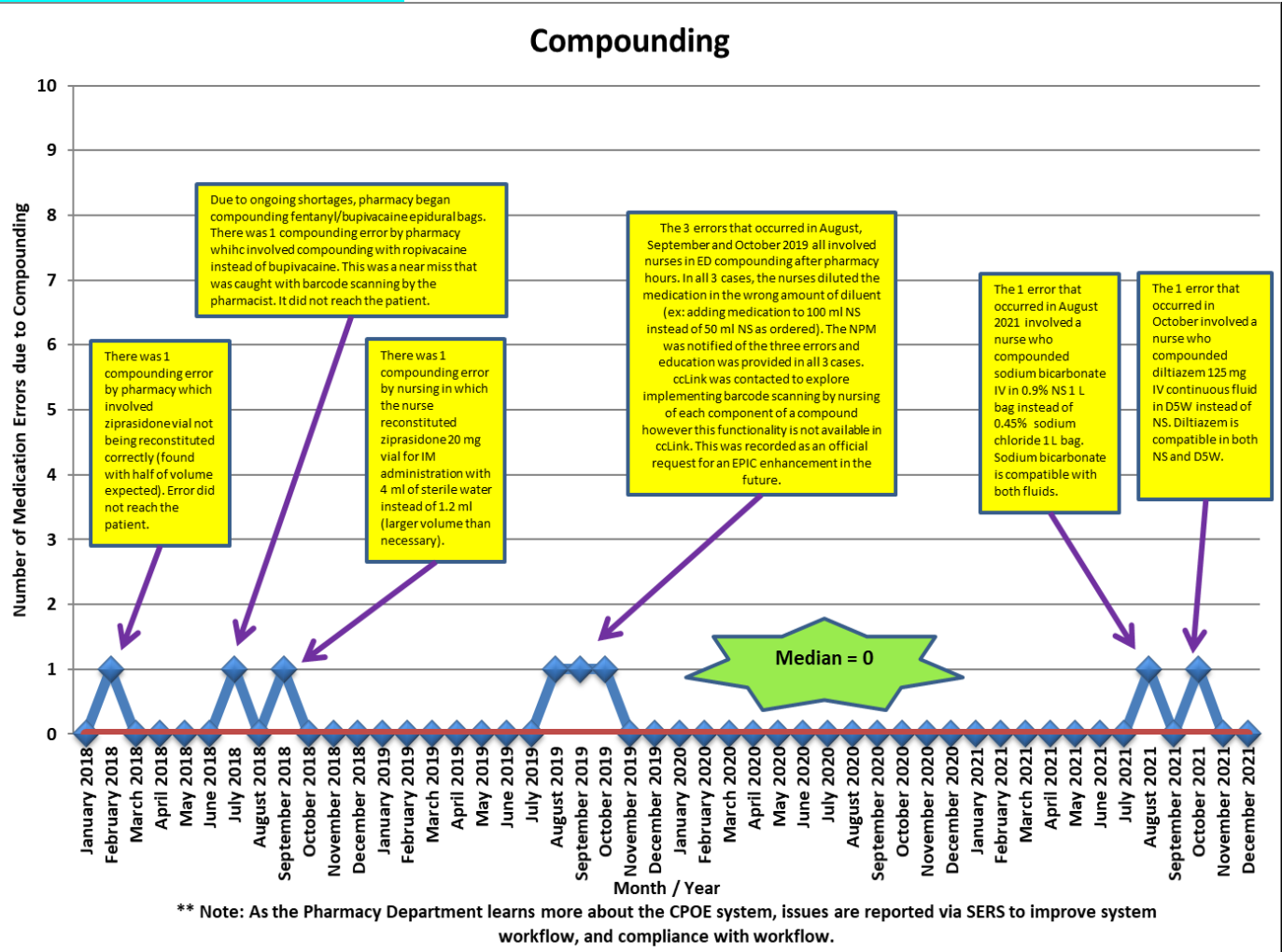
APPENDIX D: MERP ELEMENT GRAPHS



Product Labeling, Packaging and Nomenclature:
2018: 39 errors (0.004% error rate)
2019: 26 errors (0.002% error rate)
2020: 17 errors (0.002% error rate)
2021: 10 errors (0.001% error rate)
Looking back since 2019, the percent error rate has been consistently low. The trends noted are as follows:
MDV expiration labeling errors by nursing:
19 in 2018 → 16 in 2019 → 11 in 2020 → 8 in 2021, an overall 58% reduction. This is as a result of several optimizations made (providing list of Omnicell MDVs on each nursing unit, nursing cycle counts each shift, 28-day calendar tool provided by pharmacy to nursing and nursing education).

Looking back in 2021, the median number of errors per month in product labeling, packaging and nomenclature decreased from 2.5 to 0 starting in September 2020. Further, there was a 58% decrease in MDV expiration labeling errors by nursing compared to 2018. Going forward in 2022, pharmacy will continue to monitor for and report these types of errors. Pharmacy will continue to reinforce cycle counts of the MDVs by nursing and will continue to encourage all pharmacy staff to continue to be vigilant and report any labeling errors.

APPENDIX D: MERP ELEMENT GRAPHS

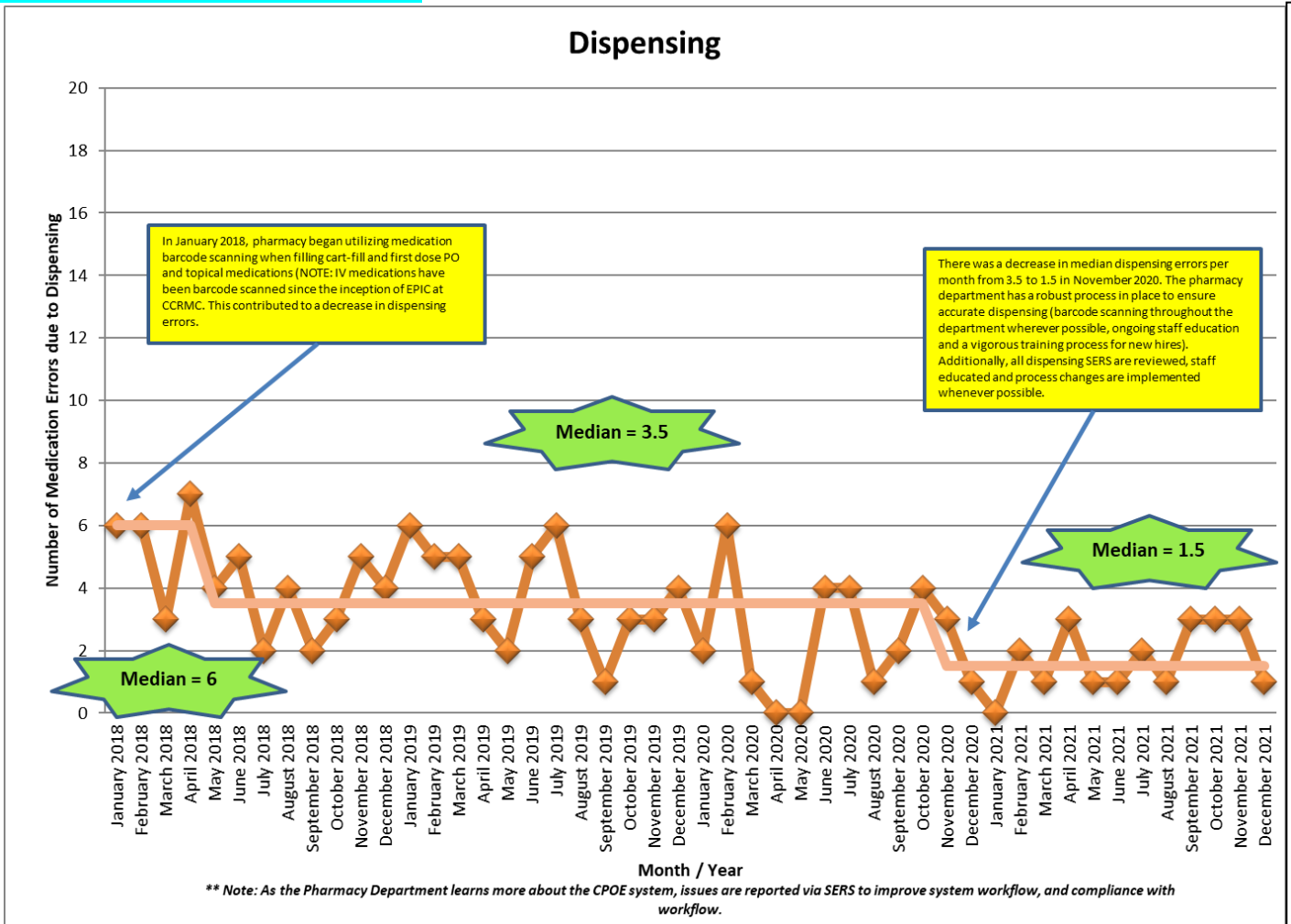


** Note: As the Pharmacy Department learns more about the CPOE system, issues are reported via SERS to improve system workflow, and compliance with workflow.

Compounding:
2018: 3 errors (0.0003% error rate)
2019: 3 errors (0.0002% error rate)
2020: 0 errors (0% error rate)
2021: 2 error (0.0002% error rate)
In 2019, there were 3 errors in which nurses compounded medications after pharmacy hours and compounded the medication in the wrong volume of fluid. All 3 errors happened in the ED and pharmacy reached out to the ED nursing program manager to educate staff.
In 2020, there were no compounding errors reported.
In 2021, there was 2 errors in which nurses compounded the medication in the wrong fluid outside of pharmacy hours. All IV orders specify what fluid the medication is compounded in as part of the order. Also, the drug compatibility chart is available to all nursing staff. Pharmacy reached out to the nursing program manager to educate staff. Additionally in both cases reported, the IV fluid used was also compatible with the medication being admixed.

Looking back in 2021, construction was started in 2020 to change the inpatient pharmacy compounding area from a segregated compounding area to an ante/buffer clean room and was ongoing in 2021. The construction is planned to be completed in 2022. Going forward, pharmacy will continue to monitor for compliance with USP 797 and USP 800 standards via pharmacy audits. In 2021, there was an increase in number of errors from 0 in 2020 to 2 in 2021. These 2 errors were caused by compounding the medication in the wrong fluid by nursing outside of pharmacy hours. Pharmacy reached out to the nursing program manager to educate staff to minimize these errors in the future. Additionally, pharmacy provides an annual IV training for nursing staff and will continue to do so. Going forward in 2022, pharmacy will continue to review and trend any compounding errors.

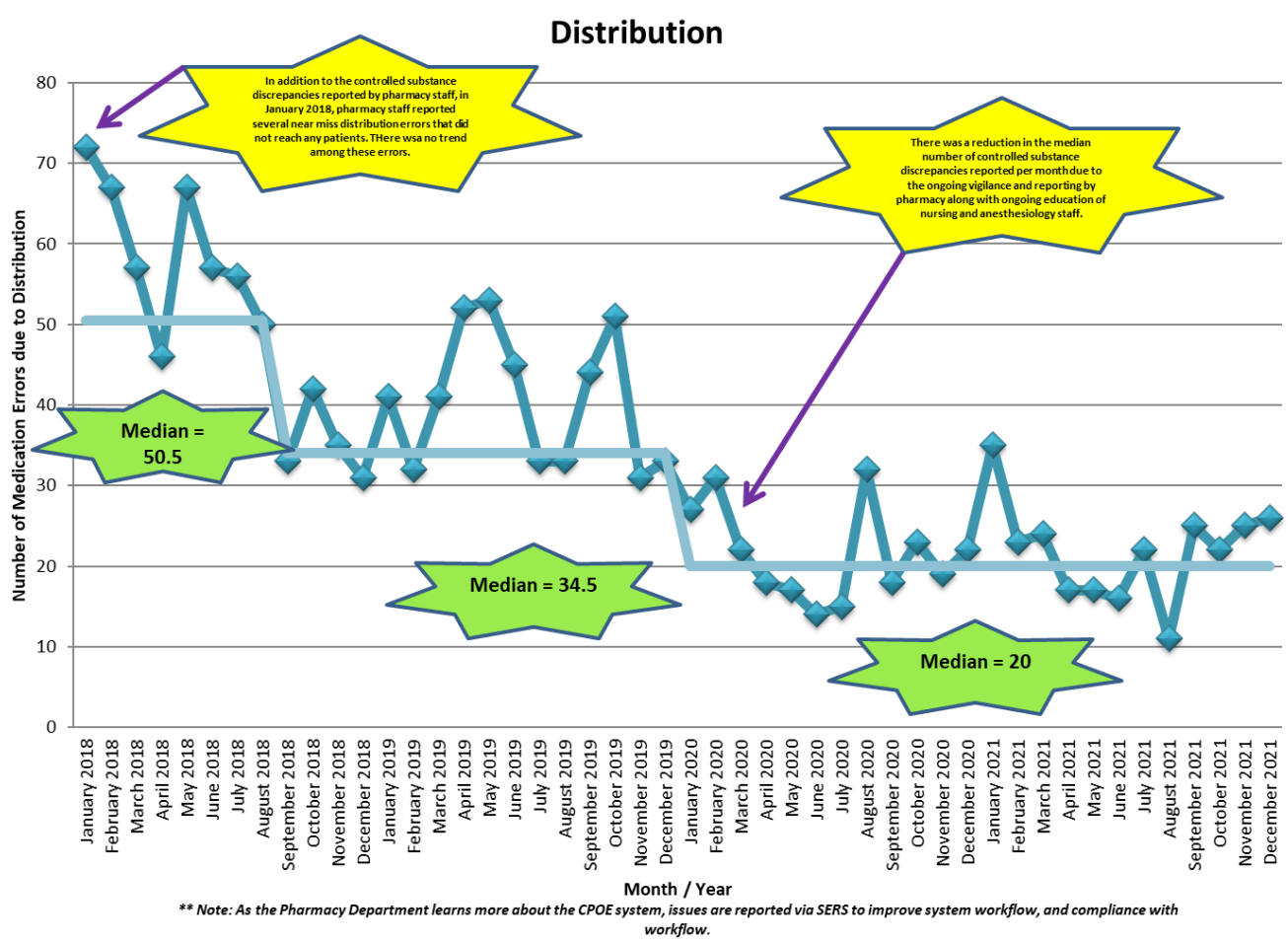
APPENDIX D: MERP ELEMENT GRAPHS



Dispensing:
2018: 52 errors (0.005% error rate)
2019: 46 errors (0.004% error rate)
2020: 28 errors (0.003% error rate)
2021: 21 errors (0.002% error rate)
Looking back since 2019, the percent error rate has been consistently low. The trends noted are as follows:
Wrong dose/strength errors:
11 in 2018 → 13 in 2019 → 3 in 2020 → 6 in 2021. An increase from 2020 but a 54% decrease from 2019. Pharmacy staff was educated to ensure barcode scanning, which could have prevented 2 of the errors in 2021.
Dispensing delays:
3 in 2019 → 2 in 2020 → 3 in 2021. Education was provided in all cases.

Looking back in 2021, the median number of errors per month decreased from 3.5 to 1.5 starting in November 2020 through 2021. There was an increase in number of wrong dose/strength errors from 3 errors in 2020 to 6 errors in 2021, however this was still lower than 13 errors in 2019 (an overall 54% decrease). It is important to note that barcode scanning was bypassed in 2 of the cases in 2021, which could have prevented those two errors. The pharmacists involved were educated. Pharmacy staff was also educated in regards to the dispensing delay errors.
The pharmacy department has a robust process in place to ensure accurate dispensing (barcode scanning throughout the department wherever possible, ongoing staff education and a vigorous training process for new hires). Additionally all dispensing errors are discussed with staff and process changes are implemented whenever possible. Going forward in 2022, the pharmacy department will work with ccLink to initiate barcode scanning in the Willow Ambulatory environment (this is in addition to the other areas of the pharmacy that already have barcode scanning enabled).

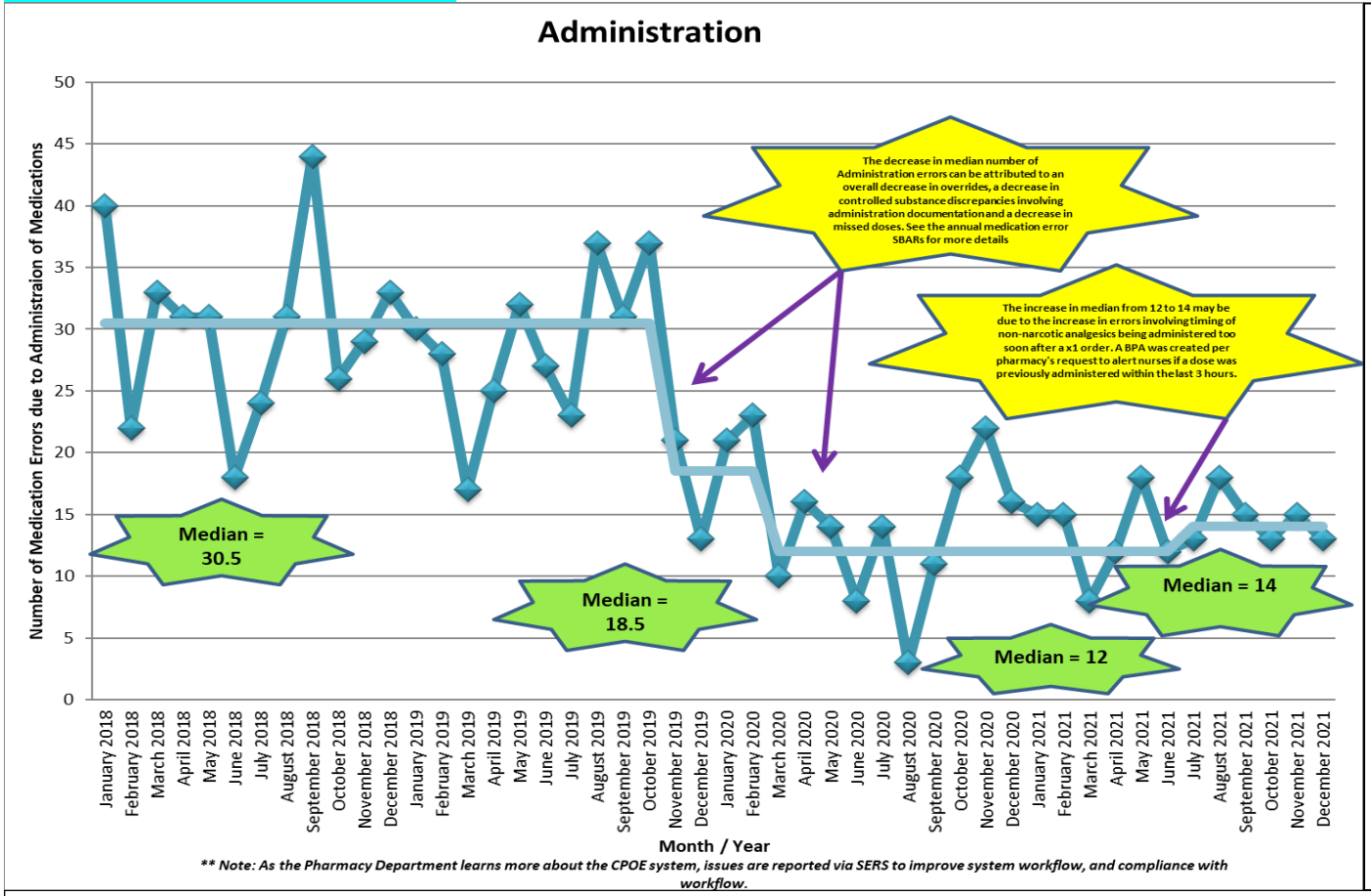
APPENDIX D: MERP ELEMENT GRAPHS



Distribution:
2018: 615 errors (0.056% error rate)
2019: 490 errors (0.039% error rate)
2020: 257 errors (0.026% error rate)
2021: 268 errors (0.024% error rate)
Looking back, there was a decrease in median from 34.5 to 20 errors per month starting January 2020 through 2021. The increase in number of errors from 257 in 2020 to 268 in 2021 is due to an increase in the number of controlled substances discrepancies. Pharmacy is working closely with nursing leadership.
Controlled substance discrepancies:
486 in 2018 → 386 in 2019 → 193 in 2020 → 218 in 2021 (55% reduction since 2018)
See the "medication errors by drug class- controlled substance" section for an in-depth review of controlled substance monitoring and corrective actions.
Issues surrounding Omnicell:
25 in 2018 → 21 in 2019 → 13 in 2020 → 18 in 2021 (28% reduction since 2019). There is an ongoing education of pharmacy staff to ensure accurate filling of Omnicell bins. Note that there is a technological limitation of Omnicell that only allows barcode scanning of the first dose being added to the Omnicell, instead of each dose.
MDV expiration labeling errors by nursing:
21 in 2018 → 19 in 2019 → 11 in 2020 → 8 in 2021, an overall 58% reduction due to the ongoing efforts by pharmacy and nursing to reduce these errors (education, MDV cycle counts by nursing, 28-day calendar tool).

Looking back in 2021, there was a decrease in median from 34.5 to 20 errors per month starting in January 2020. There was a 55% reduction in controlled substance discrepancies since 2018 and a 62% reduction in MDV expiration labeling errors by nursing since 2018 along with the 28% reduction in issues surrounding Omnicell since 2018. Although there was an increase in number of narcotic discrepancy errors from 2020 to 2021, the overall reduction in number of controlled substance discrepancies since 2018 is due to the ongoing monitoring and reporting of controlled substance discrepancies on a daily basis by pharmacy along with a task being added to the task list for OR and L&D OR in January 2020 for nurses to ensure that the anesthesiologists complete post case dose reconciliation prior to closing the case. In 2020, CCRMC was recognized in the Cal Hospital Opioid Care Honor Roll as one of the 25 hospitals ranked in the "superior performance." Going forward in 2022, pharmacy will continue to monitor and report controlled substance discrepancies. Going forward in 2022, pharmacy will complete the conversion of G4 Omnicells to XT (allows for better patient data security, higher narcotic security with metal locking bins rather than plastic, and Omnidispensers instead of coils which will cause less jams and are more space efficient/ increase capacity). The multidisciplinary Opioid Stewardship Committee will continue to meet on a quarterly note to review guidelines and regulations, and optimize pain management strategies at CCRMC.

APPENDIX D: MERP ELEMENT GRAPHS

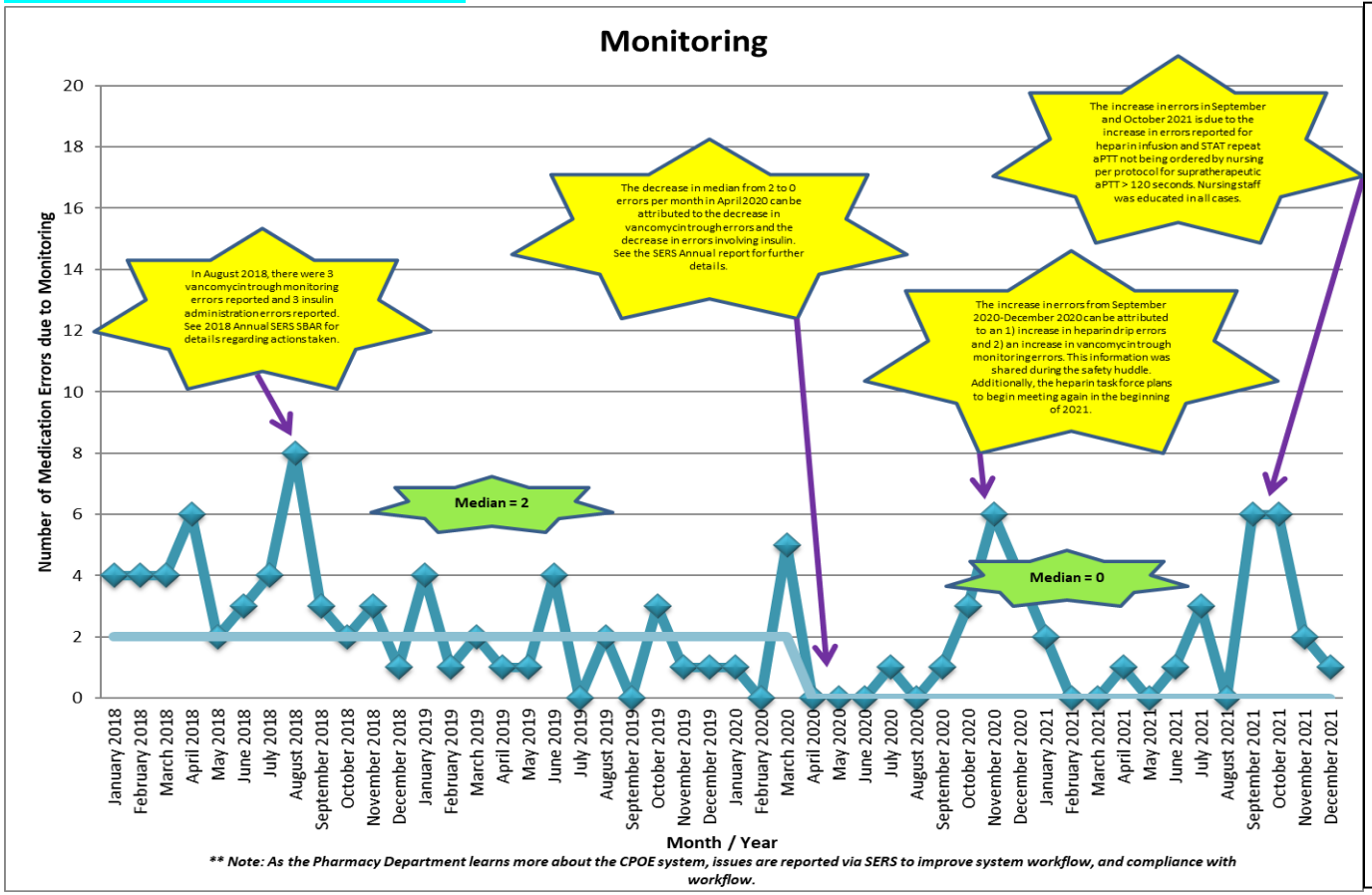


Administration:
2018: 352 errors (0.032% error rate)
2019: 299 errors (0.023% error rate)
2020: 161 errors (0.017% error rate)
2021: 150 errors (0.014% error rate)
Trends noted are as follows.
Overrides:
87 in 2018 → 72 in 2019 → 32 in 2020 → 24 in 2021, an overall 72% reduction.
Missed doses:
47 in 2018 → 51 in 2019 → 25 in 2020 → 36 in 2021, an overall 23% reduction.
Missed doses due to clamp errors:
14 in 2018 → 14 in 2019 → 8 in 2020 → 8 in 2021, an overall 43% reduction.
Wrong dose/rate/concentration/time/ frequency:
15 in 2019 → 22 in 2020 → 29 in 2021. The increase in 2021 may be due to the increase in errors involving timing of non-narcotic analgesics being administered too soon after a x 1 order (8 cases involving acetaminophen and 1 involving ketorolac).

Looking back in 2021, there was a 57% reduction in number of errors since 2019. The top error types that peaked were override errors, missed dose errors and errors caused by wrong dose/rate/concentration/frequency/time. While these errors were the top error types, the override errors had overall reductions of 72% since 2018 and the missed dose errors had 43% reduction due to ongoing efforts by the organization. There was an increase in wrong time errors in which acetaminophen or ketorolac second dose was administered too soon after a x1 dose was administered in the OR or PACU. A BPA is in the process of being created to alert nurses if a dose had been administered less than 3 hours prior to help prevent this error type. Going forward in 2022, pharmacy will continue to monitor and trend any similar errors.

Going forward in 2022, pharmacy will continue to monitor overrides for any trends and work with NPMs to resolve any issues. See the annual overrides SBAR for more details. There are several processes in place from previous years that have contributed to the downtrend of clamp errors and maintaining a low number of errors (i.e. audits by pharmacy and nursing, education by the professional development department alert in Alaris pump, etc.). Going forward in 2022, the Alaris infusion pumps will be updates to alarm for unclamped secondary infusions which was a previously unavailable feature. This is planned to go live in the beginning of 2022. The Medication Safety Committee will continue to monitor and trend these types of errors.

APPENDIX D: MERP ELEMENT GRAPHS



Monitoring:
2018: 44 errors (0.004% error rate)
2019: 23 errors (0.001% error rate)
2020: 24 errors (0.002 % error rate)
2021: 21 errors (0.002 % error rate)
In 2021, the median number of errors continued to be 0 per month since April of 2020. Trends noted are as follows.

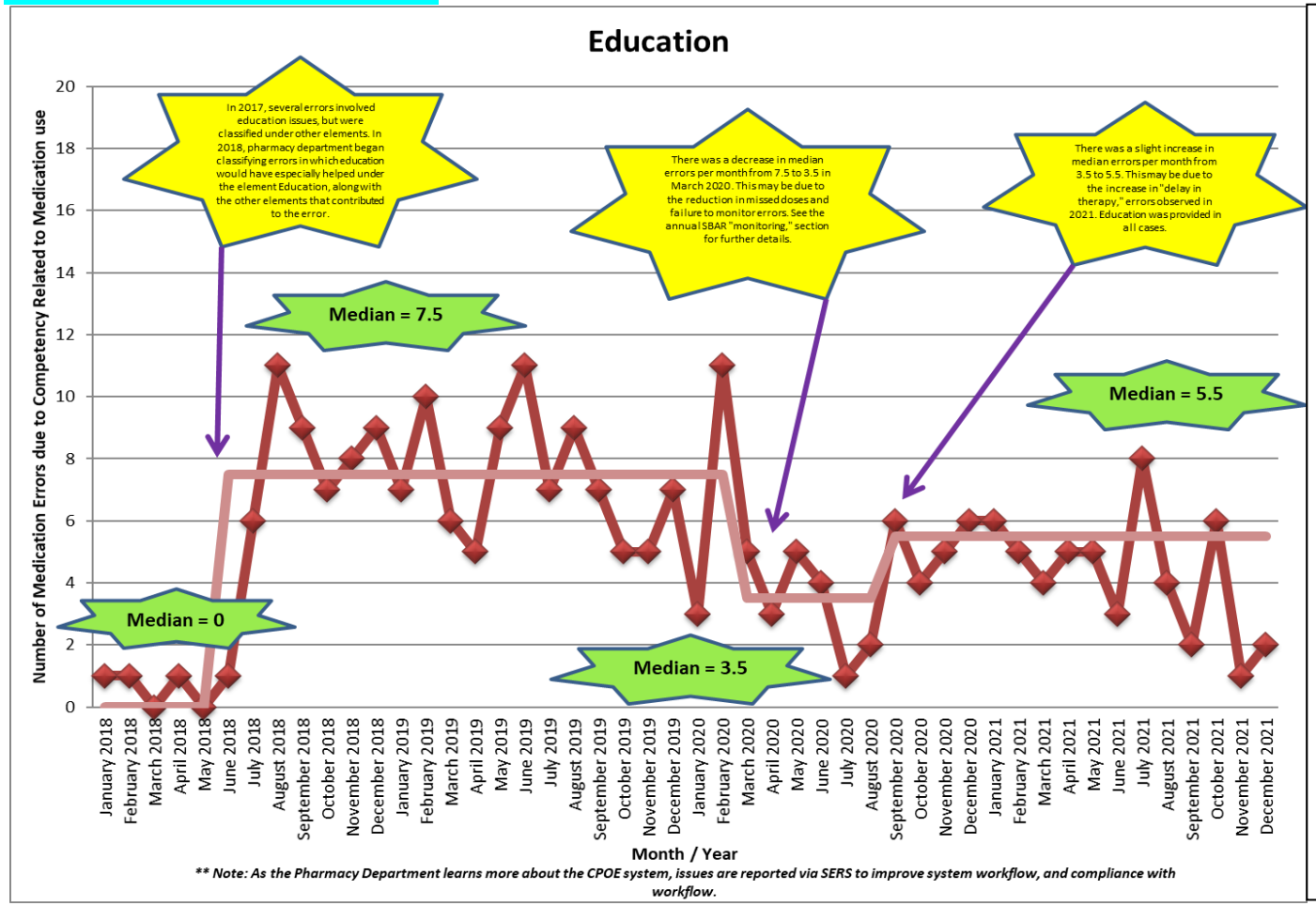
Heparin infusion errors:
13 in 2018 → 10 in 2019 → 5 in 2020 → 11 in 2021. While the number of errors increased from 2020 to 2021, the percent of errors (# of heparin errors/ days of therapy) only slightly increased from 3.8% in 2020 to 4% in 2021.

Vancomycin trough errors:
15 in 2018 → 9 in 2019 → 9 in 2020 → 6 in 2021, an overall 60% reduction.

Insulin errors:
7 in 2018 → 1 in 2019 → 1 in 2020 → 1 in 2021, an overall 86% reduction.

There was a decrease in the median number of errors per month from 2 to 0 starting in April 2020 through 2021. In 2021, there was a 60% reduction in number of vancomycin trough errors from 2018 to 2021. In order to further reduce vancomycin trough errors, a BPA was created per the request of pharmacy to alert nurses of a trough order within 2 hours of the vancomycin due time. While there was an increase in heparin infusion errors from 2020 to 2021, there was also an increase in patient days of heparin (160 days in 2020 vs. 297 days in 2020). When looking at the number of errors over the patient days, there was a 3.8% error rate in 2020 and a slight increase up to 4% in 2021. The slight increase may be due to a new error type identified in 2021 (missed STAT repeat aPTT order by nursing for aPTT > 120 seconds). Nursing staff was educated and reminded to order the STAT repeat aPTT per protocol. See the "High Alert- Anticoagulation" section for further details of actions taken. Going forward in 2022, pharmacy will continue to address these errors, emphasize education and work with ccLink IT to optimize the protocol. Dual Sign off has been added to all heparin administrations, which previously was only available for 'Initial Infusion' in January 2021. Additionally, the calculator format was updated to make the "initial dose" and "subsequent dose" sections stand out more on the MAR.
More so, there was an 86% reduction in number of insulin related errors from 2018 to 2021. The decrease in insulin related errors can be attributed to the several actions taken by the multidisciplinary insulin task force since its inception in 2018. See the "high alert" section of this SBAR and the Insulin SBAR for more details.

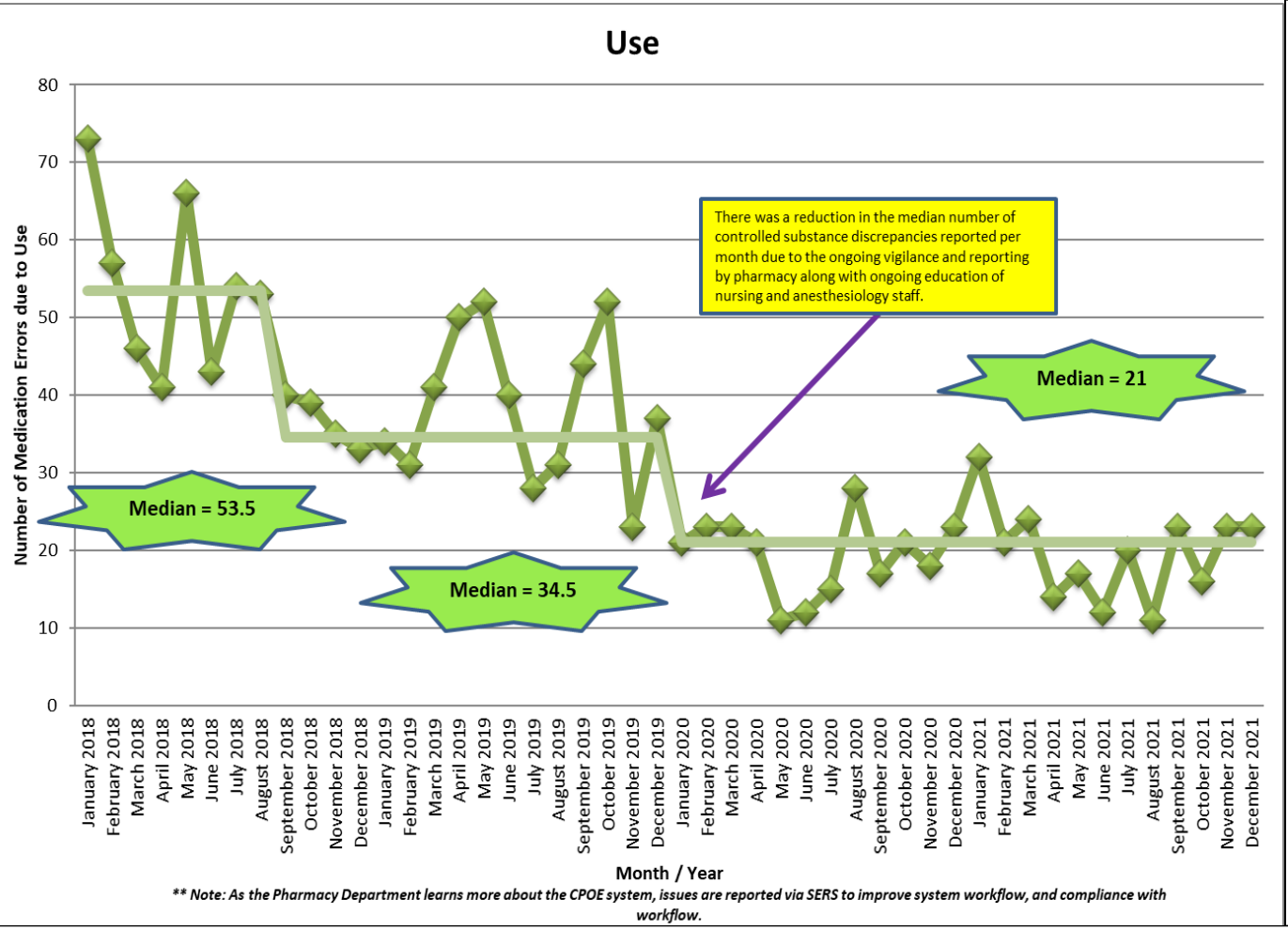
APPENDIX D: MERP ELEMENT GRAPHS



Education:
2018: 55 errors (0.005% error rate)
2019: 87 errors (0.007% error rate)
2020: 55 errors (0.006 % error rate)
2021: 51 errors (0.005 % error rate)
Trends noted are as follows.
Delays in therapy:
6 in 2018 → 5 in 2019 → 4 in 2020 → 7 in 2021
Failure to monitor:
5 in 2018 → 8 in 2019 → 2 in 2020 → 4 in 2021
Missed doses:
3 in 2018 → 5 in 2019 → 6 in 2020 → 2 in 2021

Looking back in 2021, the median number of errors per month was stable at 5.5 errors. The top error types were delays in therapy and failure to monitor. 2 of the 7 delays involved delays in Kcentra administration. Going forward in 2022, pharmacy will provide educational materials for the professional development department to educate nursing staff on Kcentra administration in order to help prevent delays in the future. There was no harm to either patient who had Kcentra ordered. There was a 50% decrease in failure to monitor errors from 2019 to 2021 (see "monitoring" section for details), and a 60% decrease in missed doses (see "administration," section for further details). Looking back in 2021, there were several educational efforts that took place including but not limited to 1) education for pharmacy staff on soaking medication cart and spraying medication package with alcohol spray upon return to pharmacy, 2) education to nursing staff on discarding medications from COVID patient rooms. Going forward in 2022, education will be provided to nurses on the following and other items as deemed necessary- 1) the IV compatibility chart, 2) waste management in the inpatient and ambulatory settings, 3) education to nurses when dispense tracking is implemented
The majority of education errors are also classified under the other elements that apply to the error and are further discussed and trended under those elements. Going forward in 2022, pharmacy will continue to work with nursing leadership and the Professional Development Department to promote ongoing education.

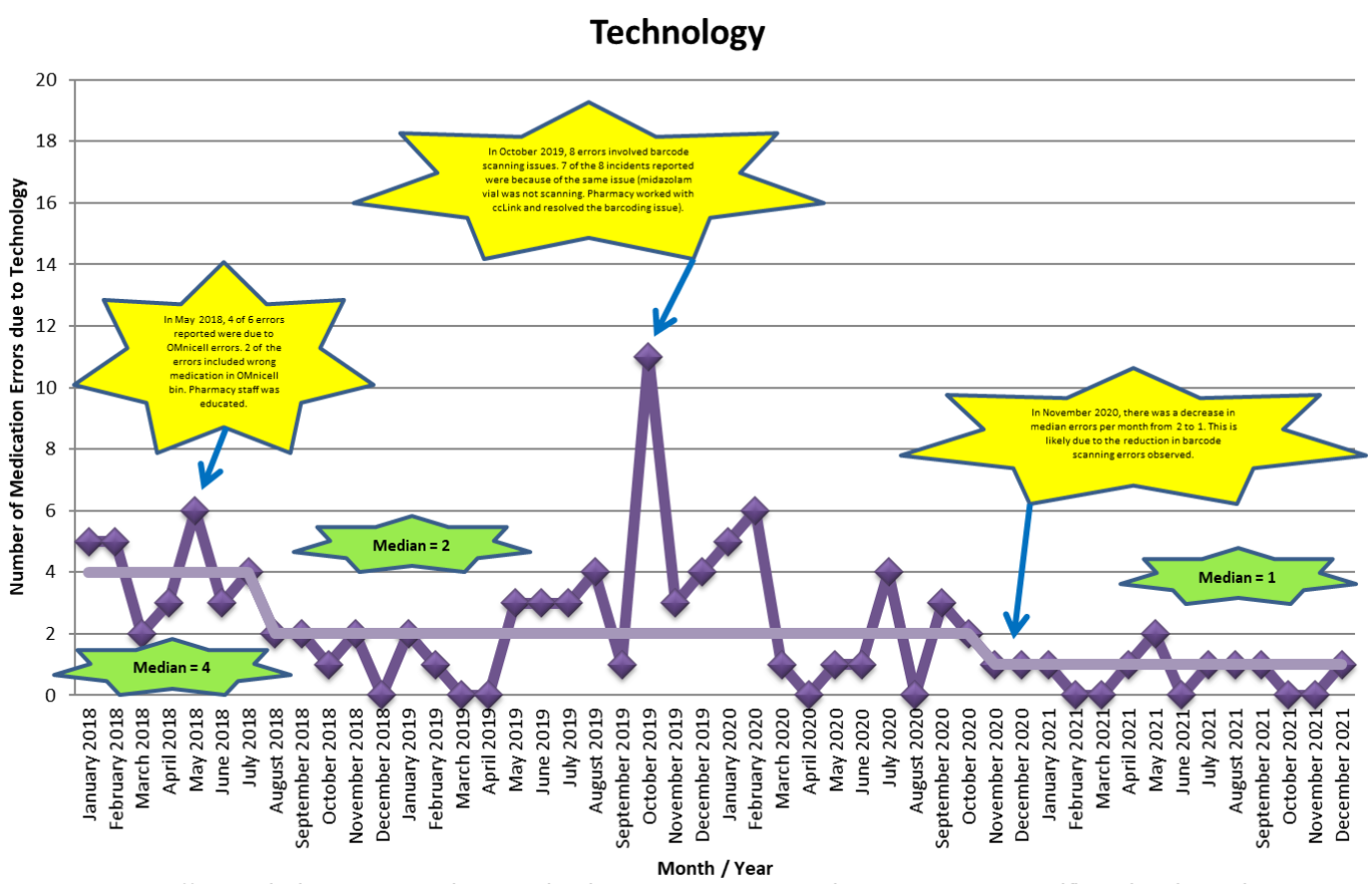
APPENDIX D: MERP ELEMENT GRAPHS



Use:
2018: 582 errors (0.053% error rate)
2019: 460 errors (0.036% error rate)
2020: 233 errors (0.024 % error rate)
2021: 236 errors (0.021 % error rate)
Looking back in 2020, the median number of errors decreased from 34.5 per month to 21 per month starting in January 2020. Trends noted are as follows. The increase in number of errors from 233 in 2020 to 236 in 2021 is due to increase in number of controlled substances dispenses. Pharmacy is working closely with nursing leadership and nursing program manager.
Controlled substance discrepancies:
486 in 2018 → 386 in 2019 → 193 in 2020 → 218 in 2021 (55% improvement since 2018)

Looking back in 2021, there was a decrease in the median errors per month from 34.5 to 21 starting in January 2020 and remained the same through 2021. There was an overall 55% decrease in controlled substance discrepancies since 2018. The reduction in controlled substance discrepancies is due to the ongoing monitoring and reporting of controlled substance discrepancies on a daily basis by pharmacy along with a new task being added to the task list for OR and L&D OR in January 2020 for nurses to ensure that the anesthesiologists complete post case dose reconciliation prior to closing the case.
In 2020, CCRMC was recognized in the Cal Hospital Opioid Care Honor Roll as one of the 25 hospitals ranked in the "superior performance."
Going forward in 2021, pharmacy will continue to monitor and report controlled substance discrepancies. The multidisciplinary Opioid Stewardship Committee will continue to meet on a quarterly note to review guidelines and regulations and optimize pain management strategies at CCRMC.

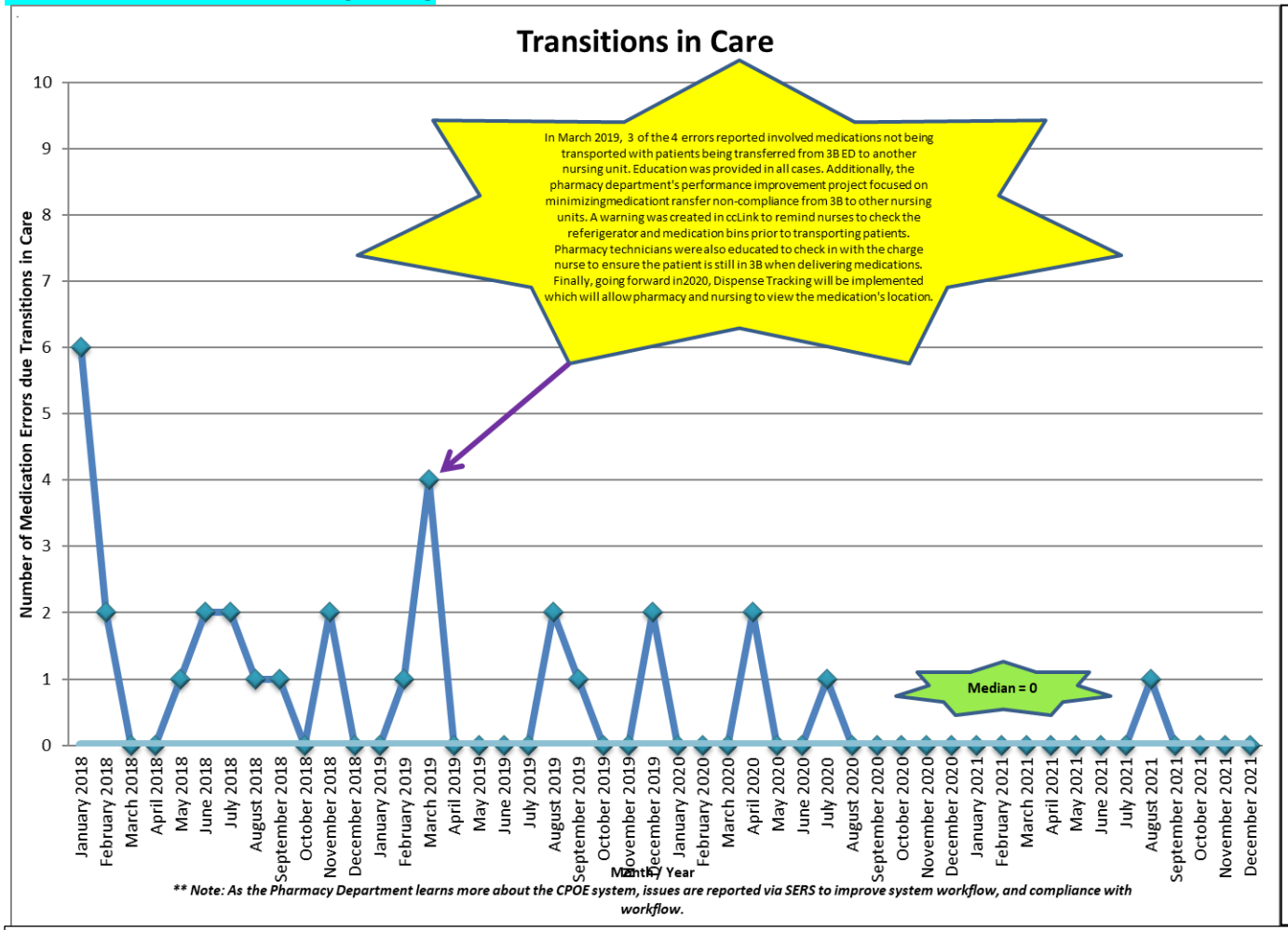
APPENDIX D: MERP ELEMENT GRAPHS



Technology:
2018: 36 errors (0.003% error rate)
2019: 31 errors (0.002% error rate)
2020: 25 errors (0.0.003 % error rate)
2021: 8 errors (0.001 % error rate)
Looking back since 2019, the percent error rate has been consistently low. The trends noted are as follows:
Errors involving Omnicell:
12 in 2018 → 4 in 2019 → 5 in 2020 → 2 in 2021
Barcode scanning:
2 in 2018 → 10 in 2019 → 0 in 2020 → 0 in 2021
IV pump issues:
1 in 2018 (Alaris) →5 in 2019 (3 Alaris, 2 CADD) → 7 in 2020 (all CADD) → 4 in 2021 (2 Alaris, 2 CADD)

Looking back in 2021, there was a 83% decrease in errors involving Omnicell since 2018 due to ongoing education of pharmacy staff. Also, the barcode scanning errors continued to be 0 in 2021 as a result of technological fixes and education of pharmacy and nursing staff.
In 2021, there was a decrease in CADD pump malfunctioning errors from 7 in 2020 to 2 in 2021 in infusion clinic (71% improvement). In October 2020, new smart CADD Solis pumps were purchased for infusion clinic and went live. Pharmacy will continue to trend CADD pump data and report findings to the Medication Safety Committee.
Going forward in 2022, pharmacy will complete the conversion of G4 Omnicells to XT (allows for better patient data security, higher narcotic security with metal locking bins rather than plastic, and Omnidispensers instead of coils which will cause less jams and are more space efficient/ increase capacity). Pharmacy will continue to trend and monitor technological errors.

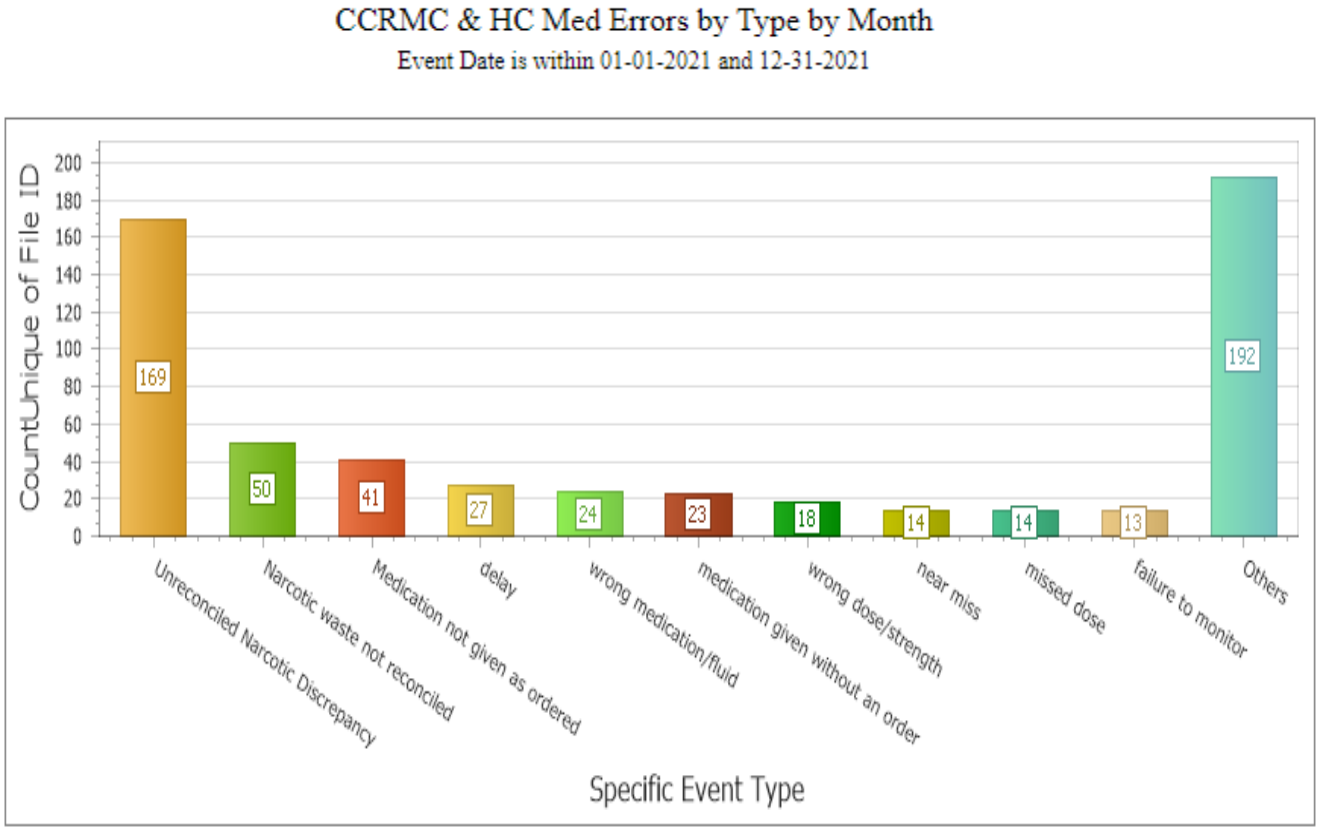
APPENDIX D: MERP ELEMENT GRAPHS



Transitions in Care:
2018: 17 errors (0.002% error rate)
2019: 10 errors (0.0008% error rate)
2020: 3 errors (0.0001% error rate)
2021: 1 error (0.0001% error rate)
Looking back since 2018, the percent error rate has been consistently low. The trends noted are as follows:
Errors involving patient transfer within the hospital from one unit to the next:
5 errors in 2018 → 9 errors in 2019 → 2 errors in 2020 → 1 error in 2021.

Looking back in 2021, there was an 88% decline in errors from 2019 to 2021 involving patient transfer within the hospital from one unit to the next. The pharmacy department's performance improvement project was to deliver medications to patients in a timely manner and improve pharmacy operations by reducing unnecessary in-basket messages. Upon investigation, it was found that the top reason for in-basket messages was for missing doses. With further analysis, it was found that one of the top two contributing factors to missing doses was non-compliant medication transfer events (i.e., medications already dispensed from pharmacy not being transferred with patient from one unit to the next). In 2020, pharmacy and nursing focused on educating staff which contributed to the decline in errors reported. Simultaneously, in 2021, pharmacy explored utilizing a dispense tracking system to help with locating missing doses that have already been dispensed. Going forward in 2022, the pharmacy department will work with ccLink IT to pilot the dispense tracking system.

APPENDIX E- MEDICATION ERRORS BY TYPE



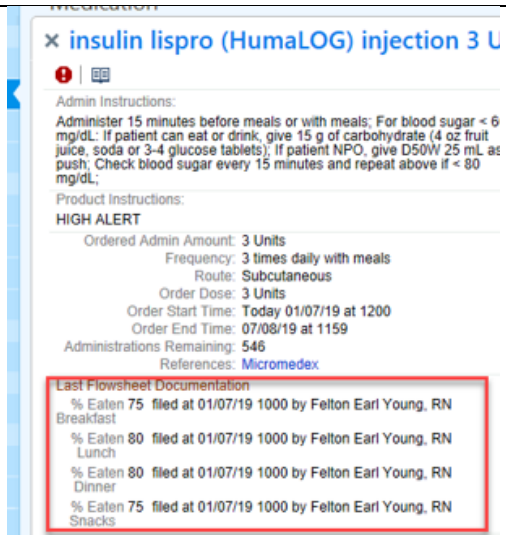
SUPPLEMENT

DETAILED DOCUMENTS

CCRMC TIMELINE OF EFFORTS MADE TO REDUCE SEVERE HYPOGLYCEMIA (BG≤ 50 MG/DL)

Date	Action Taken	Status
October 2017	As a result of multiple level E events in one patient, the plan of correction was to create a BPA, which went into effect in October 2017. The BPA reminds physicians to reduce the insulin dose in the scenario if all of the following is true: 1) patient has had more than one day in the hospital. 2) Diet order changed from non-NPO to NPO. 3) On long-acting insulin or insulin infusion. If all 3 are true, POP-UP will alert the physician to consider decreasing the insulin regimen.	Completed
February 2018	The pre-checked dextrose fluid for patients who become NPO in the SubQ insulin order sets was unchecked and hidden due to a technological glitch in the programming. This was fixed in February 2018.	Completed
March 2018	The BPA regarding NPO status was not coded correctly and was programmed to not fire within 24 hours of patient being in the ED (including boarder patients who may be in the ED for longer than 24 hours). BPA was updated to fire for ED boarder patients in March 2018.	Completed
March 2018	Administration instructions were added to scheduled mealtime insulin in March 2018: *"If scheduled mealtime insulin already administered and patient does not eat, check BG 30 minutes after insulin administration."*	Completed
March 2018	Updated BG goals were added to the SubQ insulin order sets in March 2018, consistent with ADA Diabetes Care Guidelines. *Goal blood glucose is 140-180 mg/dL for non-pregnant adult inpatients.* *More stringent goal blood glucose (110-140 mg/dL) may be appropriate for selected patients if this can be achieved without significant hypoglycemia.*	Completed

March 2018	Conducted DUE for SubQ insulin and severe hypoglycemia ≤50 mg/dl. Continued to do so and findings shared with multidisciplinary insulin taskforce	Ongoing
June 2018	Vigilanz activation for pharmacy for insulin and BG ≤ 70 mg/dl was activated by June 2018.	Completed
July 2018	SQ insulin sidebar report was made and is available for inpatient nurses in July 2018.	Completed
September 2018	Multidisciplinary meetings to begin in the 4th Quarter 2018 in order to continue to address the issues surrounding insulin and hypoglycemia.	Completed
October 2018	New system list created for nutrition dept. for any patient on insulin (previously had a list of patients on long-acting insulin only). This was completed in October 2018.	Completed
November 2018	PRN fluid changed from D5W to D5NS per request of medical staff and admin instruction changed from for NPO patients with BG < 250 mg/dl, to start upon patient becoming NPO. This was completed in November 2018.	Completed
November 2018	Hyperkalemia treatment- Insulin +D50 order panel created, which includes POCT BG checks before administration, then hourly after administration x 6 hours. This was completed in November 2018.	Completed
January 2019	5D Pilot project to improve percent eaten documentation initiated	Completed
January 2019	Multidisciplinary meeting to explore barcoding meal trays to help with amount eaten documentation	Not started due to technological limitations with EPIC
January 2019	MAR updated to allow RN to view previous % eaten documentation under insulin order in the administration screen	Completed January 2019

		
January 2019	Drug utilization evaluation of insulin and BG ≤ 50 mg/dl conducted, and findings shared with multidisciplinary insulin committee	Completed
February 2019	Physician oversight/QA process initiated in February 2019 for any patients with severe hypoglycemia	
February 2019	RN education plan to educate nurses to administer rapid acting insulin with first bite of meal (0-15 minutes before eating).	
February 2019	SubQ insulin guideline sidebar to be updated to include specific instructions and to match MAR administration instructions.	Finalized in May 2019
February 2019	SubQ insulin administration instructions updated	Finalized in May 2019
February 2019	Vigilanz alerts for BG < 70 mg/dl to 5D charge nurses and certain providers	
February 2019	Requested PRN POCT BG Q6 Hours while NPO order to be placed into the SubQ insulin order sets	Completed
March 2019	Hypoglycemia smart phrase created so that physician oversight/QA process could be standardized with plan to start running reports on this.	Smart phrase was created.
March 2019	NPO for diabetic order panels (including dextrose fluid and POCT BG Q6 hours) were built out.	Completed
March 2019	eLearning for providers regarding insulin management	Completed in May 2019
March 2019	Charge nurses requested to have option in EPIC to add a column for POCT BG orders to their system list.	Completed
March 2019	New Vigilanz alerts for pharmacists: - Incremental BG decline New BPA for providers for SCr > 1.5 mg/dl and BG < 110 mg/dl	Completed
April 2019	Nourishment room updates- PARs of certain food items increased based on need of each nursing unit to ensure that snacks are available for diabetic patients at all times.	Completed
May 2019	Update SubQ insulin order sets to include a whole separate section for NPO patients (with Q6 hour correctional dose insulin).	Completed
May 2019	Informational BPA to provider if patient has NPO status ordered but has TID AC/HS correctional dose lispro or vice versa	Completed
December 2019	Haiku alert for BG < 80 mg/dl to doctor first contact went into production	Completed

December 2019	Ensure that all pre-procedure order sets have a dextrose containing fluid and hypoglycemia protocol for diabetic patients	Completed
June 2020	The Hyperkalemia panel (insulin + D50 + POCT BG checks) was made searchable with the term “insulin,” in ccLink.	Completed
December 2020	Removal of single IV regular insulin order in the ED medications preference list. Instead make a mini panel with POCT BG checks post administration	Completed
January 2021	Work with L&D to optimize the C-section order set by adding a dextrose containing fluid and POCT BG checks	Completed
April 2021	Create an NPO diabetic system list for each nursing unit and for pharmacy	Completed
April 2021	Create a BPA for NPO diabetic patients without a dextrose fluid on board and another BPA for nurses to start the dextrose fluid upon pt becoming NPO	In process
April 2021	Add glucose tablets to formulary and hypoglycemia protocol	Complete
June 2021	Create a SubQ insulin order set for pregnant patients, not in peripartum	Completed
June 2021	Work with L&D to optimize the Type 1 and Type 2/gestation intrapartum and post-partum order sets	In process
August 2021	Dextrose fluid and POCT BG checks added to the C-section pre-op order set for any patients who have a history of taking medications for diabetes.	Complete
August 2021	Dextrose fluid and POCT BG checks added to the Surgery pre-op order sets for any patients who have a history of taking medications for diabetes. OP Gen Surgery Pre-Perioperative Orders (3041000508) OP GYN Pre-Perioperative Orders (30410000999) OP Orthopedic Surgery Pre-Perioperative Orders (3041000509)	Complete

Heparin Infusion Multidisciplinary Task Force Action Taken	Date
Heparin Multidisciplinary task force began meeting.	June 2018
Heparin Infusion PDSA initiated in 3D.	June 2018
Administration instructions on MAR updated to be clearer, along with heparin Sidebar table.	August 2018
"Heparin aPTT," lab order created, to differentiate aPTT results for patients on heparin infusion. With this new lab, all results are considered "critical," which prompts a phone call from lab to nurse caring for patient or charge nurse regarding aPTT result.	January 2019
Isite report enhanced to track heparin aPTT lab orders (time of order, time of result, time of MAR action)	January 2019
Heparin activity report created so that nursing could easily view past actions taken in regard to heparin infusion.	January 2019
BPA to direct nurse to order the correct lab "aPTT Heparin," for patients on heparin infusion.	February 2019
Heparin infusion calculator built and in production.	Request was made in October 2019, testing started in March 2019 and implementation occurred on July 30th 2019
Administration instructions "DO NOT REBOLUS AFTER A HOLD" are already in the heparin infusion medication order, however these instructions were not in the bolus order. The instructions were added to the bolus order.	September 2020
Errors were submitted to the nursing educators to educate nurses on heparin drip, including how to use the heparin calculator and to remind nurses to always use the calculator.	September 2020
Heparin Task Force to begin meeting again to address the issues surrounding heparin drip.	Restarted in 2021 and ongoing
Dual sign-off was added to all heparin administrations, previously was available for "initial infusion."	January 2021
Heparin calculator text on MAR updated: The "initial dose" and "subsequent titrations" were updated to stand out more on the MAR to promote nursing use of the correct section at the right time	April 2021
Nursing order and side bar report verbiage updated: "DO NOT WAIT FOR BASELINE APTT RESULT to Start heparin infusion. If baseline aPTT is greater than 50 seconds, notify MD."	April 2021

Action Taken to prevent therapeutic duplication of PRN medications	Date Completed
'"Post-Anesthesia Orders": Post-anesthesia order set contained PRN orders for fentanyl, morphine and hydromorphone with the same indication based on patient's pain score. To prevent duplication of PRN orders with the same indication, the post-anesthesia order set was revised to include instructions for the nurse as to which opioids is to be given first, second and third. The ordering provider must choose the opioid to be given as first, second and third choice at the time of ordering. This will provide clear instructions for the nurse how to administer the 3 PRN opioids medications ordered for pain management.	Q1, 2018
Ticket 424475- Acetaminophen PO/IV order panels. Administration instructions were added.	7/1/2019
Ticket 424756- Constipation medications order panel and antiemetic medications order panel created. All single order medications in these panels removed from orderable in EPIC.	7/1/2019
Email sent to RXe-Source regarding therapeutic duplication of PRN orders.	7/6/2019 and again on 8/1/2019
CIWA order set with multiple lorazepam PRN orders with same indication. Administration instructions were added to clarify when to give which order of lorazepam.	7/8/2019
Ticket 425262- Acetaminophen PO/Rectal order panel removed from order sets.	7/8/2019
Memo from Pharmacy director distributed to medical staff regarding prevention of therapeutic duplication of PRN medications. Director of Pharmacy also met with residents with the support of the residency director to discuss this issue.	7/16/2019 & 8/5/2019
Ticket 428004-Post-partum C-section order set constipation section was updated to have clear instructions.	7/17/2019
Ticket 428321- Promethazine IM/PO/Gel. IM route was removed. Administration instructions were added to the gel and the PO tablet to provider instructions to nurse to initiate therapy with topical and then switch to PO if topical ineffective.	7/23/2019
Meetings with Chair of the psychiatry department and nurse program manager. Plan to optimize order sets to eliminate duplicate PRN medications.	Meeting on 8/1/19 and 8/8/19
Ticket 429490- Hydrocodone/APAP and oxycodone/APAP orders in ccLink had an option to use for mild pain (1-3). This option was removed so that these would only be used for moderate/ severe pain and promote use of non-narcotic options for mild pain. This also prevents duplication of therapy between analgesics.	8/7/2019
Pharmacy department also requested a new I-vent category to be created ("Duplication of PRN reason"). Going forward, interventions will be documented under the new I-vent category. Additionally, SERS are submitted for errors found, and variance reports are also submitted to RXe-Source pharmacy to ensure education of all staff involved.	8/15/19

Analysis of Medication Errors- 2021:

- Top medication classes involved in medication errors
- Medication errors by severity Level
- High alert medication errors
- Trend of MERP elements
- Summary of actions taken

MEDICATION ERRORS BY DRUG CLASS:

Below are the medication classes that have persistently caused the highest number of medication errors per year:

CONTROLLED SUBSTANCES

DATA HIGHLIGHTS:

250 errors involved controlled substances (0.26% of total controlled substance transactions in 2021) vs 229 (0.22%) in 2020, 449 (0.36%) in 2019, and 558 (0.4%) in 2018.
202/250 (81%) of errors did not reach the patient (Level B and lower), and only 1/250 errors caused harm and 99.6.% of errors did not cause harm (Level E and lower).

TRENDS NOTED:

- The #1 error type reported in 2021 was related to controlled substance discrepancies, which is consistent with 2020, and 2019. There was a 55% reduction in controlled substance discrepancies in 2021 compared to 2018 (218 discrepancies in 2021, 193 discrepancies in 2020, 386 discrepancies in 2019 and 486 discrepancies in 2018).
- There were 218 controlled substance discrepancies reported in 2021 (0.23%), 218/96,205 of controlled substance transactions in Omnicell, an increase from 193 (0.18%) in 2020, a reduction from 386 (0.32%) in 2019 and a reduction from 486 (0.36%) in 2018.
    - The breakdown of the different controlled substance discrepancy types are as follows:
        - "Unreconciled Narcotic Discrepancy" (n=163 discrepancies/96,205 controlled substance transactions= 0.17% in 2021 vs. 0.18% in 2020, vs. 0.25% in 2019, and 0.29% in 2018)
        - " Narcotic waste not reconciled" (n=50 (n= 27 discrepancies/96,205 controlled substance transactions= 0.05% in 2021, vs. 0.03% in 2020, 0.07% in 2019, and 0.06% in 2018)
        - "Missing narcotic from Pharmacy return bin" (n=0 discrepancies/106,454 controlled substance transactions=0% in 2021, vs. 0% in 2020, vs. 0.0008% in 2019 and 0% in 2018)
        - "Cycle count errors" (n = 0 discrepancies/96,205 controlled substance transactions= 0% in 2021, vs.0% in 2020 vs. 0% in 2019 and 0.003% in 2018.
- There was no trend among the other errors involving controlled substances.

MAIN ACTIONS TAKEN:

- The pharmacy department monitors and reports controlled substance discrepancies on a daily basis as a quality assurance measure.
- With the California Code of Regulations, title 16, section 1715.65, the pharmacy department implemented a quarterly inventory count for all Schedule II medications at CCRMC in 2018. This report includes any discrepancies noted with comments and explanations as needed. This is in addition to the monthly inventory Omnicell report and oversight of controlled substance transactions.

- The multidisciplinary Opioid Stewardship Committee was created in 2016 and continues to meet on a quarterly note to review guidelines and regulations and optimize pain management strategies at CCRMC. The committee works to ensure the quality and safety of care provided at CCRMC. In 2020, CCRMC was recognized in the Cal Hospital Opioid Care Honor Roll as one of 25 hospitals ranked in the "superior performance." For a comprehensive overview of actions taken, see the "controlled substance and pain" SBAR.

ANTIMICROBIALS

DATA HIGHLIGHTS:

42 antimicrobial order-related errors (0.07%) in 2021, vs. 57 errors (0.09%) in 2020, 75 errors (0.07%) in 2019 and 101 errors (0.08% in 2018. 42/42 (100%) of errors did not cause harm (Level D and lower), vs. 56/57 (98%) in 2020, 75/75 (100%) in 2019 and 98/101 (98%) in 2018.

TRENDS NOTED:

- Breaking down the errors by event type, the top 3 event types were as follows:
  - The main cause of antimicrobial errors overall was missed doses 18/38 (47%) vs. 20/57 (35%) in 2020, 25/75 (33%) in 2019, and 23/101 (23%) in 2018. Though the percentages have increased, the total number of missed dose errors have decreased from 2019 to 2021. In 2021, the following trends could be noted:
    - TREND: 7/18 (39%) of missed dose errors involving antimicrobials were due to incorrect tubing connections/nursing forgetting to unclamp the secondary line, a reduction from 8/20 (40%) in 2020 14/25 (56%) in 2019, 15/23 (65% in 2018).
      - A breakdown by nursing unit reveals 3 in 4B, 1 in 3D, 1 in 3E, 1 in 4A, and 1 in 5A.
      - A breakdown by nursing shift reveals 4 during PM shift, 2 during day shift and 1 during night shift.
    - TREND: 3/18 (17%) of missed dose errors involved Add-Vantage medications not being activated prior to administration, an increase from 0% in 2020 4% in 2019, 9% in 2018
      - A breakdown by nursing unit reveals 2 from 5A and 1 from 3D.
      - There were no trends in regard to nursing shift or time of day.
  - Issues with vancomycin trough monitoring accounted for 4/42 errors (10%), vs 8/57 errors (14%) in 2020, 9/75 errors (12%) in 2019, 15/101 (15%) in 2018.
  - Prescribing errors accounted for 6/38 (16%) in 2021 but was not noted to be a top error in the past years.
    - TREND: 3/6 (50%) of prescribing errors were made by medical residents, and all providers involved were individually educated on their errors.
      - A breakdown by unit reveals 2 in 3B and 1 in 3E
      - A breakdown by time of day reveals that all 3 errors were made in the night and PM shifts.
    - TREND: 2/6 (33%) were made by pharmacists dosing vancomycin per protocol and one of the pharmacists was a new hire. The pharmacists involved were educated.

MAIN ACTIONS TAKEN:

- Regarding the nurses forgetting to unclamp the secondary line, there are several processes in place from previous years which had previously contributed to the downtrend of clamp errors and maintaining a low number of errors, including monthly feedback provided from Pharmacy to Nursing leadership, Nursing Program Managers and the Department of Quality , pharmacy department audits of medication administration, nursing audits of medication administration, and education by the professional development department for orienting nurses. The number of clamp errors in 2021 was lower than 2020, 2019 and 2018 as noted above.

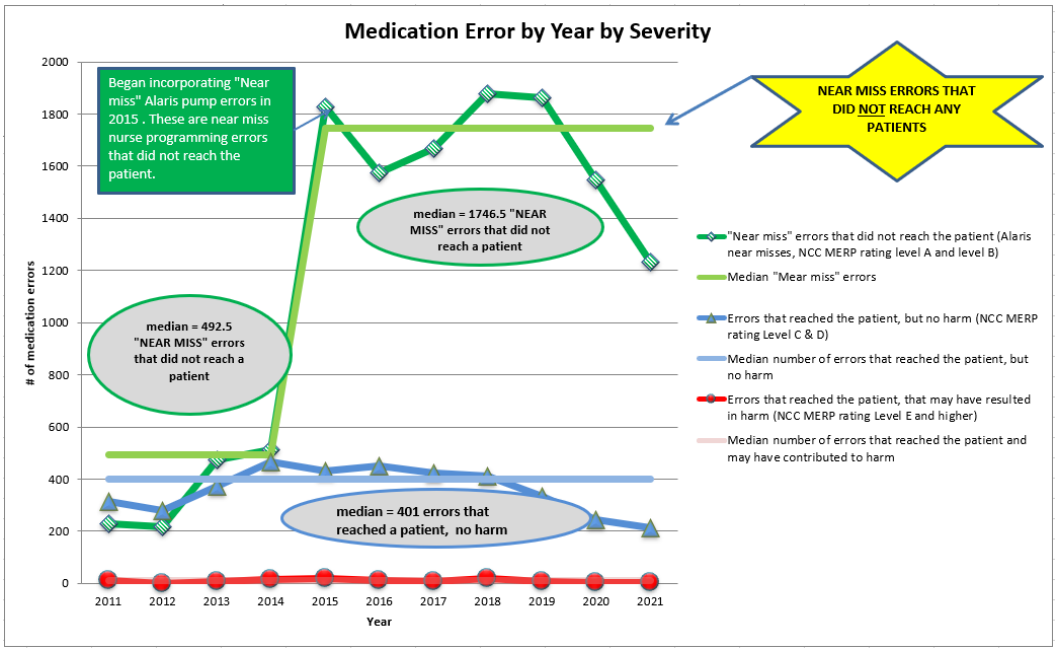
- In regard to the IV medication not being activated when dose is being administered, nurses are educated during the IV admixture training to ensure the IVs are activated when hanging doses. Additionally, since 2013, pharmacy worked with ccLink to create additional reminders on medication labels for nurses to activate all Add-vantage medications prior to administration.
- In 2021, there were 4 vancomycin trough monitoring errors, vs. 8 in 2020, 9 in 2019 and 15 in 2018 showing an overall decrease.
- Several actions have also been taken over the past several years in an effort to ensure appropriate vancomycin trough monitoring.
    - In 2018, the vancomycin trough monitoring issues were discussed during one of the organization's safety huddles to educate staff and minimize this type of error.
    - In 2021, pharmacy department worked with ccLink to optimize the vancomycin trough monitoring communication process with nursing staff to reduce missed vancomycin trough errors.
    - Pharmacy continues to educate nursing staff regarding the vancomycin trough monitoring process upon hire, during the nursing orientation.
    - Pharmacy continues to educate new pharmacist hires on the pharmacy vancomycin dosing protocol. New hires also take a baseline competency test and a post-training competency test to ensure adequate understanding of CCRMC monitoring protocols, including the vancomycin monitoring protocol. In addition, pharmacy continues to update and optimize orientation and training materials to minimize such errors in the future.
- CCRMC has had a robust Antimicrobial Stewardship Program (ASP) in place through the Pharmacy Dept for years. A Formal ASP committee and team was formed in early 2015 and meets quarterly. A pharmacist and ID physician meet daily to conduct a stewardship review of select patients and make recommendations when appropriate. The acceptance rate of interventions is monitored and trended. Additionally, the committee reviews antibiotic usage trends, and conducts further drug utilization evaluations to assess for appropriateness of therapy when necessary (See the Antimicrobial Stewardship SBARs for full details). Pharmacy continues previous efforts, including discontinued antibiotic order renewal reminders, renal dose adjustment monitor, IV to PO conversion, culture and sensitivity reporting, assessing completed antibiotics, and aminoglycoside monitoring. In 2019, a gap analysis was conducted using the CDC's Core Elements of Hospital Antimicrobial Stewardship Programs and CCRMC was found to be compliant with all elements. In 2020, the committee was granted approval to create an antibiotic order set to promote the appropriate and safe use of antibiotic therapy. Pharmacy worked with the ID physician to draft the order set in 2020. The order set was implemented in ccLink in January 2022 for provider use; pharmacy will continue to update the order set as needed per IDSA guidelines and based on antibiogram data. Pharmacy will also continue to trend and monitor for appropriate use of antimicrobials through quarterly data analyses and ASP meetings.

MEDICATION ERRORS BY SEVERITY LEVEL:

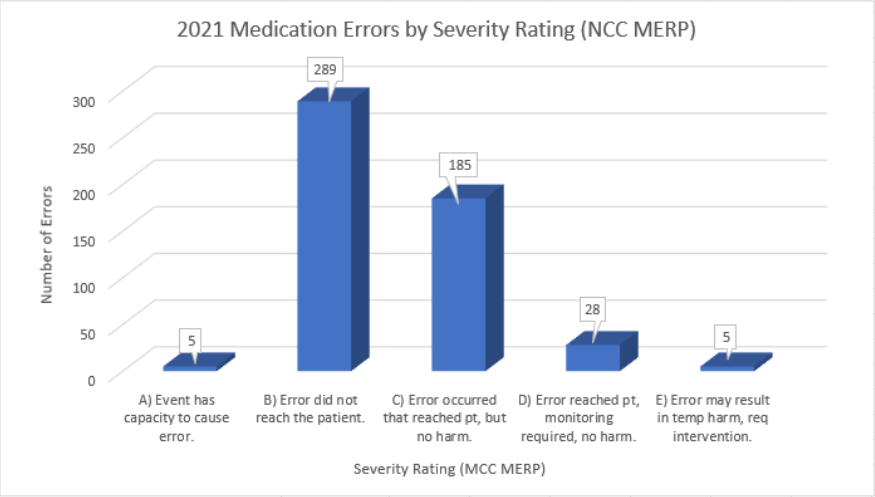
- The majority of errors reported did not result in patient harm (Level A-D). The harm index median has been consistently low over the years and has been marginally above 0 (0.0009%) since January 2019 (See Appendix B for graph).
    - Percentage of medication errors that did not result in any patient harm by year:
        - 2011= 97.8% (Level A-D (no harm)) = 547/ 559 SERS; Level E= 12)
        - 2012= 99.4% (Level A-D (no harm)) = 537/ 540 SERS; Level E= 3)
        - 2013= 99.1% (Level A-D (no harm)) = 846/ 853; Level E =7)
        - 2014= 98.5% (Level A-D (no harm)) = 977/ 992; Level E= 14; Level F= 1)
        - 2015=98% (Level A-D (no harm)) = 798/814; Level E= 15; Level F = 1)
        - 2016=99% (Level A-D (no harm)) = 769/780; Level E= 8; Level F = 3)
        - 2017=99.1% (Level A-D (no harm)) = 970/979; Level E= 8; Level F = 1)
        - 2018=98% (Level A-D (no harm)) = 1098/1,115; Level E= 17)
        - 2019=99% (Level A-D (no harm)) = 86/878; Level E= 9)

➢2020=99.4% (Level A-D (no harm)) = 505/508; Level E= 3)
➢2021=99.2% (Level A-D (no harm)) = 493/498; Level E= 5)

- In 2021, Level A-D, which did not cause any harm accounted for most of the errors. There were 5 level E events (1%), meaning that intervention was required or there was temporary harm. There were 0 errors that were level F-I in 2018-2021.



➢The near miss errors reported (Level A, Level B), continue to account for the majority of errors reported with 297/498 (60% of errors reported), vs. 259/508 (51%) in 2020, 530/878 (60%) in 2019 and 670/1,115 (60%) in 2018.
➢Level E errors (5 errors total):
  - There were 5 level E errors in 2021, vs. 3 level E errors in 2020, and 9 level E errors in 2019 and 17 errors in 2018 (a 71% reduction).
  - TREND: 4 of the 5 errors were prescribing errors.
    - TREND: 3 of the 4 prescribing errors involved inappropriate insulin management (2 cases of insulin not being reduced appropriately from home, 1 case involving NPO patient not receiving dextrose fluids). See the High Alert- Insulin section for further details.
  - Overall, the number of Level E errors involving insulin decreased from 9 errors in 2018 to 3 errors in 2021 (a 67% reduction). A multidisciplinary task force was formed to address the issues surrounding SubQ insulin management in 2018. See "High-Alert medication errors," section for specific actions involving insulin.
  - Education was provided to staff in all the events and process changes were implemented as necessary.
  - Pharmacy worked with the providers and ccLink IT to implement technological enhancements to prevent this from happening in the future (adding POCT BG checks and dextrose fluid to pre-op C section order set in addition to other pre-op order sets). The standalone regular IV insulin order was also removed from orderable so that it is only available in the order panels/order sets with the necessary safeguards and instructions.



HIGH-ALERT MEDICATION ERRORS (44 ERRORS REPORTED IN 2021):

High-Alert medications have an increased risk of causing significant harm to a patient when used in error. High-Alert medication errors are trended and analyzed by the pharmacy department in an effort to enhance or implement specific safeguards to reduce errors and reduce the risk of harm. This analysis is also conducted to ensure that pharmacy is compliant and proactive in regard to CCRMC's policy #3701 "High Risk/High Alert Medication Management." High alert medications included in this policy are anticoagulants, insulin, chemotherapy, PCA medications and fentanyl patch.

The number of high-alert medication errors decreased by 54% from 95 errors in 2018 → 74 errors in 2019→ 56 errors in 2020→ 44 errors in 2021. The median harm index (Level E and higher events) for 4 of the 5 high alert categories has been 0 since Q1 2015, meaning that none of the errors contributed to patient harm (anticoagulants, chemotherapeutics, fentanyl patch and PCAs). While insulin's median harm index has been at 2 errors per month since Q1 2018 (due to increased **vigilance and reporting by pharmacy), the percent rate of severe hypoglycemia (BG ≤ 50 mg/dl) has** declined from 3.5% in 2017 to 2.2% in 2018 and further down to 1.2% since February 2019. See the Insulin SBAR for full details. Below are actions taken in 2019 and plans for 2020 (See Appendix B for graphs).

Anticoagulants:

15 (0.04% of all anticoagulant orders) errors involved anticoagulants in 2021, vs. 18 (0.06% of all anticoagulant orders) in 2020, 24 (0.07% of all anticoagulant orders) in 2019 and 32 (0.09% of all anticoagulant orders) in 2018.

12 out of 15 (80%) involved heparin drip errors. 5 of the 12 heparin drip errors (41%) involved a new type of error not identified in previous years (missed STAT repeat aPTT order by nursing for aPTT > 120 seconds). 4 of the 5 errors occurred on the same unit so this information was shared with the nurse program manager to educate staff. There was a 17% reduction in errors from 2020 to 2021, a 38% reduction in errors from 2019 to 2021 and a 53% reduction from 2018 to 2021. The majority of errors since 2017 have involved heparin infusion errors (ex: missed or delayed aPTT result, rate not adjusted in a timely manner, wrong rate, etc.). In 2017, a multi-disciplinary task force was initiated to address the issues surrounding heparin infusion. In 2018, several improvement actions took place. In July 2019, a heparin calculator went live in ccLink. While errors from 2017 and 2018 decreased (heparin rate not being adjusted in a timely manner, lab timing errors by lab and nursing), the heparin calculator introduced a new set of errors involving the misuse and inconsistent use of the heparin calculator by nursing staff. The heparin calculator works well when used correctly. However, due to technological limitations, use of the heparin calculator is not mandatory in ccLink which has led to inconsistent and incorrect use of the calculator. Currently the heparin calculator is "required" for the initial administration but not for subsequent titrations

due to limitations of ccLink. Additionally, in 2021 a new error peaked which involved repeat STAT aPTT not being ordered per protocol by nursing for a supratherapeutic aPTT > 120 seconds. This redundant STAT aPTT is used as a preventative measure to rule out any errors of sampling from the line running heparin as an essential safety measure from the medication safety perspective. Education was provided in all cases. Additionally, the heparin task force began meeting again towards the end of 2020 to update the heparin calculator tip sheet and to reinforce education for nursing staff. In January 2021, dual sign off was added to all heparin administrations, previously was only available for 'Initial Infusion'. In April 2021, the heparin calculator text was updated to make each section "initial dose" and "subsequent titrations" stand out more. In order to prevent errors of calculator misuse/unuse, the nursing staff in 3D/3E (where the majority of errors occurred) began using a bedside heparin infusion worksheet to assist with titrations and began huddling during the shift when patients are actively on heparin to remind nurses to use the heparin calculator for all heparin titrations. The heparin task force will continue to work to minimize heparin infusion errors via education of staff and process changes when appropriate. Additionally in October 2021, the ambulatory anticoagulation clinic was taken over by pharmacy (previously a nursing run clinic).

Insulin:

22 errors (0.8% of all insulin orders) involved insulin in 2021, vs. 20 (0.08% of all insulin orders) in 2020, 34 (0.14% of all insulin orders) in 2019, and 40 errors (0.15% of all insulin orders) in 2018.

Note: Excluding MDV labeling errors from the count, there were 15 insulin errors which count for 0.7% of all insulin orders.

Of the 22 errors, 3 involved inappropriate management of patients on SubQ insulin (down from 5 errors in 2020 and 12 errors in 2019). There were 7 errors involving insulin drips, which is an increase from 4 in the previous year (TREND: 3 of the errors were delays in initiating the insulin drip in the ED prior to transfer to the inpatient unit. None of the delays resulted in patient harm). These findings were shared with the Nurse Program Manager of the ED to educate staff on prompt initiation of insulin drips when ordered. Out of the 22 errors, only 1 error resulted in a hypoglycemic event which was managed appropriately. Since 2018, there was an increased vigilance surrounding hypoglycemic events. A multidisciplinary task force was formed in 2018. Through this committee, several actions have taken place including 1) Changes in ccLink (optimization of order sets and panels, creation of best practice alerts, etc.) 2) Optimization of pharmacy monitoring process to ensure uniform review of patients (See Appendix D for full list of actions taken) and identification of high-risk patients (ex: patients with worsening renal function). 3) A quality assurance physician oversight process was created in 2019 which involves a medical staff physician reviewing the cases of severe hypoglycemia (BG ≤ 50 mg/dl), providing feedback to the primary team, and documenting interventions via a "Hypoglycemia prevention," progress note in the patient's chart. See appendix F for a full list of all actions taken. 7 of the errors involved inappropriate expiration date labeling of insulin multidose vials by nursing (no expiration label after opening, wrong expiration date written, etc.). This is down from 8 errors in 2020, and 13 errors in 2019. The multi-dose vial labeling issue has been brought up at the organization's safety huddle and several actions were taken to resolve the issue, including the purchase of new expiration labels, adoption of a calendar tool to help with a calculation of 28 days out, and education of nursing staff. In 2018, a cycle count was implemented for charge nurses to conduct, and this was reinforced in 2019 in 2020. Data will continue to be trended and reported in 2022.

Chemotherapeutics:

4 errors (0.16% of all chemotherapy orders) involved chemotherapeutic agents in 2021, vs. 14 errors (0.8% of all chemotherapy orders) in 2020, 8 errors (0.29% of all chemotherapy orders) in 2019, and 13 errors (0.47% of all chemotherapy orders) in 2018.

In 2021, 50% (2 out of 4 errors) involved errors with the CADD pump (1 error due to battery depletion and 1 error due to the bag leaking). This is a reduction from 6 errors involving CADD pumps in 2020 (67% reduction). The infusion clinic nurses send extra batteries home with the patients. An instruction sheet was created and provided to the patients on how to switch out the batteries of the new CADD pumps. Pharmacy will continue to monitor for CADD pump errors and review CADD pump data on a regular basis.

Fentanyl Patch:

There were 0 errors involving fentanyl patch in 2021 (0% of all fentanyl patch orders), vs. 1 error in 2020 (2.2% of all fentanyl patch orders), 0 errors in 2019 (0% of all fentanyl patch orders), and 3 errors in 2018 (1.2% of all fentanyl patch orders).

Several efforts are in place to ensure safe use of fentanyl patch at CCRMC, including a thorough initial screening for appropriateness by the clinical pharmacy department along with a daily clinical monitor and patient education. Additionally, in 2020 pharmacy made the fentanyl patch require dual pharmacist independent verification as an extra step to ensure safe use of fentanyl patch. Going forward in 2021, staff will continue to be vigilant to ensure safe and appropriate use of fentanyl patch at CCRMC.

PCA:

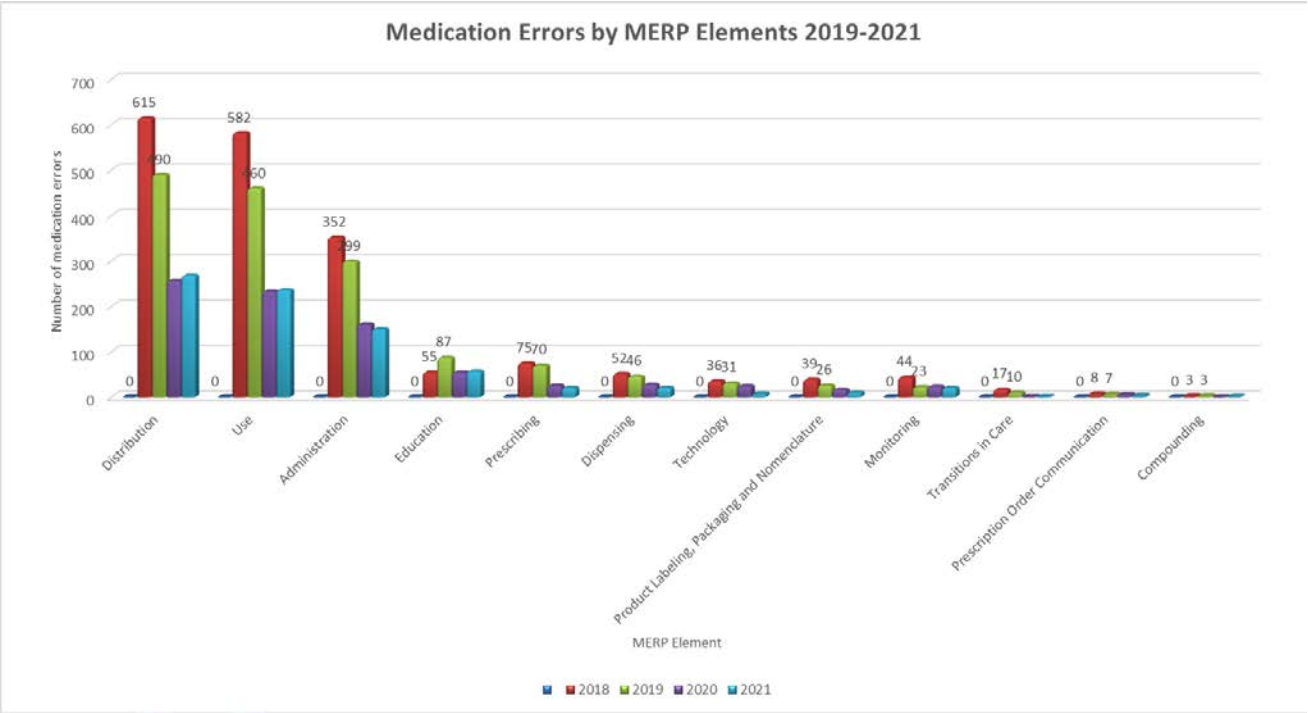
3 errors involved a PCA in 2021 (0.77% of all PCA orders), vs. 3 errors in 2020 (0.86% of all PCA orders), 6 errors in 2019 (1.6% of all PCA orders), and 7 errors in 2018 (1.2% of all PCA orders).

There was no trend among the 3 errors. 1 was a delay in starting the PCA, 1 was inaccurate documentation of PCA delivery in the documentation flowsheet and 1 was due to the PCA being continued after the order was discontinued. None of the errors resulted in patient harm. In 2020, pharmacy, nursing and ccLink IT worked together, meeting regularly to update the PCA and documentation tools to ensure that PCAs are easier to order, verify and administer. Prior to that in 2019, the PCA documentation for nurses was optimized via flowsheet enhancements. Going forward in 2022, PCA errors will continue to be monitored and any trends will be reported. The pharmacy will continue to review patients on PCAs daily.

ERRORS BY MERP ELEMENTS IN 2021:

The breakdown of these 498 medication errors into MERP elements, in order of most errors reported can be seen below. The error rate is a calculation of the # of errors/ # of doses dispensed (1,105,468):

- Distribution: 268= 0.024% error rate vs. 0.026% in 2020, 0.039% in 2019 and 0.056% in 2018
- Use: 236= 0.021% error rate vs. 0.023% in 2020, 0.036% in 2019 and 0.053% in 2018
- Administration: 150 = 0.014% error rate vs. 0.0165% in 2020, 0.023% in 2019 and 0.032% in 2018
- Education: 57 = 0.005% error rate vs.0.006% in 2020, 0.007% in 2019 and 0.005 in 2018
- Prescribing: 21= 0.002% error rate vs 0.003% in 2020, 0.006% in 2019 and 0.007% in 2018
- Dispensing: 21 = 0.002% error rate vs. 0.003% in 2020, 0.004% in 2019 and 0.005% in 2018
- Technology: 8= 0.001% error rate vs. 0.003% in 2020, 0.002% in 2019 and 0.003% in 2018
- Product Labeling, Packaging and Nomenclature: 11 = 0.001% error rate vs. 0.002% in 2020, 0.002% in 2019 and 0.004% in 2018.
- Monitoring: 21= 0.002% error rate vs. 0.003% in 2020, 0.001% in 2019 and 0.004% in 2018.
- Transitions in Care: 1= 0.0001% error rate vs. 0.0001% in 2020, 0.0008% in 2019 and 0.002% in 2018
- Prescription Order Communication: 4= 0.0004% error rate vs. 0.0006% in 2020, 0.0006% in 2019 and 0.0007% in 2018
- Compounding: 2= 0.0002% error rate vs. 0% in 2020, 0.0002% in 2019 and 0.0003% in 2018



Element #1. PRESCRIBING

TRENDS NOTED:

- "Prescribing" accounts for 21 medication errors in 2021. This calculates to a 0.002% (# of errors/# of doses dispensed) error rate vs 0.003% in 2020, 0.006% in 2019 and 0.007% in 2018.
- Breaking down the events by Specific Event Type, the top 3 event types were as follows:
  - 5 errors involved management of diabetic patients on insulin, which is an increase from 2 errors in 2020, but the same as 5 errors in 2019 and a decrease from 6 errors in 2018. The decrease seen in 2020 may have been due to the COVID-19 pandemic and low hospital census compared to 2019 and 2021.
    - TREND: 2 errors involved continuation of home insulin doses without lowering the dose while hospitalized. One case resulted in hypoglycemia which was treated appropriately, and one case was a near miss that did not reach the patient.
    - TREND: 2 errors involved IV to SubQ conversion. One case involved patient having both IV and SubQ insulin active orders (no hypoglycemia and the SubQ insulin was discontinued per recommendation of pharmacist), and one case involved inappropriate IV to SubQ conversion resulting in hypoglycemia which was treated appropriately.
    - One error involved the failure to order a dextrose containing fluid for an NPO patient undergoing a C-section. The C-section order set was optimized to include a pre-checked dextrose fluid for diabetic patients.
  - Medication prescribed and given too soon after a dose had already been given accounted for 5 errors in 2021 vs. 4 errors in 2020, 1 error in 2019, and 5 errors in 2018
    - TREND: 2 of the 5 errors involved patients receiving a x1 order of acetaminophen being administered in the OR or PACU and then a scheduled order being released once patient is transferred to the unit and being administered too soon (within 3 hours of previous dose).
  - Duplications in therapy accounted for 3 errors in 2021 vs. 4 errors in 2020, 4 errors 13 errors in 2019 and 3 errors in 2018

- TREND: 2 of the duplications in therapy involved analgesic medications.
- TREND: The decrease in duplications in therapy is as a result of the multidisciplinary efforts to reduce duplications of PRN medications with the same indications. Several actions were taken towards the end of 2019 including order set changes, education to medical staff, pharmacy and nursing staff, and oversight by the pharmacy department via a clinical monitor.

- Contraindicated medication prescribed accounted for 2 errors in 2021, consistent with 2 errors in 2020, 2 errors in 2019 and 3 in 2018. There was no trend in these errors and education was provided to the providers in both cases.

- There were no major trends by drug class with the "Prescribing," errors.
- Breaking down "Prescribing" errors by MERP severity rating, we see that there were:
  - 9 level C errors
  - 5 level B errors
  - 4 Level E errors
  - 3 level D errors (see "Medication Errors by Severity Level," section for more detail)
  - See "Percent Medication Error Rate" graph with harm index (Appendix B)

MAIN ACTIONS TAKEN:

- In regard to the errors involving inappropriate insulin management, see the "high alert medication errors" section for actions taken.
- In regard to medication being ordered and administered too soon after a dose has already been given, it was found that the majority of these types of errors occur upon transition of patients from the OR to PACU/ PACU to other units or when prescribing a scheduled medications after a one-time order was placed and administered. The pharmacy department worked with ccLink to create a BPA alert to flag the nurse whenever acetaminophen is being administered less than 3 hours after the previous dose.
- In an effort to minimize therapeutic duplication of PRN medication orders at CCRMC, several order sets have been optimized and order panels have been created with clear instructions for nurses to make selections between drugs prescribed for the same indication (See Appendix H). Additionally, the pharmacy department monitors for therapeutic duplication 1) upon verification of orders and 2) via a retrospective review of the dashboard report "Rx Multiple Order with same PRN Reason." Any interventions made by pharmacy are documented via "I-vents" under the category "duplicate therapy."

ANALYSIS: In 2021, the top error types were inappropriate management of patients on insulin and medication ordered and administered too soon after a previous dose had been given. See the "High Alert-Insulin," section for details on errors identified and actions taken. In order to prevent future errors involving acetaminophen being ordered and administered too soon after a previous dose, a BPA was created per pharmacy's request to alert nursing of a previous dose being administered within the last 3 hours. Pharmacy will continue to monitor for these error types. It is also important to note that in regards to duplication therapy of PRN medications, several actions were taken in 2019 including enhanced monitoring and reporting by the pharmacy department and the optimization of several order sets/creation of new order panels. These efforts resulted in a 25% decrease in this type of error from 2020 to 2021. Going forward in 2022, the pharmacy department will continue to monitor and trend duplications in PRN therapy errors.

Element #2. PRESCRIPTION ORDER COMMUNICATION

TRENDS NOTED:

- "Prescription Order Communication" accounts for 4 total medication errors in 2021. This calculates to a 0.0004% error rate (4 of errors/1,105,468 of doses dispensed) vs. 0.0006% in 2020, 0.0006 in 2019 and 0.0007% in 2018.
- Breaking down the events by Specific Event Type:

- TREND: There were two errors involving continuous drips where the provider communicated to stop the drips but did not communicate if/when the drips should be restarted. Additionally in one case, the communication to stop the drip was via a ccLink chat message rather than an actual order in the chart.
- TREND: 2 errors involved atropine to be placed at bedside but the nurse mistakenly administering it because it showed up on the MAR as a "scheduled order."

- When reviewing the errors by drug class, there was a trend seen by drug class (2 errors involved atropine at bedside order as noted above).
- Breaking down "Prescription Order Communication," errors by MERP severity rating, there were:
  - 4 level C errors
  - Therefore, none of the errors resulted in harm. See "Percent Medication Error Rate" graph with harm index (Appendix B)

MAIN ACTIONS TAKEN:

Education was provided to staff involved in all cases. The default frequency for atropine is x ONCE. Pharmacy is updating the order to default to "once as needed" with the PRN reason "as needed for HR of 30 bpm. Contact MD after atropine is administered."

ANALYSIS: Going forward in 2022, pharmacy will continue to monitor prescription order communication errors for any trends and act accordingly.

Element #3. PRODUCT LABELING, PACKAGING & NOMENCLATURE

TRENDS NOTED:

- "Product Labeling, Packaging, and Nomenclature" accounts for 10 medication errors in 2021. This calculates to a 0.001% error rate (# of errors/# of doses dispensed), vs. 0.002% in 2020, 0.002% in 2019 and 0.004% in 2018.
- Breaking down "Product Labeling, Packaging, and Nomenclature" by specific event type, the top event types were as follows:
  - TREND: 8/10 (80%) involved multi-dose vial expiration labeling issues by nursing (28-day expiration date missing, wrong, etc.), a reduction from 11 errors in 2020, 17 errors in 2019 and 19 errors in 2018. These were all "near miss" medication errors that did not reach any patients.
  - There were no other trends noted among the remaining errors.
- Breaking down "Product Labeling, Packaging and Nomenclature," by drug class, in 2021, the top drug class was insulin, which accounted for 7 of the 8 MDV labelling errors (88%). The insulin MDVs were either incorrectly labeled or not labeled with beyond use dates after being opened.
- Breaking down "Product Labeling, Packaging, and Nomenclature" errors by MERP severity rating, there were:
  - 10 level B events
  - 1 level C event

  - Therefore, none of the events resulted in harm. See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN:

The multi-dose vial (MDV) expiration labeling errors issue was brought up by pharmacy at the organizational safety huddles. Additionally, in 2018, charge nurses began to receive a list of Omnicell MDVs at their units and then cycle count the MDVs every shift to monitor compliance with MDVs operation. A 28-day calendar tool was also provided by pharmacy to nursing to assist nurses in determining the expiration date. In 2019, it was found that the charge nurses

were not doing the cycle counts as intended. Pharmacy continues to reinforce cycle counts of the MDVs by nursing and continues to monitor for these errors and report findings to the Medication Safety Committee.

ANALYSIS: Looking back in 2021, 80% of the "Product Labeling, Packaging and Nomenclature," errors were due to multi-dose vial expiration date labeling by nurses. In 2020 the errors were addressed as specified above at an institutional level with pharmacy working closely with nursing leadership to resolve the issue. Education was provided in all cases. Going forward, medication errors will continue to be evaluated and trended in 2022.

Element #4. COMPOUNDING

TRENDS NOTED:

- "Compounding" accounts for 2 errors in 2021. This calculates to a 0.0002% error rate (# of errors/# of doses dispensed) vs. 0 errors in 2020, 0.0002% in 2019 and 0.0003% in 2018.
  - ➢ TREND: both compounding errors were due to nursing pulling the wrong IV fluid to compound a medication after pharmacy hours. In both cases, the IV solution used was compatible with the medication.
- Breaking down "Compounding" errors by MERP severity rating, there were:
  - ➢ 2 level C events
  - ➢ Therefore, none of the events resulted in harm. See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN:

CCRMC continues to be compliant with USP 797 and USP 800 standards. Additionally the pharmacy provides IV admixture training for nursing on a yearly basis. Starting in November 2020, construction was started to change the inpatient pharmacy compounding area from a segregated compounding area to an ante/buffer clean room and was continued through 2021. The construction is planned to be completed in 2022.

ANALYSIS: Going forward in 2022, pharmacy will continue to monitor for compliance with the USP 797 and 800 standards via pharmacy audits.

Element #5. DISPENSING

TRENDS NOTED:

- "Dispensing" accounts for 21 total medication errors in 2021. This calculates to a 0.002% error rate (# of errors/# of doses dispensed), 0.002% in 2020, 0.004% in 2019 and 0.005% in 2018.
- Breaking down the Dispensing errors by Specific Event Type, the top event types were as follows:
  - ➢ TREND: 6 errors involved wrong dose, strength, formulation, or medication being dispensed, an increase from 3 errors in 2020, but a decrease from 13 errors in 2019 and 11 errors in 2018 (45% improvement since 2018). 4 of the 6 errors were near misses that did not reach the patients and 2 reached the patients but there was no harm.
    - ➢ TREND: 2 of the 6 errors could have been prevented if the barcode scanning was used as it should have been.
    - ➢ TREND: 2 of the 6 errors involved pharmacist dosing vancomycin at the wrong dose
  - ➢ TREND: 3 errors involved dispensing delay, resulting in delay in therapy (1 error was due to the antibiotic being sent to wrong unit, 1 due to delay in compounding and delivering insulin drip, and 1 due to medication being dispensed from Omnicell instead of MIP).

- There was no trend in the remaining errors.

- Breaking down the dispensing errors by drug class, the following was noted:
  - 7 errors involved antibiotic agents
    - TREND: 2 errors involved delays in therapy
    - TREND: 2 errors involved vancomycin trough errors (1 not ordered, and one MAR note with wrong time)
    - TREND: 2 errors involved wrong dose of vancomycin ordered
  - No other trend in drug class was observed
- Breaking down "Dispensing" errors by MERP severity rating, there were:
  - 10 level B events
  - 10 level C events
  - 1 level E event

  - Therefore, 1 of the events resulted in harm. See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN:

- In January 2018, pharmacy began utilizing medication barcode scanning when filling cart-fill and first dose PO medications (Note: IV medications have been barcode scanned since the inception of EPIC at CCRMC). This resulted in a reduction in errors involving wrong dose/strength/formulation being dispensed. In 2021, there were 6 wrong dose, strength, formulation, or medication being dispensed. Two of the cases could have been prevented if the barcode scanning technology was utilized as is standard procedure. Staff was educated. The pharmacy department has been working with ccLink IT to further expand barcode scanning into the willow ambulatory environment of the pharmacy.
- For medications that involved dispensing delays, all pharmacists and pharmacy staff were educated.
- Pharmacy staff was educated in all cases.

ANALYSIS:

Looking back in 2021, the majority of dispensing errors were due to wrong dose, strength, formulation or medication being dispensed. Since 2018, the pharmacy department has optimized barcode scanning. Going forward, barcode scanning will also be implemented in the willow ambulatory environment. In regards to medications being prescribed too soon after a previous dose, the pharmacy department will work with ccLink IT in 2021 to implement technological fixes to prevent these types of errors.

Element #6. DISTRIBUTION

TRENDS NOTED:

- "Distribution" accounts for 268 total medication errors in 2021. This calculates to a 0.024% error rate (# of errors/# of doses dispensed), vs. 0.026% in 2020, 0.039% in 2019 and 0.056% in 2018. In 2021, 77% of the distribution errors were categorized as level A or B events, that did not reach any patient.
- Breaking down "Distribution" errors by Specific Event Type, the top event types were as follows:
  - 218 (82%) distribution errors were due to controlled substance discrepancy errors that were entered by pharmacy department as part of the controlled substance surveillance program at CCRMC. See "Medication Errors by Drug Class- Controlled Substance," section for more information.
  - 18 errors were due to issues surrounding Omnicell. TREND: Specifically, 9 errors included wrong medication found in Omnicell bin. This is a 44% decrease since 2018 (16 errors in 2020, 16 errors in 2019 and 25 errors in 2018).

- 8 errors involved multidose vials expiration labeling by nursing of certain medications in Omnicell (TREND). See "See "Product labeling, packaging and nomenclature" section for more details." This is an improvement from 11 errors in 2020.
- Other errors were due to miscellaneous causes in which no trend could be noted.

- Breaking down "Distribution" errors by drug class, the following was noted:
  - 250 errors were due to controlled substances (218 were controlled substance discrepancies)
- Breaking down "Distribution" errors by severity rating, there were:
  - 219 level B errors
  - 45 level C errors
  - 2 level A errors
  - 2 level D errors

  - Therefore, none of the events resulted in harm. See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN:

- See "Medication Errors by Drug Class- Controlled Substance," section for in-depth review of controlled substance monitoring and corrective actions.

- Pharmacy staff was educated to ensure accurate filling of Omnicell medications. There is barcode scanning that is utilized in Omnicell, but due to technological limitations, only one tablet of each medication fill is required to be scanned, instead of all of them. CCRMC pharmacy leadership has repeatedly reported this to Omnicell as an issue that needs addressing.

- In regards to the errors involving multidose vial expiration labeling by nursing, see "Product labeling, packaging and nomenclature" section for more details.

ANALYSIS: Looking back in 2021, the majority of distribution errors surrounded controlled substance monitoring. The total number of controlled substance discrepancies decreased from 486 errors in 2018 to 386 errors in 2019, 193 in 2020 and 218 in 2021 (an overall 55% decrease from 2018 to 2021). Pharmacy will continue to monitor for controlled substance discrepancies going forward in 2022.

Element #7. ADMINISTRATION OF MEDICATION

TRENDS NOTED:

- "Administration" accounts for 150 medication errors in 2021. This calculates to a 0.014% error rate (# of errors/# of doses dispensed), which is decreased from 0.017% in 2020, 0.023% in 2019 and 0.32% in 2018.
- Breaking down "Administration," errors by Specific Event Type, the top event types were as follows:

  - 36 errors involved "missed doses." When looking at the number of missed doses over the total doses dispensed, this calculates to a 0.003% in 2021 vs. 25 errors in 2020 (0.003%), 51 errors in 2019 (0.004%) and 47 errors in 2018 (0.004%).

    - Of the 36 missed doses, the top error trends were as follows:
      - Incorrect tubing connections/ line clamped: 8 errors (TREND: 7 of 8 cases involved antimicrobials [88%]). 3 errors occurred during PM shift, 2 during day shift and 2 during NOC shift. 1 error occurred during the lunch hour, 2 errors occurred around times of shift

change from NOC to day shift. The total errors due to incorrect tubing connections/line clamped decreased to 8 errors in 2021 vs. 9 errors in 2020,14 errors in 2019 and 14 errors in 2018.

- Nurse forgot/distracted/busy: 14 errors (no trend was noted among the 14 errors).

➢ Breaking down the "missed dose," errors by location: 3E IMCU (6 errors), 4B Med Surg (6 errors), 5D Med Surg (5 errors), 3B ED (4 errors), 5A L&D (4 errors), 3D ICU (3 errors), 2C PACU (2 errors), 5C Post-partum (2 errors), 2B OR (1 error), 3A RAD (1 error), 4C Psych (1 error) and 4A Med Surg (1 error)

➢ 24 errors were due to overrides (See Appendix C for graphs). When looking at the overrides over the total number of doses dispensed from Omnicell in the year, this calculates to a 0.002% override rate in 2021, a reduction from 0.003 in 2020, 0.006% in 2019 and 0.009% in 2018.

➢ Looking at override errors by unit, the following 4 units had the most overrides.

- 3D (ICU)- 5 overrides (vs. 3 in 2020, 6 in 2019 and 12 in 2018)
- 3E (IMCU)- 3 overrides (vs. 1 in 2020, 3 in 2019 and 1 in 2018). Note that IMCU does not normally peak as one of the top units, however in 2021, there were times during the COVID-19 pandemic surges where the IMCU was converted to an ICU unit which may have contributed to the increase in overrides being more consistent with ICU override frequency.
- 3B (ED)- 3 in 2021 (vs. 8 in 2020, 19 in 2019, and 27 in 2018)
- 5A (L&D)- 2 overrides (vs. 8 in 2020, 7 in 2019 and 7 in 2018)

➢ There was no trend in drug class among the overrides.

- Breaking down administration errors by drug class, the following was noted:

➢ 25 anti-infectives (vs. 34 in 2020, 52 in 2019 and 56 in 2018). (TREND: the top error type for anti-infectives was missed dose (9 errors), followed by delay (6 errors). See "antimicrobials," section above for more details.

➢ 19 controlled substances (vs.19 in 2020, 61 in 2019 and 80 in 2018). See "controlled substances," section above for more details.

➢ 16 non-narcotic analgesic errors (vs. 6 in 2020, 19 in 2019 and 15 in 2018)

➢ TREND: 13 errors involved acetaminophen (8 involved dose given too soon [< 3 hours after previous dose due to a x1 order followed by a scheduled order])

➢ TREND: 3 errors involved NSAIDS (no trend)

➢ TREND: Of the 16 non-narcotic analgesic errors, 9 involved dose given too soon [< 3 hours after previous dose due to a x1 order followed by a scheduled order]).

- Breaking down administration errors by severity level:

➢ 18 were level B

➢ 107 were level C

➢ 21 were level D

➢ 1 level E

<u>MAIN ACTIONS TAKEN:</u>

- All administration override issues: NPMs investigated 100% of SERS for overrides, and all were appropriate per NPM, and were either resolved, or orders were back charted. Data from the Annual Override Report is shared with Nursing Leadership.

- For the errors involving non-narcotic analgesic being administered too soon after a x1 order, a BPA was created to notify nurses if a dose was previously administered within the last 3 hours. Additionally, a logic was created in the post-op order set so that if a x1 dose of acetaminophen or ketorolac was administered in the OR, then the timing of the post-op order would be offset so that a dose would not be given too soon.

- In regards to the nurses forgetting to unclamp the secondary line, see above "Antimicrobials," section for more details on actions taken.

- In regards to the controlled substance errors, see above "controlled substances," section for more details.

ANALYSIS:

Looking back in 2021, the top errors that peaked were missed dose errors followed by override errors which is consistent with the previous year. In regards to missed doses due to the medication line being clamped, there are several processes in place from previous years that have contributed to the downtrend of clamp errors and maintaining a low number of errors ((i.e., audits by pharmacy and nursing, education by the professional development department). In 2019, the pharmacy department's Performance Improvement Project focused on minimizing missed doses due to medication transfer non-compliance from 3B ED to subsequent units. Several actions were taken including nursing education, warnings in ccLink to remind nurses to retrieve the patient's medications upon transfer and pharmacy technicians double checking that the patient is still in the ED when delivering medications. Going forward in 2022, pharmacy is working with ccLink IT to enable tracking of medication location to help locate missing medications. Pharmacy will continue to be vigilant in monitoring for controlled substance discrepancies (specific actions taken and to be continued are specified in the "Medication Errors by Drug Class- Controlled Substance," section). Pharmacy will also continue to monitor the trend of non-narcotic analgesics being administered too soon. Refer to the overrides SBAR for trends and actions taken.

Element #8. MONITORING

TRENDS NOTED:

- Monitoring accounts for 21 total medication errors in 2021. This calculates to a 0.002% error rate (# of errors/# of doses dispensed) vs. 0.002% in 2020, 0.001% in 2019 and 0.004% in 2018.
- Breaking down "monitoring," errors by Specific Event Type, the most common event types were as follows:
  - ➢11 errors involved heparin infusion vs 5 errors in 2020, 10 errors in 2019 and 13 errors in 2018.
  - ➢6 errors involved vancomycin trough monitoring errors vs. 9 in 2020, 9 in 2019 and 15 in 2018 (see the "Antimicrobial," section for more details).
  - ➢1 error involved insulin infusion vs. 1 in 2020, 1 in 2019 and 3 in 2018.
- Breaking down monitoring errors by class, the following was noted:
  - ➢11 due to anticoagulants (TREND: 11 of 11 cases (100%) involved heparin infusion- see above)
  - ➢6 due to anti-infectives (TREND: 6 out of 6 cases (92%) involved vancomycin trough monitoring- see above)
- Breaking down Monitoring errors by harm level, there were:
  - ➢17 level C
  - ➢ 3 level D
  - ➢ 1 level B

  - ➢See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN:

- For heparin infusion errors, see the "High Alert Medication Errors," section for actions taken. Additionally, pharmacy reviews all heparin infusions on a daily basis and communicates with the nurse involved when an action is needed.
- For vancomycin trough errors, see the "Antimicrobials," section for details of actions taken.

ANALYSIS: In 2021, the majority of monitoring errors were due to issues surrounding heparin drip and vancomycin trough monitoring. See the "high alert section," for more details about the heparin drip issues and actions taken. See the "antimicrobial," section for vancomycin trough errors and actions taken.

Element #9. Education

TRENDS NOTED:

- "Education accounts for 57 errors in 2021. This calculates to a 0.005% error rate (# of errors/# of doses dispensed), vs. a 0.006% in 2020, 0.007% in 2019 and 0.005% in 2018.
- The top error types that peaked were:
  - 7 errors involved delays (TREND: 2 involved delays in Kcentra administration (both level D events not contributing to harm)
  - 4 errors involved monitoring (TREND: 3 heparin drip errors- see "High Alert," section for more details).
  - 3 errors involved wrong medication/fluid errors (no trend identified).
- The top drug classes that peaked were:
  - 7 antidiabetic agents (TREND: 6 involved insulin and 2 of those errors resulted in hypoglycemia)- see "high alert" section for further details)
  - 6 narcotics (there was no trend among these errors)
  - 6 anti-infectives (There was no trend among these errors)
- Education was provided to involved staff in all cases.
- Breaking down Monitoring errors by harm level, there were:
  - 23 level B
  - 16 level C
  - 13 level D
  - 4 level E (see "Medication Errors by Severity Level," section for more detail)
  - 1 level A

  - See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN: Education was provided to involved staff or patient (when applicable) to ensure safe medication use. See the "Antimicrobials" section for specific actions taken in regards to the antimicrobial errors and the "controlled substance," section for narcotic errors. See the "High Alert Medication Errors" section for specific actions taken in regards to insulin. In regards to the errors involving Kcentra, pharmacy reached out to the professional development department to educate nurses on Kcentra administration.

ANALYSIS:

In 2021, there were trends noted in errors involving delays in therapy, heparin drip titration, and insulin management. See the "High Alert Medication Errors" section for more details on actions taken and plans going forward in 2022.

Element #10. USE

TRENDS NOTED:

- "Use" accounts for 236 total medication errors in 2021. This calculates to a 0.021% error rate (# of errors/# of doses dispensed), a decrease from 0.024% in 2020, 0.036% in 2019 and 0.053% in 2018. This is the #2 most common MERP element classification for errors in 2021, which is due mostly to controlled substance discrepancy monitoring by pharmacy department. See "Medication Errors by Drug Class- Controlled Substance," section for in-depth review of controlled substance monitoring and corrective actions taken/corrective actions.
- Breaking down the "Use," errors by Specific Event Type, the top errors were as follows:
  - 218 (92%) of errors were due to controlled substance discrepancy monitoring errors that were entered by pharmacy department as part of the controlled substance surveillance initiatives. This is an increase from 193 in 2020, but reduction from 386 errors reported in 2019 and 486 errors reported in 2018 (an overall 55% reduction). See "Medication Errors by Drug Class- Controlled Substance," section for in-depth review of controlled substance monitoring and corrective actions taken/corrective actions.
  - 8 errors involved labeling issues (TREND: all 8 errors involved multi-dose vial expiration labelling by nursing staff- see the "Product labeling, packaging and nomenclature," section for more detail.)
- Breaking down the "Use, errors by drug class, the following was noted:
  - 221 errors involved controlled substances (218 controlled substance discrepancies)
  - 8 errors involved anti-diabetic agents (TREND: 8 errors involved multi-dose vial expiration labelling by nursing staff)
  - 5 errors involved propofol (the propofol bottle not replaced after 12 hours)
- Breaking down "Use" errors by severity rating, there were:
  - 195 level B errors
  - 43 level C errors
  - Therefore, none of the events resulted in harm. See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN:

- See "Medication Errors by Drug Class," section for in-depth review and actions taken in regards to controlled substance discrepancy errors and for errors involving anti-infectives.
- See the "Product labeling, packaging and nomenclature," section for actions taken in regards multi-dose vial expiration labeling errors by nursing.

ANALYSIS: Looking back in 2021, the majority of "use" errors surrounded controlled substance monitoring, which are trended via unit specific controlled substance discrepancy reports. However, the number of discrepancies decreased by 60% from 2018 to 2021 as a result of the ongoing efforts to reduce discrepancies. Going forward in 2022, pharmacy will continue to be vigilant in monitoring for controlled substance discrepancies and continue to report all discrepancies in SERS.

Element #11. TECHNOLOGY

TRENDS NOTED:

- "Technology" accounts for 8 total medication errors in 2021. This calculates to a 0.001 % error rate (# of errors/# of doses dispensed) vs. 0.003 % in 2020, 0.002% in 2019 and 0.003% in 2018.

- Breaking down the "technology," errors by "Specific Event Type," the main error types were:
  - 4 errors involved issues with IV pumps, 2 errors with the Alaris pump and 2 errors with CADD pump in the infusion center. The number of errors related to CADD pump decreased from 7 in 2020 to 2 in 2021. (See the High Alert Section for more details).
  - 2 errors involved Omnicell (No TRENDs found)
- Breaking down "technology," errors by drug class, the following was noted:
  - 2 errors involved chemotherapy (TREND: 2 cases involved CADD pump malfunctions).
- Breaking down "Technology" errors by severity rating, there were:
  - 5 level B errors
  - 3 level C errors
  - Therefore, none of the events resulted in harm. See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN:

- In regards to the CADD pump issues, the pumps were replaced in 2020. See the "High Alert," section for more details.

ANALYSIS: Looking back in 2021, the most common error IV pump issues involved CADD pump (ex: battery depletion, pump malfunction/leaking, etc.) however the number of errors relating CADD pump decreased from 7 in 2020 to 2 in 2021. This is likely due to the CADD pumps were replaced in 2020 with new smart pumps with drug libraries and the capability to run reports for quality monitoring. Going forward in 2022, data will continue to be trended and processes will be optimized as needed.

Element #12. TRANSITIONS IN CARE

TRENDS NOTED:

- "Transitions in Care accounts" for 1 total medication error in 2021. This calculates to a 0.0001% error rate (# of errors/# of doses dispensed) which is the same as 0.0001% in 2020, 0.0008% in 2019 and 0.002% in 2018.
- 1 error involved missing medications that had already been dispensed by pharmacy due to medications not being transferred with the patient upon transfer from one unit to the next.
- Breaking down "Transitions in Care" errors by severity rating, there were:
  - 1 level B error
  - Therefore, none of the events resulted in harm. See "Percent Medication Error Rate" graph with harm index (Appendix B).

MAIN ACTIONS TAKEN:

- Staff was educated in the case listed above.

ANALYSIS: Looking back in 2021, the 1 error involved medications not being transported with the patient upon transfer from one unit to the next, however there was a 50% decrease in this error type from 2020 to 2021. The pharmacy department's performance improvement project was to deliver medications to patients in a timely manner and improve pharmacy operations by reducing unnecessary in-basket messages. Upon investigation, it was found that the top reason for in-basket messages was for missing doses. With further analysis, it was found that one of the top two contributing factors to missing doses was non-compliant medication transfer events (i.e., medications already dispensed from pharmacy not being transferred with patient from one unit to the next). In 2020, pharmacy and nursing focused on educating staff which contributed to the decline in errors reported. Simultaneously, in 2020, pharmacy explored utilizing a dispense tracking system to help with locating missing doses that have already been dispensed. In 2021,

the necessary equipment was purchased and going forward in 2022, the pharmacy department will plan to work with ccLink IT to pilot the dispense tracking system when it becomes fully functional.

Overall Summary:

- There was a 2% decline in SERS reported in 2021 vs. 2020, a 43% decline since 2019 and a 55% decline since 2018. The drop from 2018 and 2019 can be attributed to the reduction in controlled substance discrepancies in 2020 and 2021 vs. 2018 and 2019. This is as a result of the ongoing efforts by Pharmacy, Nursing and Anesthesiology to minimize controlled substance discrepancies (technological enhancements, education, etc.) along with oversight from the Opioid Stewardship Program Committee.
- There were 498 medication related SERS reported in 2021, compared to 508 in 2020, 879 in 2019 and 1,115 in 2018. When looking at the percent of errors reported (# of errors/ # of doses dispensed), there was a 0.05% error rate in 2021, vs. 0.05% in 2020, 0.07% in 2019 and 0.1% in 2018. The decrease in percent error rate can in large part be attributed to the reduction in controlled substance discrepancies since 2018 to 2020. The decrease is as a result of the ongoing efforts by Pharmacy, Nursing and Anesthesiology to minimize controlled substance discrepancies (technological enhancements, education, etc.) along with oversight from the Opioid Stewardship Program Committee. It is important to note that 100% of controlled substance discrepancies are investigated and resolved.
- In 2021, 99.2% of error did not contribute to any patient harm (Level E errors or higher).
- Controlled substances contributed to the highest number of errors. The top error type was controlled substance discrepancies. Following controlled substances were anti-infectives. The top error types were missed doses due to IV line remaining clamped and vancomycin trough monitoring errors.
- Pharmacy department promotes awareness and transparency in the organization and uses SERS as an approach to identify areas for improvement so that strategies could be implemented to correct these issues. Pharmacy department generates the most SERS of the organization in order to support this methodology for improvement.

Conclusion: The MERP program has been effective in detecting medication errors and in developing corrective actions taken for the past year. The annual SERS review was completed in February 2022.

CONTRA COSTA REGIONAL MEDICAL CENTER POLICY #: 5013
DEPARTMENT OF PHARMACY SERVICES

MEDICATION ERROR REDUCTION PLAN

I. PURPOSE:

To outline the Medication Error Reduction Plan & the Annual review of the MERP plan

II. REFERENCES:

TJC Standards LD.01.03.01, LD.03.01.01, LD.03.02.01, LD.03.05.01, LD.04.04.01, MM.06.01.01, MM.07.01.03, MM.08.01.01, PI.01.01.01, PI. 02.01.01, PI.03.01.01

CMS CoP § 482.11(a), 482.12(b)(d)(f), 482.21(a)(b)(c)(d)(e), 482.23(c), 482.25(a)(b), 482.41(c), 482.42(b)

California SB 1875

III. POLICY:

SB1875 requires an annual review of all MERP elements for efficacy. There are twelve different 'elements' to the medication management process that require monitoring: Prescribing, Prescription Order Communication, Product Labeling, Packaging, and Nomenclature, Compounding, Dispensing, Distribution, Administration of Medications, Monitoring, Education, Use, Technology, and Transitions in Care.

IV. PROCEDURE:

Below is a breakdown, by element, of the monitors in place at CCRMC. This is a multidisciplinary process, with many departments involved/responsible for the monitor/audit/report.

1. Prescribing:

- Medication errors: review and analysis of all medication errors involving prescribing
- Adverse Drug Events: review and analysis of all reported adverse drug events
- Pharmacy interventions: review and analysis of all reported pharmacist interventions with providers
- Antibiotic stewardship: report on appropriate prescribing and monitoring of antibiotic therapy

- Fentanyl patch: review of all fentanyl patch orders for appropriateness of therapy and monitor of provider prescribing process
- Rescue medications: review of 100% of all doses of rescue medications administered to patients
- LASA review: review of latest literature on LASA and report on all CCRMC medication errors involving look-alike-sound-alike errors

2. Prescription Order Communication:

- Medication errors: review and analysis of all medication errors involving order communication

3. Product Labeling, Packaging, and Nomenclature:

- Medication errors: review and analysis of all medication errors involving labeling, packaging, and nomenclature
- Internal pharmacy audit: monthly audit of pharmacy-dispensed doses, looking for proper labeling, ingredients, cart fill check, etc
- LASA review: review of latest literature on LASA and report on all CCRMC medication errors involving look-alike-sound-alike errors

4. Compounding:

- Medication errors: review and analysis of all medication errors involving compounding
- Internal pharmacy audit: monthly audit of pharmacy-dispensed doses, looking for proper labeling, ingredients, cart fill check, etc.
- End-Product-Testing

5. Dispensing:

- Medication errors: review and analysis of all medication errors involving dispensing
- Internal pharmacy audit: monthly audit of pharmacy-dispensed doses, looking for proper labeling, ingredients, cart fill check, etc
- Turn-Around Time: monitor of pharmacy TAT
- LASA review: review of latest literature on LASA and report on all CCRMC medication errors involving look-alike-sound-alike errors

6. Distribution:

- Medication errors: review and analysis of all medication errors involving distribution.

- Internal pharmacy audit: monthly audit of pharmacy-dispensed doses, looking for proper labeling, ingredients, cart fill check, etc
- High risk/high alert: review of latest literature on high-risk medications and report of all medication errors involving high risk medications
- LASA review: review of latest literature on LASA and report on all CCRMC medication errors involving look-alike-sound-alike errors

7. Administration of medications:

- Medication errors: review and analysis of all medication errors involving administration of medications
- Bar code report: report on medications being administered without proper barcoding.
- Alaris pump report: report on improper use of Alaris pump
- Override report: monitor of medications removed from the automated dispensing machine using the override function
- LASA review: review of latest literature on LASA and report on all CCRMC medication errors involving look-alike-sound-alike errors
- CADD pump report: report on use of CADD pump

8. Monitoring:

- Medication errors: review and analysis of all medication errors involving monitoring of medications
- Antibiotic stewardship: report on appropriate prescribing and monitoring of antibiotic therapy
- Pharmacist-managed Diabetes Care Management Clinic: review and analysis of patient outcomes for pharmacist-managed diabetes patients vs provider-managed diabetes patients.
- Anticoagulation clinic
- Erythropoetin stimulating agent clinic
- Pharmacy interventions (including but not limited to daily drug information, clinical monitors set via Datamining software as well as EHR)
- D50 Use Review
- Medication overrides
- Medication barcoding
- Medication extraction from the nighlocker after hour
- Controlled substance discrepancy
- Medication pass audit of the hospital units
- Pharmacy practices internal audit
- Review of Rescue medications

- Adverse Drug Events: review and analysis of all reported adverse drug events

9. Education:

- Medication errors: review and analysis of all medication errors with regards to competency of staff
- Patient education on fentanyl patch: review and monitor for documentation of patient education for all patients being discharged on fentanyl patch
- Professional Development Department provides ongoing education for nursing staff
- Transitions of Care program by pharmacy department: Admission medication reconciliation and discharge medication reconciliation for patients deemed as "High Risk," per defined criteria.
- Anticoagulation clinic program run by Pharmacy Dept (Ambulatory care, Healthcenters)

10. Use:

- Medication errors: review and analysis of all medication errors related to medication use
- Antibiotic stewardship: report on appropriate prescribing and monitoring of antibiotic therapy
- Fentanyl patch: review of all fentanyl patch orders for appropriateness of therapy and monitor of provider prescribing process

11. Technology:

- Medication errors: review and analysis of all medication errors related to technology
- Alaris pump report: report on improper use of Alaris pump
- ccLink: reports on system changes made in response to system issues
- CADD pump report: report on use of CADD pump
-

12. Transitions in Care:

- Medication errors: review and analysis of all medication errors related to transitions in care
- Transitions of Care program by pharmacy department: Admission medication reconciliation and discharge medication reconciliation for patients deemed as "High Risk," per defined criteria.

An annual report on the effectiveness of the plan, illustrated by the annual medication errors and metrics associated with each element is prepared and presented to the Medication Safety Committee, Patient Care Policy & Evaluations Committee and the Performance Improvement Committee, and the Medical Executive at the end of the MERP year. The plan is then modified, based on the findings, for the following year and adopted by the organization.

V. Attachment:
Annual MERP Review
MERP Plan 2022

VI. RESONSIBILITY:

Director of Pharmacy Services

Reviewed: 3/14, 3/16, 3/18, 3/19, 3/20, 3/21, 3/22
Revised: 3/14, 3/16, 3/18, 3/19, 3/21, 3/22

MEDICATION ERROR REDUCTION PLAN-ANNUAL MERP REVIEW

CONTRA COSTA REGIONAL MEDICAL CENTER (3/2022-3/2025 cycle)

Approval	Signatures	Date
Chief Executive Officer		**3/2022**
Chief Medical Officer		**3/2022**
Chief Nursing Officer		**3/2022**
Director of Safety and Performance Improvement		**3/2022**
Medical Executive Committee		**3/2022**
Patient Safety and Performance Improvement Committee		**3/2022**
Patient Care Policy and Evaluation		**3/2022**
Governing Body		**3/2022**
Director of Pharmacy Services, Medication Safety Committee		**3/2022**

Policy (5013)

The Medication Error Reduction Plan submitted to CDPH in 2001 as a facility plan to eliminate or substantially reduce medication-related errors (by authority of SB1875/801) and Health & Safety code 1339) has been incorporated in this policy.

Annual review of the effectiveness of the plan will be performed depicted in the MERP grid. If the plan is not effective in reducing medication errors, MERP will be revised to redesign actions and achieve goals.

Background

CDPH shall monitor the implementation of the plan upon licensure visit every three years.

CCRMC cycles per CDPH audits: started in 2009 and repeats every three years.

MEDICATION ERROR REDUCTION PLAN-ANNUAL MERP REVIEW

CONTRA COSTA REGIONAL MEDICAL CENTER (3/2022-3/2025 cycle)

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MEDICATION ERROR REDUCTION PLAN-ANNUAL MERP REVIEW
CONTRA COSTA REGIONAL MEDICAL CENTER (3/2022-3/2025 cycle)

I. INTRODUCTION

The following is Contra Costa Regional Medical Center (CCRMC) and Healthcenters' plan (HC) to eliminate or substantially reduce medication-related errors as part of Senate Bill 1875/ 801 and Health & Safety Code 1339 (MERP).

A. CONTRA COSTA REGIONAL MEDICAL CENTER AND HEALTHCENTERS MERP

Contra Costa Regional Medical Center is a 167 bed county hospital located in Martinez California. We are directed and guided by established policies and procedures, protocols and guidelines to minimize medication errors and adverse drug events. Events are reported through an electronic event reporting system (SERS), a voluntary, non-punitive reporting system for all problems/risk issues identification, and preventive action designed for implementation to reduce errors or potential risks. Medication safety initiatives were developed in 2001. Over the years we have incorporated into our medication safety and quality system risk reduction requirements from Federal and State Laws, including but not limited to CMS, CDPH, FDA, other governmental agencies, TJC standards; National Patient Safety Goals & TJC Booster Pack, applicable clinical practice guidelines and recommendations from nationally recognized organizations (e.g., ISMP, The Medical Letter, etc…), professional societies and associations (e.g., ASHP, CSHP, APhA, ADA, etc…) as well as shared learnings from any external resources with successful medication practices demonstrated in reducing medication errors and adverse drug events.

B. VISION

To be the health care system of choice in Contra Costa County where partnerships with patients and employees exist to promote individuals and community wellness.

C. MISSION

The mission of Contra Costa Health Services is to care for and improve the health of all people in Contra Costa County with special attention to those who are most vulnerable to health problems.

- We provide high quality services with respect and responsiveness to all.
- We are an integrated system of health care services, community health improvement and environmental protection.
- We anticipate community health needs and change to meet those needs.
- We work in partnership with our patients, cities and diverse communities, as well as other health, education and human service agents.
- We encourage creative, ethical and tenacious leadership to implement effective health policies and programs.
- We have a department-wide goal to reduce health care disparities and health disparities by addressing issues of diversity and linguistic and cultural competence

D. VALUES

Respect, Safety, Learning, Honesty, Excellence, Functional, Communication, Stewardship, Creativity, and Compassion.

E. STRATEGIC DIRECTIVES

CCRMC and Clinics use a system-wide approach to identify high risk and problem prone patient and care processes, redesign unsafe care processes, implement best practices, and adopt successful practices from other organizations that will improve and ensure patient safety. Our goal is to increase the safety of patients receiving medications at CCRMC and Clinics.

II. OVERVIEW OF CCRMC's MERP

A. SCOPE OF THE MEDICATION ERROR REDUCTION PLAN

1. Ensuring provision of pharmaceutical services meet the patient's therapeutic goal by improving safe medication use processes that optimize therapeutic outcomes
2. Ensuring the safe administration of medications according to physician's orders
3. Ensuring compliance with regulatory requirements related to medication safety and security throughout the hospital

4. Reviewing, analyzing, and trending medication errors and adverse drug events (i.e., Adverse Drug Reactions as well as medication errors), and identifying processes and practices which require improvement
5. Implementing evidence-based practices in medication administration, medication safety and security, and improved technologies and pharmaceuticals

B. GOAL AND OBJECTIVE

Our objective is to increase effectiveness in the implementation of evidence-based medication practices shown to reduce preventable adverse medication events. Medication safety will be improved through compliance with medication error reduction standards and safety practice implementation required by CMS, CDPH, FDA, Board of Pharmacy, TJC and its National Patient Safety Goals as well as Booster Pack.

- Development and revision of policies and procedures and protocols to minimize Adverse Drug Events (ADE) will be based on review of facility reported adverse drug events, medication use evaluation, chart reviews, observed medication passes, accepted professional principles, incorporation of Federal & State laws and regulations, TJC medication management standards and National Patient Safety Goals, its Booster Pack as well as its Sentinel Event Reports, other external alerts and/or recommendations from national associations including but not limited to the Institute For Safe Medication Practices (ISMP), National Coordination Council for Medication Error Reporting and Prevention (NCCMERP), Institute of Healthcare Improvement (IHI), other governmental agencies such as FDA Medwatch program, as well as clinical practice guidelines and standards of practice from nationally recognized professional organizations (e.g., American Pharmaceutical Association (APhA), American Society of Healthcare Systems Pharmacists (ASHP), California Society of Healthcare Pharmacists (CSHP), etc.

Our processes include but are not limited to the following:

1. Identify the causes of preventable Adverse Drug Events (ADE)
2. Identify the causes of preventable Rescue medications
3. Implement selected short-term changes, as well as
4. Identify, evaluate and implement long-term strategies that require operational and capital expenditures that will ensure safe medication processes and systems with or without technology.

C. ACTION PLANS AND INITIATIVES

See MERP Grid for an updated medication safety QA/PI project list, demonstrating numerous medication safety goals, initiatives, and medication related best practices. Our priority is to achieve continual implementation of safe medication practices to substantially reduce medication errors and/or proactively prevent adverse events by addressing issues, actual or potential risk points or deficiencies associated with CDPH MERP elements.

III. ORGANIZATIONAL RESPONSIBILITY AND ACCOUNTABILITIES

(DHS-CDPH guiding principle #1-Establish an organized quality system that addresses the issue of a facility wide reduction of medication errors)

1. CCRMC has an ongoing approved and leadership-supported Medication Error Reporting Program with policies and procedures which clearly establish organizational structure in providing the leadership and quality system in advancing patient safety, risk management, and error reduction. Approved policies and procedures establishing our medication management and quality system are continually addressing issues in improving and refining processes, based on what went wrong, to design corrective actions for implementation and prevent re-occurrence.
2. Under the oversight of the PCP&E, a multidisciplinary Medication Safety Committee was formed in 2001. The Medication Safety Committee (MSC), run by the Department of Pharmacy (SEE

Addendum I), has oversight on all medication management processes, system wide. MSC is a subcommittee of the Patient Care Policy and Evaluation Committee (PCP&E) and reports to several medical staff committees i.e., PCP&E (i.e, P&T), PS&PIC, and MEC on a monthly basis. MSC oversees/addresses ALL medication errors and meets on a multidisciplinary note, every month, to discuss in detail all medication errors that occurred during that month. Medication errors are trended using NCCMERP ratings and through ongoing data aggregation analysis and preventative action design. In addition, at CCRMC, Pharmacy Dept trends near misses as well as harm index (see SBARs in MERP binder or electronic MERP document).

3. The MERP plan for the upcoming year is drafted annually submitted to executive members of this organization as well as medical staff committees (PCP&E, PS&PIC, and MEC) once MSC endorses it.
4. This committee is Chaired by the Director of Pharmacy Dept. The quality of different services in ensuring compliance with all MERP elements and established hospital policies is assessed and monitored via data collection. (See Annual Medication Error Reports in the MERP binder).
5. MSC has oversight on all medication related processes and generates many reports, including but not limited to Medication Errors, Rescue Meds, CSPs (Compounding Sterile Products), Clinical Monitors, Alaris® pump, Overrides, Pharmacy Department's Performance Improvement projects, ADRs, and ISMP reports.
6. Medication error reports and adverse drug reaction reports with executive summary and pertinent data feedback relative to the user/user department are sent/referred to relevant medical staff, nursing unit/departments. Action response is requested from unit management/department head before SERS is closed.

7. Feedbacks on medication safety initiatives are reported to the Medical staff as well as Nursing staff through leadership of these departments.
8. A summary of all MSC agenda items are reported to PCP&E, PS&PIC as well as MEC. The Director of Pharmacy Department is a member of all these committees and presents the report on all pertinent information on a monthly basis to the aforementioned committees.
9. Implementation of our MERP is integrated into the facility-wide quality assurance/performance program.
10. Ongoing educational efforts are in place to heighten the awareness of medication safety to our patients.

IV. REPORTING SYSTEMS AND MONITORING

(DHS-CDPH guiding principles #2-Develop effective reporting mechanisms to ensure medication related errors are reviewed)

Reduction of medication errors and adverse reactions can be achieved by effective reporting systems that proactively identify causative factors and are used to implement corrective actions to reduce or prevent reoccurrences. To facilitate reporting, CCRMC adopted a medication error definition that is broad enough in scope to capture actual, potential, or “near miss” events and an adverse drug reaction (ADR) definition to capture suspected as well as actual ADRs.

CCRMC conducts proactive identification of adverse drug events or unsafe care processes including concurrent and retrospective review of patient’s clinical records, monitoring of targeted high-risk drugs with pertinent lab results, observing medication passes, conducting drug use evaluation and drug regimen review for high-risk patients for drug and or dosage adjustment to

prevent potential adverse drug events, as well as performing other QA/PI initiatives as listed in MERP grid.

At CCRMC the Pharmacy Department believes in transparency and uses our event reporting system (SERS) to place in all near misses as well as discrepancies. Pharmacy Department believes that SERS is a means of trending and alerting healthcare members of the ongoing challenges in the system. In addition, Pharmacy Department uses analyzed data as a means of identifying QA and PI projects. See MERP Grid for examples of system enhancement projects using this methodology by the Pharmacy Department.

Pharmacy Department is the biggest contributor to SERS entry in the organization. All relevant data from our monitors and reports are entered into this system on a concurrent and retrospective basis. Through subsequent follow up with Nursing, Medical Staff, and Quality departments, we have been able to overcome many medication safety challenges in the past few years.

A. CCRMC has a voluntary, non-punitive reporting system to monitor and report Adverse Drug Events (ADE) via a long-standing effective medication error reporting as well as an Adverse Drug Reaction program (ADR) with data collection, aggregation, analysis, and special emphasis on designing and implementation of preventative actions on an ongoing basis.

B. Medication events, actual, potential, or near misses are reviewed and trended to evaluate changes in our systems that could improve patient safety. Evaluation and implementation of medication safety initiatives follow our continuous quality improvement process using the PDSA (Plan-Do-Study-Act) model, the Rapid Cycle Improvement techniques, the Failure Mode and Effect Analysis (FMEA), and the Root Cause Analysis (RCA) model for sentinel event or “near misses” in conjunction with our Quality department / Risk management & Patient Safety Officer.

V. PROCESS-MERP IMPLEMENTATION ASSESSMENT

A. ASSESSMENT

(DHS-CDPH guiding principle #3- Establish a baseline assessment and then, at a minimum annually review the effectiveness of the plan to reduce medication-related errors)

Baseline assessment of medication related problems and annual review of the effectiveness of the plan are performed using an objective based critical review. If the plan is not effective in reducing medication errors, MERP will be revised to redesign actions to achieve goals.

B. CDPH REQUIREMENT IN ASSESSING EFFECTIVENESS OF MERP IMPLEMENTATION:

Evaluate, assess, and include a method to address each of the procedures and systems listed under 1339, H&S, subdivision (d) to identify weaknesses or deficiencies that could contribute to errors in the administration of medications. CDPH categorized and focused on evaluating twelve elements on MERP implementation for ongoing improvement.

At CCRMC we use our medication error reports to trend challenging elements. Medication errors are reviewed periodically (i.e., monthly, quarterly, and annually).

The following year's plan is drafted after meticulous review of all Medication Errors, analyzing the cumulative data using monthly, quarterly, and annual Med Error patterns. Subsequently thereafter, plans are implemented to reduce the likelihood of the errors in those certain areas.

Pharmacy Dept uses the Run Chart methodology to graph each MERP element to assess the effectiveness of the instituted plans and whether those plans were adequate in reducing medication errors over time.

Run Charts are cumulative; using Median Line, we can detect any trends, shifts, or astronomical data points. We also insert annotations on the aforementioned run charts to be able to describe the cause and effects concerning any peaks or trough vs any observed isolated incidents.

Pharmacy Dept works very well with ALL departments (Nursing, medical staff, or ancillary departments) in conjunction with Quality Managers and the Professional Development Department (PDD) to apply corrective actions. Success is measured by following SERS in the affected areas to see if the action plan was proven effective or not and reflected on the run charts as cited above.

Education and Information dissemination

1. CCRMC disseminates information to hospital leadership, physicians, nurses, pharmacists, and quality managers. The following activities are currently underway to increase awareness of patient safety:
    a. Data feedback to physicians by Pharmacy Department's leadership on medication errors, adverse drug reaction reporting and medication use quality assurance and use audits.
    b. Data feedback to nursing by Pharmacy Department's leadership on medication errors, rescue meds, adverse reactions, and quality audits.

    At CCRMC we have actively received and used new information and notices related to:

    - Medication errors
    - Processes for avoiding errors
    - Recalls

- Problem prone medications and
- Resources related to adverse events associated to medications.

A monthly memo is generated by the Pharmacy Department with all the PCP&E updates. In addition, a memo is generated and sent to the Medical Staff president regarding "Preventable ADRs as well as Preventable Rescue Meds as a learning and educational opportunity.

Technology Strategies

(DHS-CDPH guiding principle #4-Technology implementation shall be part of the plan)

Technology will be used whenever possible to improve effectiveness and efficiency in the medication use processes to make errors difficult to commit and to promote a culture of safety and quality in the workplace. Listed below are technological applications completed at CCRMC.

Technology action plan:

1. Automated Dispensing Cabinets (i.e, Omnicell)
   - Continue using the alerts, reports, and paging system available by the Omnicell software
2. Continue using Repackager (Omnicell) to minimize medication errors in form of medication Unit Dosing and distribution to Nursing units
3. Provide ongoing support to maintain quick access and availability to medical information or current IV administration guidelines, online:
   - Micromedex-available to all staff
   - Lexicomp- available to all staff

4. Expanding reporting capabilities of EPIC (our EHR) to generate more and more meaningful reports in form of system lists, workbench reports, or crystal reports.
5. Usage EHR, i.e, ordersets, Best Practice Alerts (BPA's), First Data Bank (FDB) warnings (i.e., concerning allergy, Drug-Drug Interaction, high dose, etc…) enables us to ensure safe medication practices at CCRMC.
6. Utilizing different software and technologies to extract data and trend values
7. VigiLanz (A data mining system)
    - VigiLanz is programmed to include many monitors. It filters the data and reports all monitors that need to be addressed by the pharmacists on a daily basis
8. SERS (Safety Event Reporting System)
    - Electronic event reporting system with the built in reporting mechanism
9. Alaris® Pump (i.e, Smart pump)
    - Smart pump has been programmed to match our EHR rates of administration for all formulary drugs. The use of basic infusion is monitored and use of guardrail is encouraged. Alaris® committee is a subcommittee of MSC that meets every month. Data is trended using its report functionality. Rounds are made by Pharmacy and Nursing to assure compliance with set safety parameters.
10. Kitcheck®
    - Kit check® uses the RFID technology. Pharmacy Dept uses this technology to improve the efficiency of monitoring the expired medications in variety of kits and carts.

- Kit Check® technology was instituted in Anesthesia Workstations to better manage the inventory of the trays.

11. HER (ccLink)
    - Barcoding technology
        - Introduced globally as BCMA
        - Introduced departmentally in most areas of the Pharmacy dept
    - Antimicrobial Stewardship (ASP) module
12. Central Temperature monitoring software

C. Literature review for ongoing review of the plan

(DHS-CDPH guiding principle #5- Review pertinent literature related to the reduction of medication related errors in the development and ongoing review of the plan.)

Pertinent literature related to the reduction of adverse drug events has been and will continue to be reviewed in the development and review of the plan. The ultimate goal is to deliver safe medication practices at CCRMC and Clinics.

Literature for ongoing learning and sharing are readily obtained from any of our resources at CCRMC. We have a very generous library of resources made available to staff, electronically. A few examples would be Micromedex, Up-To-Date, and many journals through our library. In addition to that, we benefit from nationally recognized entities and their publications such as ASHP, FDA Medwatch alerts, etc… (SEE Goal and Objective section above)

D. CCRMC participates in the following medication safety collaborative for learning from errors and sharing of best practices:

- East Bay Society of CSHP (California Society of Healthcare Pharmacists): Collaboration of all East Bay Pharmacy Leadership
- South Bay Society of CSHP (California society of Healthcare Pharmacists): Collaboration of all South Bay Pharmacy Leadership
- ARC-Gordon and Betty Moore foundation: Avoid Readmission Coalition. Pharmacy Director has done a number of presentations for this organization and currently is the expert speaker/presenter for Avoid Readmission Campaign in the East Bay
- ISMP Canada: Pharmacy Director has been invited to ISMP in Canada to share the Medication Reconciliation Process at CCRMC as IHI model hospital
- Sharing ADE data with Vizient Hospital Innovation Improvement Network (HIIN) to assess how CCRMC ADEs compares with other hospitals in that network

VI. MERP ELEMENTS OF THE PLAN TO MONITOR AND EVALUATE SAFE MEDICATION PRACTICES IN ERROR REDUCTION:

The main section of this report will be categorized by the twelve elements of medication practices: Prescribing, Dispensing, Distribution, Administration, Competency related to medication use, Product-labeling, Packaging and Nomenclature, Compounding, Prescription Order Communication, Monitoring, Use, and Transition of Care.

The annual MERP program assessment review and effectiveness evaluation in support of identifying plan weaknesses and deficiencies for change implementation and MERP program modification are highlighted in our MERP Grid.

Processes to Reduce Medication Errors:

Methodologies to reduce medication errors include on-going proactive surveillance and retrospective tools to identify the root causes of variation or deviation in medication management

process and system performance. Examples of on-going proactive surveillance tools include the use of trigger tool to identify areas for improvement in clinical care and patient safety, the reviews of medication usage evaluations, and daily monitoring of Automated Dispensing Cabinets medication overrides.

Data from comprehensive review of reported medication events and on-going proactive and retrospective reviews of system performance will be utilized to determine and evaluate medication safety systems related to, but not limited to: prescribing, prescription order communication, product labeling, packaging and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, medication use and storage of medications.

Corrective actions are promptly initiated to address each of the eleven processes and systems once a significant trend or pattern has been identified through the on-going monitoring methodologies as described above. Corrective actions may include changes in systems, procedures, staff and management in-services, and revision in policies and procedures. Should the corrective actions as implemented prove to demonstrate a decrease or reduction in medication errors overtime, then the specific hospital policy and corresponding procedures will be revised and forwarded to the Medication Safety Committee (MSC) as well as the oversight committees (i.e, PCP&E, etc…) for review and approval.

Annually, all the revised and changed procedures and systems will be reviewed and evaluated by the MSC as well as PCP&E to determine if the changes undertaken have been effective, or not; and whether the ongoing indicator should continue to be monitored for the forthcoming year.

Frequency of monitoring for the specific indicator that has demonstrated a reduction in medication errors will also be revisited and determined by the Medication Safety Committee and approved by the PCP&E Committee.

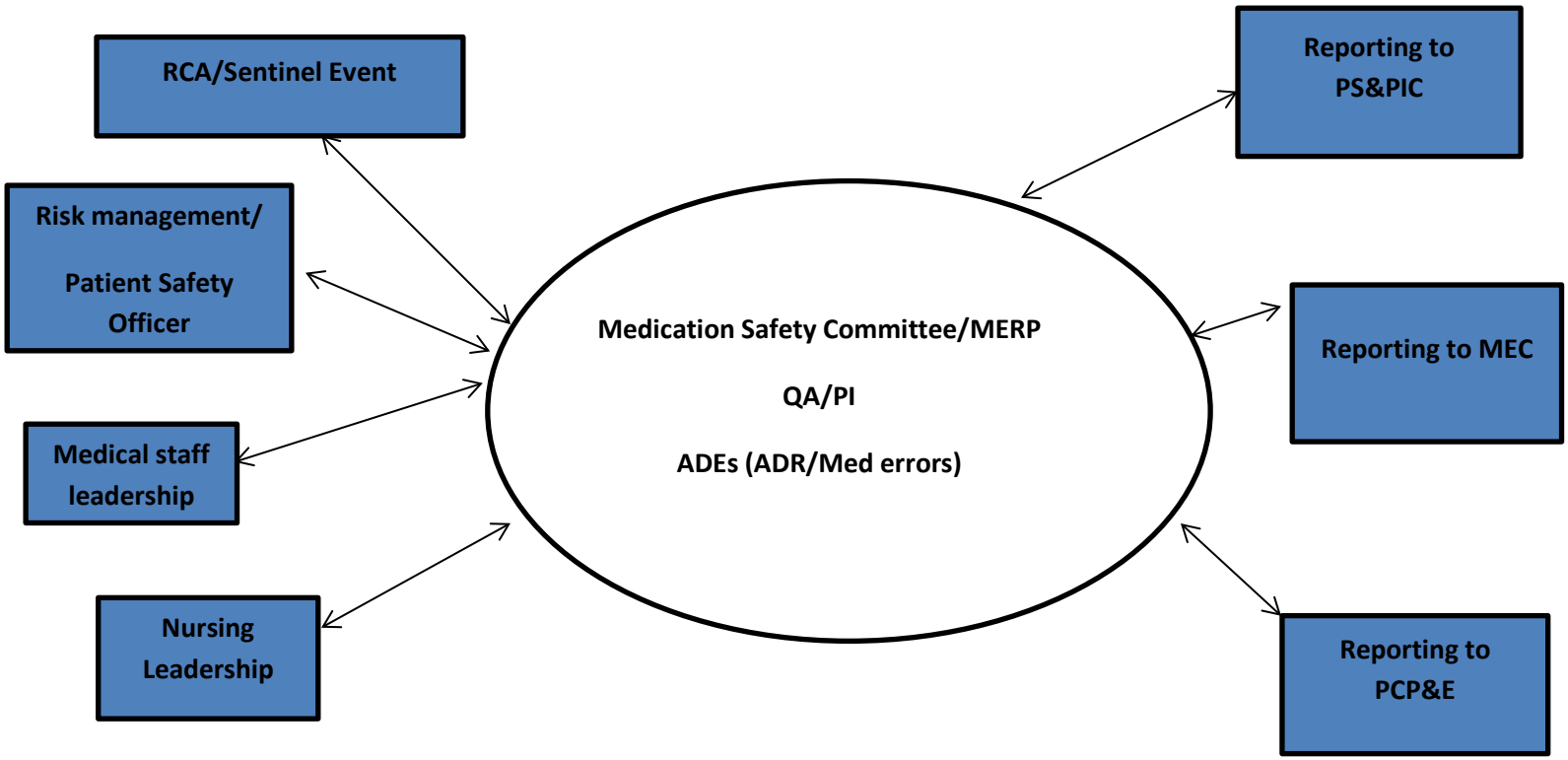
VII. MERP GRID:

See MERP binder and/or electronic files with hyperlinks to data analysis and reports.

VIII. Effectiveness of the Plan:

The program has been effective in detecting medication errors and in developing corrective actions for the past year (see MERP grid).

Addendum I- Pharmacy Department's QA/PI collaborative structure



(Policy: 5013)