Research and Academics in KP California Emergency Medicine
Quarterly Report: 2018 Q3

Table of Contents
- New Publications 1-4
- In Preparation for IRB Submission 4-6
- Newly Approved Studies Just Launched 6-7
- Ongoing Projects 7-22
- Recent Publications (just since Jan 2018) 22-26

Hot Off the Press

TPMG (Northern CA)

CREST Network Honored with Morris F. Collen Research Award

Article: https://spotlight.kaiserpermanente.org/kp-emergency-services-physicians-honored-for-research/

Video: https://tpmgawards.kaiserpermanente.org/collen-research/2018/dustin-ballard-md-mbe/


Abstract: https://www.annemergmed.com/article/S0196-0644(18)30968-5/fulltext


Full-text: https://journals.lww.com/em-news/Fulltext/2018/09000/Medically_Clear__New_Immunotherapy_Revolutionizes.15.aspx

a Publications, including abstracts and educational works, are organized by the region of the leading TPMG/SCPMG emergency physician author, whose name is the first one in bold font. We also highlight all KP EM co-authors.

Included are activities undertaken during PMG employment. Updates for coming quarterlies can be sent to David R Vinson, KP CREST Network: drvinson@ucdavis.edu

Full-text: https://journals.lww.com/em-news/fulltext/2018/07000/Medically_Clear__Medical_Therapy_Shows_Promise.5.aspx


Full-text: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6080076/


Amazon: https://www.amazon.com/dp/1107153158/


Link: https://www.ncbi.nlm.nih.gov/pubmed/30118361


Abstract: https://www.annemergmed.com/article/S0196-0644(18)31115-6/fulltext


Abstract: https://www.annemergmed.com/article/S0196-0644(18)30814-X/fulltext


Full-text: [https://rdcu.be/2ZP6](https://rdcu.be/2ZP6)


Full-text: [https://www.onlinecjc.ca/article/S0828-282X(18)30250-2/fulltext](https://www.onlinecjc.ca/article/S0828-282X(18)30250-2/fulltext)


Full-text: [https://journals.lww.com/em-news/Fulltext/2018/07000/Emergentology__Ten_Years_In.9.aspx](https://journals.lww.com/em-news/Fulltext/2018/07000/Emergentology__Ten_Years_In.9.aspx)


Full-text: [https://journals.lww.com/em-news/Fulltext/2018/08000/Emergentology__Lies__Damned_Lies__and_Sepsis.15.aspx](https://journals.lww.com/em-news/Fulltext/2018/08000/Emergentology__Lies__Damned_Lies__and_Sepsis.15.aspx)


Full-text: [https://journals.lww.com/em-news/Fulltext/2018/09000/Emergentology__New_Sepsis_Bundle_is_Built_on_Good.12.aspx](https://journals.lww.com/em-news/Fulltext/2018/09000/Emergentology__New_Sepsis_Bundle_is_Built_on_Good.12.aspx)

**SCPMG (Southern CA)**


Abstract: [link.springer.com/article/10.1007%2Fs13181-018-0670-8]


Abstract: [doi.org/10.1093/eurheartj/ehy565.1090]


Abstract: [www.annemergmed.com/article/S0196-0644(18)30767-4/fulltext]


Abstract: [www.annemergmed.com/article/S0196-0644(18)30990-9/fulltext]

**In Preparation**

1. **Sustainability of electronic clinical decision support system effects: an evaluation of two use cases**

   Principal Investigator: Dustin W. Ballard (San Rafael)

   Co-Investigators: David R. Vinson (Sacramento/Roseville), Mary E Reed, DrPH (DOR), and the KP CREST Network

   Funding: KPNC Community Benefit Program

   KP Study Sites: KPNC

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b Pending approval by our respective Institutional Review Boards
Summary: Evidence supporting the effectiveness of electronic clinical decision support systems (CDSSs) is accumulating across condition-specific indications but is lacking in regards to the sustainability of CDSS-impacted practice change. Emergency Department (ED) CDSS implementation within the KPNC electronic health record has been proven effective with active intervention promotion, however further evaluation is needed to guide recommendations regarding the optimal duration and characteristics of such promotional efforts. We will assess the sustainability of CDSS-enabled practice change across two distinct ED use cases: 1) site-of-care treatment decisions for patients with acute pulmonary embolism (PE) and 2) imaging guidance for children with blunt head trauma. We propose extending and enhancing the analysis of two distinct CDSS interventions encompassing different intervention time periods (2012-2014 vs. 2014-2015), patient populations (adult vs pediatrics), intervention sites (7 vs. 10) and interfaces (Epic flowsheet vs. RISTRA web services).

2. Utilization of CT pulmonary angiograms for pulmonary embolism evaluation: predictors of higher yield and comparison to national rates

Principal Investigator: Mamata V. Kene (San Leandro/Fremont)

Co-Investigators: Dana R. Sax (Oakland/Richmond), David R. Vinson (Sacramento/Roseville), Mary E Reed, DrPH (DOR), and the KP CREST Network, along with Vignesh Arasu (Radiology, Vallejo)

Funding: KPNC Community Benefit Program

KP Study Sites: KPNC

Summary: We propose a retrospective cohort study of KPNC ED patients receiving CT pulmonary angiography (CTPA) from 2012-2018 to evaluate CTPA yield (the percentage of studies positive for PE) compared to national averages. We hypothesize that the CTPA yield will be higher in KPNC compared with non-integrated delivery systems, and will identify provider-, facility- and patient-level factors associated with CTPA use and yield rates. We will also examine changes in CTPA yield after publication of professional society guidelines on risk stratification prior to CTPA in suspected PE. Finally, we will apply natural language processing techniques to identify whether risk stratification tools were documented in the record. The results of this study will inform future design of prospective clinical decision support for PE diagnostics that will facilitate risk stratification tool use prior to imaging ordering in hopes of optimizing CTPA use, with improvements in patient care, resource use, and department throughput.

3. Dissemination and implementation of a shared decision-making strategy in ED patients with possible acute coronary syndrome: the patient-centered chest pain pathway

Principal Investigators: Erik Hess (Univ of Alabama, Birmingham; Mayo Clinic) and Dustin G. Mark (Oakland/Richmond)

Co-Investigators: Uli Chettipally (South San Francisco), Dustin Ballard (San Rafael), David R. Vinson (Sacramento/Roseville), Adina S. Rauchwerger (DOR), and the KP CREST Network
Funding: Patient-Centered Outcomes Research Institute (PCORI)

KP Study Sites: Oakland, Richmond, San Rafael, and South San Francisco

Summary: This project will engage patients and key stakeholders in refining and embedding the Chest Pain Choice decision aid in routine emergency care. We will identify key barriers and facilitators to broad uptake of Chest Pain Choice that will result in a bundled pathway-driven strategy ready for implementation in 6 U.S. EDs representing 3 large integrated systems. The project will assess the extent to which the decision aid reaches all eligible patients, safely improves the patient experience of care (increase patient knowledge, increase patient satisfaction, decrease decisional conflict), and affects 30-day healthcare utilization.

4. Young children presenting to the ED with food allergy reactions: triggers, treatment, healthcare utilization, and outcomes

Principal Investigator: Jimmy Ko (Allergy, OAK)

Co-Investigators: Dana R. Sax (Oakland/Richmond)

Funding: KPNC Community Benefit Program

KP Study Sites: KPNC

Summary: In this retrospective cohort study, we will describe rates of ED visits and hospital admissions for food allergy (FA) in children <5 years of age from 2016-2018 and assess for differences by patient demographics. We will also identify predictors of more severe FA reactions, defined as hospital admission, anaphylaxis, or pre-hospital or ED epinephrine use, using multiple logistic regression. We hypothesize that ED FA visit rates increased over the study period, and that infants are less likely to have severe reactions compared to older children. This study will increase understanding of the morbidity and healthcare utilization of young children with FA and provide useful information to parents and physicians.

Recently IRB Approved

1. Analysis of the effect of fascia iliaca block on decreasing opiate use for patients with hip fractures using a multidisciplinary management pathway

Principal Investigator: Kenneth Perry (San Diego)

Funding: Regional Research Committee Grant Funded

KP Study Sites: San Diego

Summary: Hip fractures lead to millions of ED visits each year and are associated with significant morbidity and mortality. When sustaining a hip fracture, patients are often given opioid medications to control pain, which may lead to complications including altered mental status,
respiratory depression and hypotension leading to prolonged inpatient stays and increased morbidity and mortality. The fascia iliaca block using ultrasound guidance is an alternative to opioid pain medications by providing regional anesthesia to the areas of pain. It has been incorporated into a multidisciplinary pathway for pain management of hip fracture patients that present to the ED at Kaiser San Diego. The literature suggests that use of the fascia iliaca block may decrease the requirement for opioid medications and decrease length of stay.

2. KP-specific heart failure risk prediction: KPNC Standardizing Emergency Work-ups Around Risk Data (STEWARD) heart failure project

Principal Investigator: Dana R Sax (Oakland/Richmond)

Co-investigators: Dustin G. Mark and Jamal Rana (Oakland/Richmond), Mary Reed (DOR), Mamata Kene (San Leandro/Fremont), David R Vinson (Sacramento/Roseville), Dustin W. Ballard (San Rafael), and the KP CREST Network

Study Sites: KP Northern California

Funding: TPMG Delivery Science Program

Summary: There are over one million ED visits across the U.S. each year for acute heart failure (AHF), with an average admission rate of 84%. EDs play a major role in the care of AHF patients through symptom management, coordination of care, and risk stratification to identify sicker patients needing admission. A clinical decision support tool to help predict AHF disease severity, employing accurate KPNC-specific risk estimates, would allow for more informed recommendations around venues and intensity of care customized to the KPNC setting. We propose a retrospective cohort study of adult patients presenting to a KPNC ED between 2015-2017 with AHF to validate clinical decision tools and determine KPNC-specific risk estimates for 30-day serious adverse events. We will also assess the feasibility of an EHR-linked clinical decision support system to extract heart failure-relevant data and efficiently present these to ED providers.

Ongoing Research Projects

1. How effective are code leaders at determining high-quality cardiopulmonary resuscitation?

Principal Investigator: Steve A Aguilar (San Diego)

Study Site: San Diego

Summary: This is a prospective study where participants will be shown two separate randomly selected 1-minute videos from a cohort of four. Two of the videos will show examples of high-quality chest compressions while one will display a rate superseding current guidelines and the final will show poor chest recoil with a compressor partially leaning on the chest during compressions. We hypothesize that participants will generally be poor assessors of high quality

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c Active studies are organized alphabetically by the leading TPMG or SCPMG emergency physician investigator, whose name is in bold font.
chest compressions and hope that findings will generate interest in the importance of high-quality chest compressions during codes.

Status: Data collection complete. Manuscript written. Preparing for submission.

2. Does ACLS instruction utilizing high fidelity simulation and detailed video debriefing improve performance during critical scenarios?

Principal Investigator: **Steve A Aguilar** (San Diego)

Co-Investigators: Mark Meyer, Charles Chiang, So Onishi, and Mark Lettinga (all San Diego)

Study Site: San Diego

Summary: This is a non-randomized, pre/post study to determine if a new method of teaching ACLS improves performance during critical scenarios. Participants in an ACLS course are being taught using new AHA-approved simulation curriculum. Performance at baseline and post-debriefing are measured using specific tools to evaluate performance in a cardiac arrest scenario.

Status: The data are collected. Analysis is underway.

3. The Scene To Needle (STN) feasibility study of pre-hospital telestroke for patients with suspected acute stroke

Principal Investigators: **Dustin W Ballard** (San Rafael)

Co-Investigators: Jonathan Vlahos and Zita Konik (San Rafael), Jeff Klingman (Walnut Creek), Alexander Flint (Redwood City), Mary E Reed (DOR), Mai N Nguyen-Huynh (DOR), and the KP CREST Network

Study Sites: KP Northern CA

Funding: KPNC Community Benefit Programs

Summary: We propose a pilot feasibility study of a pre-hospital intervention in adult patients with suspected acute stroke. In eligible patients, a pragmatic cluster of Marin County Emergency Medical Services (EMS) providers will activate the Scene to Needle (STN) telemedicine protocol after initial assessment determines a patient meets acute stroke criteria. The STN protocol will utilize a video consultation in the ambulance between the patient, paramedics and regional Kaiser Stroke FORCE Doc (stroke neurologist) under the supervision of the Marin County EMS Agency (PI is the Medical Director). The FORCE Doc will confirm the diagnosis of stroke and, if the patient meets criteria, initiate the tPA treatment algorithm prior to ED arrival. We hypothesize that the STN intervention will prove feasible and minimally impact EMS on-scene and transport times.

Status: We presented at SAEM in May the results of our survey of EMS providers on their opinions on telehealth in the pre-hospital setting. Work and field testing with KP IT is currently on indefinite hold pending regional work to identify teleconsultation priorities and best practices.

4. EHR-based decision support for pediatric acute abdominal pain in emergency care

2018 3rd Quarter
Principal Investigator: Elyse Kharbanda, Health Partners, Minneapolis, MN

Co-investigators: Dustin W Ballard (San Rafael), Mamata Kene (San Leandro/Fremont), Uli Chettipally (South SF), David R Vinson (Sacramento/Roseville), Dale Cotton (South Sacramento), and the KP CREST Network

Study Sites: 11 CREST EDs in KPNC

Funding: National Institute of Child Health and Human Development (NICHD at the NIH)

Summary: With a cluster randomized trial we are studying the impact of patient-specific electronic clinical decision support on the use of diagnostic imaging, clinical outcomes and costs of care among children with abdominal pain at risk for appendicitis.

Clinical Trials: [https://clinicaltrials.gov/ct2/show/NCT02633735](https://clinicaltrials.gov/ct2/show/NCT02633735)

Status: The study will be ongoing at 11 KP EDs through early 2019. We have presented four abstracts at these conferences: Health Care Systems Research Network Conference, March 2017; Pediatric Academic Societies meeting, May 2017; and the American College of Emergency Physicians, October 2017. Our derivation and validation study of the pediatric Appendicitis Risk Calculator (pARC) was recently published in *Pediatrics*. We are working on a KP validation study, an abstract of which will be presented at the American College of Emergency Physicians in October in San Diego.

5. **Development and implementation of a computerized clinical decision support tool for the care of children in the ED with minor blunt head trauma**

Principal Investigators: Peter Dayan (Columbia) and Nate Kuppermann (UC Davis) with PECARN

Co-investigators: Dustin W Ballard (San Rafael) with the KP CREST Network

Funding: Health Resources and Services Administration, US Dept of Health and Human Services

Study Sites: Northern California (8 EDs), along with 8 non-KP EDs

Summary: This federally-funded trial investigated whether the active electronic-health record-based implementation of the PECARN head injury rules (compared to passive diffusion) can safely decrease the use of cranial CT scans in children with minor blunt head trauma.

Status: The first study was published in *Pediatrics*. A second manuscript is undergoing peer-review by *Ann Emerg Med*.

6. **Field triage of head injured older adults taking anticoagulants or platelet inhibitors**

Principal Investigator: Daniel Nishijima (UC Davis)

Co-investigators: Andrew Elms and Steve R Offerman (South Sacramento), David R Vinson (Sacramento/Roseville), and others
Study Sites: Northern California (3 EDs), UC Davis, Sutter Hospitals (3), Mercy Hospitals (3), Methodist Hospital, Sacramento Regional EMS Agencies

Funding: Centers for Disease Control

Summary: Because anticoagulated patients have been excluded from large, prospective studies on head trauma, there are a number of gaps in knowledge within this high-risk patient population. Our proposal will evaluate three areas of focus to address these gaps in knowledge: (1) describing the burden of disease, (2) examining the accuracy of existing and novel methods of medication ascertainment and field triage criteria, and (3) evaluate the impact of trauma center triage on long-term neurological outcomes.

Status: The data collection is complete. We have published three papers so far in Prehosp Emerg Care, Ann Emerg Med, and J Neurotrauma. More studies are underway.

7. Incorporation of bedside point of care echocardiogram findings to the Pulmonary Embolism Severity Index (PESI) score

Principal Investigator: Dasia Esener (San Diego)

Study Sites: San Diego, Carolinas Medical Center

Summary: A prospective observational study examining the incidence of death or clinical deterioration within five days of acute PE diagnosis and within 30 days of diagnosis. Some evidence suggests that 1/3 of patients with low PESI scores have right ventricular (RV) dysfunction. The goal of this study is to incorporate bedside echo findings of RV dysfunction to the PESI score and follow short-term outcomes.

Status: Enrollment is underway.

8. Evaluating the incidence of contrast associated acute kidney injury in ED patients

Principal Investigator: Mamata Kene (San Leandro/Fremont)

Co-Investigators: Vignesh Arasu (Vallejo), Ajit Mahapatra (Santa Clara), Mary Reed (DOR\(^d\)), and the KP CREST Network

Study Sites: KP Northern California

Funding: KP Northern California Community Benefit Program

Summary: Recent studies of acute kidney injury (AKI) after IV contrast-enhanced computed tomography (CT) suggest that prior observational studies overestimate the incidence of contrast-associated AKI, and cast doubt on whether IV contrast is even associated with AKI. In this retrospective observational study we will evaluate AKI incidence among all adult ED patients with

\(^d\) DOR = KPNC Division of Research (Oakland) and DRE = KPSC Department of Research & Evaluation (Pasadena)
chronic kidney disease grades 3-5 undergoing CT with or without IV contrast. To account for differences in distributions of AKI risk factors between contrast and no contrast arms, we will apply propensity score matching before performing logistic regression analysis to evaluate whether contrast administration is associated with AKI.

Status: Data collection is underway.

9. Detection, treatment, and follow-up of unrecognized behavioral health problems in the ED

Principal Investigator: Mamata Kene (Leandro/Fremont)

Co-investigators: Stacy Sterling (DOR), David R Vinson (Sacramento/Roseville), and the KP CREST Network

Study Site: San Leandro Funding: Garfield Memorial National Research Fund

Summary: This prospective pilot study has two hypotheses: (1) Incorporation of a behavioral health consultant in the ED will improve the detection, treatment, and follow-up of unrecognized behavioral health problems; (2) This innovation in care delivery will also improve patient engagement in the healthcare process and improve the matching of healthcare resources to patient needs.

Status: We have revising our manuscript for a peer-reviewed journal.

10. A prospective observational study examining the effects of ocular euphorbia plant exposure

Principal Investigator: Jeff M Lapoint (San Diego)

Co-Investigator: Ryan Sarkaria (San Diego)

Study Site: San Diego

Summary: The sap from euphorbia plants is poisonous and can cause irritation when it contacts mucous membranes. This is a prospective observational study examining the long-term outcomes that occur in patients with ocular exposure to euphorbia plants.

Status: Manuscript is undergoing peer-review.

11. Factors contributing to false cardiac catheterization laboratory activations for patients with suspected ST-segment Elevation Myocardial Infarction (STEMI): Our three-year experience with a Heart Alert Protocol

Principal Investigator: Joel T Levis (Santa Clara)

Co-investigators: Philip C. Lee and Eleanor Levin (Santa Clara), Cesar Avila (Santa Clara/Stanford)

Study Site: Santa Clara
Summary: This retrospective chart review of all Heart Alert (Code STEMI) activations at a single medical center over a three-year period (2009-2011) will elucidate those factors which contribute to false Heart Alert Activations (e.g., presenting ECG, patient demographics, time of day/day of week of activation, symptom presentation, involvement of a cardiologist in decision to activate).

Status: The manuscript is under construction.

12. The approach to pediatric patients with suspected sepsis: a qualitative study

Principal Investigator: Sage Meyers, Children’s Hospital of Philadelphia (CHOP)

Co-investigators: James Lin (Santa Clara), John Morehouse and Jenna Timm (Richmond), and the KP CREST Network

Study Sites: Santa Clara, Oakland, Richmond

Summary: We are participating in a multicenter qualitative study to evaluate the perceptions of clinicians (nurses, midlevel providers, physicians) and hospital leaders (quality, patient safety, hospital administration) around the care of pediatric ED patients with suspected sepsis. Interviews will be conducted with participants to characterize assessment of facilitators and barriers to appropriate care. This information will be used to generate a testable hypothesis for potential implementation techniques to improve compliance with sepsis care guidelines.

Status: Interviews are complete. Analysis is underway.

13. Do carbon monoxide levels rise in firefighters during overhaul operations following a structure fire?

Principal Investigator: Todd Filgrun (Sacramento Fire Department)

Co-investigator: Kevin E Mackey (South Sacramento), David Shatz (UC Davis), and others

Study Region: Sacramento County

Summary: Firefighters are exposed to toxic gasses including carbon monoxide (CO) during fire suppression activities. This prospective observational study measured pre- and post-exposure CO levels and found that the majority of exposures were associated with no changes in CO from baseline after fire suppression or overhaul.

Status: An abstract was presented at the National Association of EMS Physicians meeting in Tucson, AZ, January 2012. The manuscript is being written.

14. Chest pain STEWARD (STandardizing Emergency Work-up Around Risk Data) investigation

Principal Investigator: Dustin G Mark (Oakland/Richmond) and Mary E Reed (DOR)

Co-Investigators: KP CREST Network

Study Sites: Northern CA

Funding sources: TPMG’s Delivery Science program and the Lokahi Foundation
Summary: The prospective component is leveraging findings from the published retrospective study to provide point-of-care clinical decision support via the RISTRA platform to ED physicians, while dually serving as a prospective data collection tool to validate findings from the retrospective study.

Status: Our first manuscript was published in the *J Amer Coll Cardiol*: “Performance of coronary risk scores in patients with CP in the ED.” Implementation of our electronic clinical decision support tool began in December 2017 across 13 CREST EDs.

15. The management of stable monomorphic ventricular tachycardia in the community ED setting

Principal Investigator: **Ian McLachlan** (San Francisco)

Co-Investigators: James Lin and Taylor Liu (Santa Clara), Sean Bouvet (Walnut Creek/Antioch), David R Vinson (Sacramento/Roseville), Mary Reed (DOR), and the KP CREST Network

Study Sites: KP Northern California

Funding: KP Northern California Community Benefit Program

Summary: Monomorphic ventricular tachycardia (VT) is most often a precursor to life-threatening ventricular fibrillation and cardiac arrest. A small minority of patients with VT, however, present to the ED alert and oriented, with normal blood pressures. “Stable VT” may be amendable to pharmacological treatment, but because it’s uncommon, few studies have compared treatments. This retrospective cohort study will include ED patients who were treated for stable monomorphic VT in KP Northern California. We will describe patient selection, treatment variation, VT termination rates, and major side effects.

Status: Data collection is underway.

16. Recognition of outpatient pulmonary embolism (the ROPE study)

Principal Investigators: **Ian McLachlan** (San Francisco)

Co-Investigators: David R Vinson (Sacramento/Roseville), Dustin Ballard (San Rafael), Mary Reed (DOR), Corby Malik (UC Davis), Matt Stevenson (Santa Clara/Stanford), and the KP CREST Network

Study Sites: KP Northern California  
Funding: KPNC Community Benefit Programs

Summary: It is unknown what proportion of ED patients who receive an objectively-confirmed diagnosis of acute pulmonary embolism (PE) had seen an outpatient provider for explicit PE-related symptoms in the preceding weeks. This retrospective cohort study will answer the following questions: What patient characteristics facilitate early recognition of PE? Might delayed recognition occur because these patients have fewer risk factors to start with or more normal vital signs, making their PE harder to recognize? Does timing of recognition correlate with clinical outcomes?
Status: Data collection is underway. We are presenting an abstract at the American College of Emergency Physicians in October in San Diego.

17. Safety and effectiveness of thoracic vent placement for spontaneous pneumothorax in the ED

Principal Investigators: Seth Meyer and Jeff Lapoint (San Diego)

Study Sites: KP San Diego

Summary: For the past several years Kaiser San Diego has been treating spontaneous pneumothoraces with thoracic vent placement. This study will retrospectively examine the safety and effectiveness of this technique.

Status: Data collection is underway

18. Prevention and treatment of amatoxin-induced hepatic failure with IV milk thistle (Silibinin [Legalon® SIL]): an open multicenter clinical trial

Principal Investigator: Todd Mitchell (Dominican Santa Cruz Hospital)

KPNC Regional PI: Steve R Offerman (South Sacramento) Funding: Madaus Inc

Study Sites: Northern California and beyond

Summary: The industry-sponsored study includes patients two years and older with a history of eating foraged mushrooms and GI symptoms and LFTs abnormalities suggestive of amatoxin poisoning. Eligible patients receive intravenous Legalon SIL (Silibinin), 20 mg/kg/day. The primary outcome is prevention of liver transplantation and death. See https://clinicaltrials.gov/ct2/show/NCT00915681

Status: Enrollment is ongoing through the end of 2018.

19. Impact of residency training on quality of process improvement and QI projects

Principal Investigator: So Onishi (San Diego)

Co-Investigators: Matthew Silver (San Diego), Davida Becker (Pasadena)

Study Site: San Diego Funding: GME Research Mentorship Program

Summary: This is a survey study of resident QI projects. A modified SQUIRE evaluation tool will be introduced to residents early in residency. The study will compare pre- and post-implementation outcomes via survey to assess if early introduction of this evaluation tool improves the quality of resident QI projects.

Status: The manuscript is undergoing peer-review.

20. Derivation and testing of a search tool that combines ICD codes and unstructured clinical data to improve accurate case identification of ED patients with acute heart failure (AHF)
Principal Investigator: **Dana R Sax** (Oakland/Richmond)

Co-Investigators: Dustin Mark and Jamal Rana (Oakland/Richmond), Mary Reed (DOR), and the KP CREST Network

Study Sites: KP Northern California

Funding: KP Northern California Community Benefit Program

Summary: Heart failure affects 6 million Americans. Research on outcomes, resource utilization, risk stratification and management of AHF patients in the ED is limited both in volume and quality. In particular, accurate case identification has been challenging. We plan to develop a search tool to retrospectively identify patients with AHF in the ED based on structured (ICD codes, chief compliant, and laboratory tests) and unstructured (clinical detail within ED provider notes) data. We will develop (derivation cohort) and then test (validation cohort) the tool on a random sample of 400 KPNC ED patients during 2013-2014.

Status: Data collection is underway.

### 21. Accelerating Access through Call Centers (AACC) study

Principal Investigators: **Dana R Sax** (Oakland/Richmond)

Co-Investigators: Cyrus Yamin (OAK), Mary Reed (DOR), David R Vinson (Sacramento/Roseville), Dustin Mark (Oakland/Richmond), Troy Falck (AACC and Sacramento), Reena Bhargava (AACC and Santa Clara), Maria Glymour (UCSF), and the KP CREST Network

Study Sites: KP Northern California

Funding: KPNC Community Benefit Programs

Summary: Telephone call centers like Kaiser Permanente Northern California’s Appointment and Advice Call Center (AACC) provide medical advice and help direct patients to the appropriate venue of care. Patients who call in are routed from service representative to a nurse, and, if emergent, to a physician. In 2012, the AACC introduced a new routing for chest pain (CP) complaints. The “Call Center MD Up Front” program forwarded patients directly to physicians instead of nurses if CP was noted by the service representative. Was the introduction of a direct-to-physician protocol associated with a reduction in ED visits?

Status: The manuscript is undergoing revisions for *Health Affairs*.

### 22. Attitudes regarding the integration of screening and addressing social determinants of health as a part of routine health care

Principle Investigators: **Adam L Sharp** (DRE, Los Angeles), Adam Schickedanz (UCLA) and Artair Rogers (Health Leads)

Co-Investigators: Anna Jackson (CMI), Courtnee Hamity (CMI), Lunarosa Peralta (CMI)
Study Sites: Southern California

Funding: Care Improvement Research Team (CIRT)

Summary: Clinical screening for basic social needs – such as food and housing insecurity – is becoming more common as health systems develop programs to address social determinants of health. Clinician attitudes toward such programs are largely unexplored. We aim to describe the attitudes and experiences of social needs screening among patients and a variety of clinicians and other health care professionals. This study is a multi-center electronic and paper-based survey.

Status: Data collection is underway.

23. Identifying and addressing the social needs of high-utilizing patients

Principle Investigators: Adam L Sharp (DRE, Los Angeles), Adam Schickedanz (UCLA) and Artair Rogers (Health Leads)

Co-Investigators: Anna Jackson (CMI), Courtnee Hamity (CMI), Lunarosa Peralta (CMI)

Study Sites: Southern California

Funding: Care Improvement Research Team (CIRT)

Summary: An operational project began in 2014 in collaboration with Health Leads to design an intervention to identify and address the social, non-medical needs of KPSC members. A central community resource hub (CRH) was created to telephonically screen, then follow up with members with identified needs to assist in connecting to available community resources. The primary outcomes were ED, outpatient and inpatient utilization and a propensity weighted difference-in-differences evaluation strategy compared pilot sites to controls.

Status: Data collection is underway.

24. Comparative effectiveness of early diagnostic and disposition strategies for suspected acute coronary syndrome

Principal Investigators: Adam L Sharp (DRE, Los Angeles) and Ben Sun (OHSU)

Co-Investigators: Rita Redberg (UCSF), Michael Gould (DRE), Ernest Shen (DRE), Chengyi Zheng (DRE), Aniket Kawatkar (DRE)

Study Sites: KP Southern California

Funding: NHLBI

Summary: This is a comparative effectiveness study of five early diagnostic (stress ECG, stress echo, stress MP, CCTA or NO testing) and three disposition (inpatient, observation status, discharge) strategies for the ED evaluation of suspected acute coronary syndrome (ACS). We will study a prospective observational cohort of ~170,000 patients accrued over 5 years at EDs within
the KPSC health system. The ultimate goal of this proposal is to improve outcomes after an ED evaluation for suspected ACS.

Status: Data collection has begun.

25. National diagnostic performance dashboard to measure and track diagnostic error using big data

Principal Investigators: Adam L Sharp (DRE, Los Angeles°), David Newman-Toker (Johns-Hopkins), Ketan Mane (KPMA)

Co-Investigators: Najilla Nassery (Johns-Hopkins), Ejaz Shamim (KPMA), Michael Gould (DRE) and Ernest Shen (DRE)

Sites: KP Southern California, Johns Hopkins, KP Mid-Atlantic  Funding: Moore Foundation

Summary: Diagnostic errors may be the leading cause of preventable harm in U.S. healthcare, with estimates suggesting 12 million people a year are affected. New approaches to diagnostic performance measurement are vital to improve care moving forward. Evidence showing stroke misdiagnosed as benign dizziness in the ED is a target for improvement and this effort aims to operationalize a diagnostic performance dashboard for this condition. KPSC and KPMA will use similar methods to understand if myocardial infarction, pulmonary embolism, and sepsis offer similar opportunities to improve diagnostic performance.

Status: Pilot study manuscript is being prepared and data collection is underway.

26. Outcomes of patients with supraventricular tachycardia and elevated biomarkers

Principal Investigator: Clifford J Swap (San Diego)

Co-investigators: Andrew Williamson (San Diego)

Study Sites: Southern California

Summary: Many patients presenting to the ED with supraventricular tachycardia (SVT) and elevated troponin levels (after cardioversion) are admitted to the hospital. Our hypothesis is that these patients do not require admission and can be safely discharged with cardiology referral. We will undertake a retrospective chart review to investigate the outcomes of all ED patients with admit or discharge diagnosis of SVT and elevated troponin levels, to determine if these patients can be safely discharged.

Status: We presented an abstract at the Society of Academic Emergency Medicine annual meeting, Indianapolis, IN, May 2018. The ms is being written.

27. Clinical decision support for atrial fibrillation and flutter

° DRE = KPSC Department of Research & Evaluation (Pasadena);DOR = KPNC Division of Research (Oakland)
Principal Investigators: **David R Vinson** (Sacramento/Roseville) and Mary Reed (DOR)

Co-Investigators: Margaret Warton (DOR), Dustin Ballard (San Rafael), Dustin Mark (Oakland), Uli Chettipally (South San Francisco), Bory Kea (OHSU), Dale Cotton (South Sacramento), Malti Charlu (San Jose), Jodi Loyles (KP Regional), Alan Go (DOR), and the KP CREST Network

Funding: TPMG’s Deliver Science Program (via the Physician Researcher Program)

Study Sites: KP Northern California

Summary: Our preliminary descriptive and analytic work will evaluate drug selection for stroke prevention with the recent availability of direct oral anticoagulants like dabigatran. We also will design, build, and pilot a web-based computerized clinical decision support tool to aid in the comprehensive management of ED patients and inpatients with atrial fibrillation and flutter.

Status: We are presenting an abstract at the American College of Emergency Physicians in October in San Diego that describes how the introduction of dabigatran to the formulary increased overall initiation of oral anticoagulants at the time of ED discharge for stroke-prone patients with atrial fibrillation and flutter. We have also begun design of our clinical decision support tool.

### 28. Optimal anticoagulation strategies for patients with newly detected acute atrial fibrillation

Principal Investigators: Bory Kea (OHSU) and **David R Vinson** (Sacramento/Roseville)

Co-Investigators: Margaret Warton and Mary Reed (DOR), Ben Sun and Rochelle Fu (OHSU), Merritt Raitt (Portland VA Medical Center), and Greg YH Lip (University of Birmingham)

Study Sites: KP Northern California

Funding: NIH’s National Heart, Lung, and Blood Institute (NHLBI)

Summary: In this retrospective cohort study of patients with newly-detected AF/FL we will describe the incidence, time lag, and predictors of oral anticoagulation (OAC) prescribing after an ED discharge diagnosis of new AF/FL, determine whether validated outpatient risk stratification scores can identify a subgroup of ED patients discharged with new AF/FL who are at high risk for stroke and death, and compare the rates of these events for patients prescribed ED OACs vs patients not prescribed OACs at their index ED visit. These results will improve our understanding of ED OAC initiation and inform parallel research we are doing (above) on the development of clinical decision support tools and guidelines to aid in management of AF/FL patients in our EDs and inpatient settings.

Status: Data collection is underway

### 29. The management of atrial fibrillation and flutter in emergency medicine (the TAFFY Study)

Principal Investigator: **David R Vinson** (Sacramento/Roseville)
Co-investigators: The KP CREST Network, Jie Huang (DOR), Patricia Ramos (KP Portland), David Glaser (KP Denver), Bory Kea (OHSU)

Funding: Garfield Memorial National Research Fund

Study Sites: KP Northern California (7 EDs)

Summary: This prospective cohort study is profiling the characteristics of ED patients with non-valvular AF in community settings, describing the variation in management across EDs, and correlating patient and management variables with utilization, procedures, and complications.

Status: A manuscript on quality of life outcomes was published in Ann Emerg Med. A manuscript on the anticoagulation of ED patients with AF at high risk was published in West J Emerg Med. Our third manuscript is being written, this on facility-level variation in hospitalization. The next study will describe the management of recent-onset AF.

30. Ibutilide, amiodarone and procainamide for the cardioversion of atrial fibrillation/flutter: the PharmCAFÉ Study

Principal investigator: David R Vinson (Sacramento/Roseville)

Co-investigator: Dustin Ballard (San Rafael), Aaron Rome (South Sacramento), Garrett Thiel, Oliver Dutczak and Nelya Lugovskaya (UC Davis), Matt Stevenson (KP Santa Clara/Stanford), Margaret Warton and Manvi Nagam (DOR) and the KP CREST Network

Summary: We are comparing effectiveness and adverse event rates of these three drugs at four hours. This comparative effectiveness study will yield important information to help guide emergency providers in the selection of pharmacological agents for the cardioversion of AF/F.

Status: We have presented four abstracts. The ibutilide study has been published and the procan paper is being written. Data collection on the amio cases will continue through 2018.

31. Management of Acute Pulmonary Embolism (the MAPLE study)

Principal Investigator: David R Vinson (Sacramento/Roseville)

Co-investigators: The KP CREST Network, Matt Silver, Cliff Swap, and Billy Krauss (San Diego), David Wang (UCSF), Tamara Pleshakov (Los Angeles), Cyrus Yamin (DOR), Andy Klonecke (Sacramento), Victoria Clague (San Rafael)

Study Sites: Northern California

Funding: Garfield Memorial National Research Fund, KPNC Community Benefit Program, and the TPMG Delivery Science and Physician Researcher Programs.
Summary: This retrospective cohort study will describe the population of patients with acute PE across several regions from Jan 2013 through April 2015. We will analyze physician practice patterns and patient outcomes.

Status: We have published three papers on: (1) post-ED follow-up, (2) the performance of the PE Severity Index, and (3) the safety of home management. We recently presented four abstracts at the annual meeting of the Society of Academic Emergency Medicine, May 2018. We hope to transpose these into full manuscripts in 2019.

### 32. Impact of electronic clinical decision support on site-of-care for ED patients with acute pulmonary embolism (PE)

Principal Investigator: **David R Vinson** (Sacramento/Roseville)

Co-investigators: The KP CREST Network

Study Sites: Northern CA Funding: Garfield Memorial National Research Fund and KPNC Community Benefit Programs

Summary: We designed a web-based electronic clinical decision support system (CDSS) to bring a validated risk stratification tool to the physician at the point of care. This study will assess its impact of the rate of pts discharged home from the ED along with the effect on patient satisfaction.

Status: We presented an abstract at the American College of Emergency Physicians Research Forum in Las Vegas in October 2016. The ms is in press with *Ann Intern Med*.

### 33. Describing patient satisfaction, site-of-care preferences, and health-related quality-of-life among ED patients with low-risk PE

Principal Investigator: **David R Vinson** (Sacramento/Roseville)

Co-investigators: Laura E Simon (DOR) and the KP CREST Network

Study Sites: Northern California Funding: Garfield Memorial National Research Fund and KPNC Community Benefit Programs

Summary: This telephone interview study will describe patient satisfaction, site-of-care preferences, and health-related quality-of-life among patients with low-risk PE managed in KPNC EDs in 2014-2015.

Status: We presented an abstract at the annual meeting of the Society of Academic Emergency Medicine, May 2018. The manuscript is in press with *West J Emerg Med*.

### 34. Identifying ED patients with mild traumatic intracranial hemorrhage at low risk for acute critical care intervention
Principal Investigator: **David R. Vinson** (Sacramento/Roseville)

Co-investigators: Kanwal Gill and Manny Garrido (Roseville/Sacramento), James Lin (Santa Clara), Dustin Mark (Oakland), Alex Buss (Walnut Creek/Antioch), Travis Anderson (UC Davis), Brock Daniels (New York Presbyterian), Vignesh Arasu (Vallejo), Cody McHargue (UCSF), Margaret Warton (DOR), and the KP CREST Network

Study Sites: Northern California  
Funding: KPNC Community Benefit Programs

Summary: This multicenter retrospective cohort study seeks to answer two questions: what is the classification performance of the UC Davis clinical prediction instrument in identifying Kaiser patients with mild traumatic intracranial hemorrhage who do not require critical care interventions within 48h? What patient-level and facility-level characteristics are associated with non-ICU care?

Status: Data collection will soon be complete. We presented an abstract on the validation of the UC Davis rules at the 2017 meeting of the Society of Academic Emergency Medicine presented another on the derivation of a community-specific rule at ACEP, October 2017. The first manuscript is being written.

35. Ischemic stroke after traumatic injury in children and young adults

Principal Investigator: Christine Fox (UCSF)

Co-investigators: Heather Fullerton (UCSF), Steve Sidney (DOR), **David R Vinson** (Sacramento/Roseville), and others

Study Sites: Northern California  
Funding: NIH and the American Heart Association

Summary: We identified KPNC trauma patients (<50 years old), 1997-2011. Within this cohort, we identified and confirmed cases of arterial ischemic stroke within four weeks of trauma and three controls per case. We calculated the 4-week stroke incidence, abstracted clinical data and estimated stroke odds ratios [OR] using logistic regression.

Status: We published our first study in Neurology and are writing a second manuscript on stroke predictors.

36. Comparative analysis of drug adverse events between warfarin and dabigatran in the treatment of venous thromboembolism

Principal Investigator: **Michael Young** (San Diego)

Study Sites: KP Southern California  
Funding: Regional Research Committee

Summary: This retrospective cohort study will compare outcomes of patients being treated for DVT with warfarin vs dabigatran. Primary objectives include number of intracranial and GI bleeding events and other major bleeding events as well as number of recurrent venous
thromboembolic events. Secondary objectives will look at number of hospitalizations from non-bleeding drug adverse reactions.

Status: Data collection is underway.

Other 2018 Publications

TPMG (Northern CA)


Full-text: [https://journals.lww.com/em-news/fulltext/2018/04000/Medically_Clear__TXA_Superior_to_Packing_for.2.aspx](https://journals.lww.com/em-news/fulltext/2018/04000/Medically_Clear__TXA_Superior_to_Packing_for.2.aspx)


Full-text: [https://escholarship.org/uc/item/1bz425qs](https://escholarship.org/uc/item/1bz425qs)


Abstract: [http://pediatrics.aappublications.org/content/early/2018/03/09/peds.2017-2699](http://pediatrics.aappublications.org/content/early/2018/03/09/peds.2017-2699)

In the press:
- Calculator to predict pediatric appendicitis may improve patient care [https://upi.com/6722135](https://upi.com/6722135)

Simon LE, Rauchwerger AS, **Chettipally UK**, Vinson DR, Warton EM, Kharbanda AB, Kharbanda EO, **Ballard DW**. Real-time text message alerts to emergency physicians identifying potential study candidates increases clinical trial enrollment. *J Patient Cent Res Rev.* 2018;5(S1):57 [abstract OA1.03].

Full-text: [https://docs.wixstatic.com/ugd/0e64cd_cdfeb32048ba4c2a80ab1c462a229e5a.pdf](https://docs.wixstatic.com/ugd/0e64cd_cdfeb32048ba4c2a80ab1c462a229e5a.pdf)


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Since Jan 2018. A more comprehensive list of publications from the KP CREST Network can be found online: [http://www.kpcrest.net/](http://www.kpcrest.net/)


In the press:


Full-text (free): [https://escholarship.org/uc/item/7hn511dt](https://escholarship.org/uc/item/7hn511dt)

Editorial: [https://escholarship.org/uc/item/76j267ts](https://escholarship.org/uc/item/76j267ts)


Full-text (free): [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5717383/](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5717383/)


**SCPMG (Southern CA)**


Full-text: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5851523](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5851523)


Full-text: https://doi.org/10.21980/J8R03J


Sharp A, Fendrick AM. Delivery of acute unscheduled healthcare: who should judge whether a visit is appropriate (or not)? Am J Manag Care. 2018;24(5):294-295.


Link: https://catalyst.nejm.org/ed-acute-coronary-syndrome-heart-score/


Abstract: http://qualitysafety.bmj.com/content/early/2018/03/17/bmjqs-2018-007945.long


Sharp AL. The essential facts of life are the foundation of health [editorial]. Am J Manag Care. 2018 Feb 19 [Epub].
