

The Colorado Opioid Safety Collaborative

The Colorado Hospital Association, Colorado Chapter of American College of Emergency Physicians, Colorado Consortium for Prescription Drug Abuse Prevention, Telligon and the Colorado Emergency Nurses Association



2017

Colorado Opioid Safety Pilot Results Report



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Colorado Hospital Association

Background

Pain is one of the most common reasons for admission into the emergency department (ED) in the United States. Traditionally, opioids have been used as the primary way to treat acute pain in the ED. Opioids are not only ineffective for some patients, but have a high incidence of side effects and adverse reactions. Most concerning, opioids administered by well-meaning clinicians can also contribute to abuse and misuse and can serve as a gateway drug to illicit drugs, such as heroin.

Overdose is the number one killer of Americans under the age of 50, and Colorado is significantly affected by the opioid epidemic. According to data from the Colorado Department of Health Care Policy and Financing, in 2015, approximately one Coloradan died every 36 hours from opioid overdose. Additionally, risk from illicit drugs has increased, and in 2016, heroin overdose deaths increased by 23 percent from 2010. Neonatal abstinence syndrome has risen 91 percent among Colorado Medicaid members.

Colorado hospital leaders recognize this as a high priority for their patients and the communities they serve. As such, Colorado hospitals are in a strong position to reduce opioid use, specifically as their EDs serve a population vulnerable to and at risk for opioid misuse and abuse.

In January 2016, the Colorado Hospital Association (CHA) launched the CHA Colorado Opioid Safety Survey to better understand the state of the current opioid work being done by member hospitals and health systems across Colorado. Nearly 80 percent of all survey respondents indicated they were actively working on opioid safety. The ED was identified as the number one area in which opioid safety was a concern, and more than 90 percent of participants wanted more information on how CHA could assist with opioid safety. Following the survey, CHA created an Opioid Safety Steering Committee, with the goal of identifying how CHA could bring value to its hospital partners and work toward combating the ever-growing Colorado opioid epidemic.

Armed with the survey results, CHA developed key strategic partnerships with the Colorado Chapter of the American College of Emergency Physicians (Colorado ACEP), the Colorado Consortium for Prescription Drug Abuse Prevention, Telligen and the Colorado Emergency Nurses Association (Colorado ENA). Together the organizations formed the Colorado Opioid Safety Collaborative to improve opioid safety in Colorado EDs.

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Colorado ACEP Guidelines

In June 2017, Colorado ACEP published the Colorado ACEP: *2017 Opioid Prescribing & Treatment Guidelines*, an evidence-based guide to inform how EDs can holistically address the opioid epidemic. The guidelines are among the most comprehensive opioid guidelines published to date, with recommendations developed by a panel of more than 20 experts and volunteers, including emergency physicians, addiction and harm reduction specialists, pharmacists, paramedics, emergency department nurses and medical students.

The guidelines highlighted four pillars to address the opioid epidemic through the ED:

1. Limiting opioid use in the ED
2. Using alternative to opioids (ALTOs) for the treatment of pain
3. Harm reduction in the ED
4. Treatment of opioid addiction

Of the four pillars, the Colorado ACEP opioid guidelines are some of the first professional medical guidelines to call for broad adoption of ALTOs for treatment of pain and harm reduction principles for patients who use IV drugs. The guidelines are available for further review, in their entirety, at: http://coacep.org/docs/COACEP_Opioid_Guidelines-Final.pdf.

After reviewing the available information, the Association decided to focus on the second pillar of the guidelines for its pilot program. The implementation of ALTO protocols would require significant coordination across ED providers, pharmacy, clinical staff and administrators. The ALTO section of the guidelines championed a multimodal approach to pain, introduced new medications and procedures available to clinicians to treat pain and provided detailed guidance for use of ALTOs for treatment of common pain conditions. With this approach, the guidance provides tools for improved pain treatment and, in contrast to other existing guidance, is not strictly focused on opioid restriction.

Five pain pathways were specifically described in the ALTO section (see additional details in **Appendix**):

1. Headache and/or migraine
2. Musculoskeletal pain
3. Kidney stones
4. Chronic abdominal pain
5. Extremity fracture and joint dislocation

By using a multimodal treatment approach to pain management, it was anticipated the initiative would result in improved control of pain in patients treated in the ED, as well as a decrease in opioid use.

Objectives

The Colorado Opioid Safety Collaborative's primary objective was to implement Colorado ACEP's *2017 Opioid Prescribing & Treatment Guidelines* in select EDs across Colorado. The pilot focused specifically on implementation of the ALTO approach detailed in the Colorado ACEP Guidelines. The collaborative anticipated that changing pain management strategies would result in the reduction of opioid use and an increase of ALTO use, without a reduction in patient satisfaction scores.

The Colorado Opioid Safety Collaborative established the following specific goal and aim:

Goal:

Reduce administration of opioid medications by ED clinicians through implementation of the ALTO approach from the *Colorado ACEP 2017 Opioid Prescribing & Treatment Guidelines*.

Aim:

Reduce administration of opioids by 15 percent, measured in morphine equivalent units (MEUs), over the 2017 six-month pilot, as compared with the same six-month baseline period in 2016.

Project Design

The primary architects of the project were guideline developers Don Stader, MD, and Rachael Duncan, PharmD; in partnership with CHA Clinical Quality Improvement Manager, Diane Rossi MacKay, RN, MSN, CPHQ; CHA Physician Advisor, Heidi Wald, MD, MSPH; CHA Clinical Quality Improvement Manager, Elizabeth Adle, MAT, BSN, RN, NE-BC; and CHA Project Manager, Ashley Baker, MPA; along with former CHA Project Manager Sarah Hodgson.

They assembled a steering committee of key stakeholders and subject matter experts from CHA member hospitals, including ED providers, nurses and pharmacists; as well as representatives from Colorado ACEP, the Colorado Consortium for Prescription Drug Abuse Prevention, Colorado ENA and Telligen.

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Planning Phase (January 2016 – May 2017)

During the planning phase, CHA launched the Colorado Hospital Opioid Safety Survey, convened a steering committee, formed the Colorado Opioid Safety Collaborative, defined goals, piloted use of a new data software program and developed a data collection strategy to ensure uniform and accurate data presentation. CHA approached its membership and, in concert with Colorado ACEP, recruited 10 ED pilot sites. These EDs received pilot launch materials and in-person, multidisciplinary (physician, nurse and pharmacist) training. In addition, Colorado Opioid Safety Pilot web-based training modules were developed for use throughout the pilot to reinforce concepts and principles taught during onsite trainings.

The steering committee selected outcome measures relevant to the Colorado ACEP guidelines and developed goals and an aim statement. ED partners using a variety of electronic medical record systems were oriented to the data elements and formats and provided baseline data measures.

Recruitment

Pilot ED recruitment was carried out through outreach to hospitals based on region, urban/rural status, regional opioid use/misuse and/or a member hospital representative on the steering committee. Participating sites were required to have a signed commitment from the hospital’s executive leadership team.

To recruit pilot sites, CHA contacted key stakeholders – ED medical directors and a member of the executive leadership team – at each acute care facility. While the initial goal was to recruit four EDs for the pilot, the response and interest exceeded expectations. The CHA Opioid Steering Committee determined that to maintain the integrity of the pilot, only 10 EDs would be selected.

Participants

Participation in the pilot was voluntary and required motivated emergency physician and nurse champions along with a committed CEO. No external financial support was provided to EDs. Participating EDs are shown in **Table 1**.

Table 1: Participating Facilities

Hospital Name	Hospital Beds	Rural/ Urban	Hospital Type	# of ED Visits (2016 Data)	Trauma Designation
Boulder Community Health	178	Urban	Acute Care	37,284	Level II
Gunnison Valley Health	24	Rural	Critical Access	6,743	Level IV
Sedgwick County Health Center	15	Rural	Critical Access	1,167	Level IV
Sky Ridge Medical Center	284	Urban	Acute Care	34,650	Level II
Swedish Medical Center	408	Urban	Acute Care	59,753	Level I
UCHealth Greeley Emergency and Surgical Center	N/A	Urban	Freestanding ED	24,598	None
UCHealth Harmony Campus	N/A	Urban	Freestanding ED	11,366	None
UCHealth Medical Center of the Rockies	174	Urban	Acute Care	30,905	Level II
UCHealth Poudre Valley Hospital	231	Urban	Acute Care	52,339	Level III
UCHealth Yampa Valley Medical Center	39	Rural	Acute Care	4,164	Level IV

N/A=not applicable

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Pilot Phase: (June 2017 – November 2017)

The CHA Opioid Safety Steering Collaborative led an implementation of the Colorado ACEP ALTO guidance. To facilitate effective dissemination of the guidelines and to promote consistency among the 10 pilot EDs, CHA offered a variety of resources throughout the pilot:

Educational offerings

- In-person training
- Training materials
- Webinars

Technical support

- *Colorado ACEP 2017 Opioid Prescribing & Treatment Guidelines*
- Quality Improvement (QI) support, using the Institute for Healthcare Improvement's Model for Improvement – Plan, Do, Study, Act (PDSA)
- Coaching calls
- Peer mentorship
- Pilot participant email group
- Team recruitment tools and advice
- QI specific tools and resources

Data reports

- Data collection support
- Data reports
- Data specific webinars

Marketing and communications

- Opioid pilot specific marketing toolkit
- Marketing/communications webinars
- Coordination with local and national media
- Sample opioid safety communication tools

Wrap Up (November 2017 – January 2018)

At the end of the pilot, EDs submitted their final data. Overall pilot results were released at the Colorado Opioid Safety Summit in January 2018 where national and local speakers discussed pilot results, opioid pilot next steps, new statewide opioid grant opportunities and the preparation of the opioid safety pilot academic publication. Pilot EDs were challenged to review their data for additional improvement opportunities and to develop a sustainability plan.

Data Collection

The Steering Committee specified data elements needed to demonstrate impact on opioid prescribing, ALTO prescribing and patient satisfaction. Data sources included ED admission/discharge/transfer data, pharmacy administration data and patient experience survey data. Informatics personnel participated in data calls to ensure data collection was facilitated by monthly electronic reporting securely transmitted to CHA.

The CHA data analyst then cleaned all data fields, standardized formatting, units and medication names and linked the datasets to ED administration claims. After linking, the analyst removed direct identifying fields and aggregated the data by month and facility. Processed, aggregated and deidentified data were then uploaded into Power BI so participating facilities could log in to look at their own and the cohort's aggregated data by month, medication, diagnosis and patient demographics.

Sites were asked to provide retrospective data for all ED cases during the six-month baseline period between June 1, 2016 and Nov. 30, 2016 and the six-month intervention period between June 1, 2017 and Nov. 30, 2017.

Measures

For the purpose of this pilot, opioids consisted of the following medications: methadone, hydromorphone, meperidine, oxycodone, hydrocodone, codeine, buprenorphine, morphine, fentanyl, fentanyl nasal spray and tramadol. All opioids were converted to morphine equivalent units using a conversion table.

ALTOs included the following medications: acetaminophen, ibuprofen, lidocaine, haloperidol, ketamine, ketorolac and dicyclomine. This list is not inclusive of all ALTOs.

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a patient satisfaction survey required by the Centers for Medicare and Medicaid Services (CMS) for all acute care hospitals in the United States. For the pilot, CHA requested the answers to two ED questions supplied by adult patients seen in participating EDs during the baseline and intervention periods.

1. How well was pain controlled? Selections: Never, Sometimes, Usually, Always
2. Likelihood of recommending this ED? Selections: No, Probably No, Probably Yes, Definitely Yes

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Analysis

CHA followed a multistep analytical process. Data sets were validated, and opioid doses were converted to MEUs. Mean change from baseline was calculated for opioid MEUs for each ED and each month and for the entire cohort each month. Run charts were analyzed to look at MEUs over time. Changes were also recorded in administrations by month so that opioid use could be compared to ALTO use, which is not convertible to a MEU. The changes in administration by medication between the baseline and intervention period were calculated, as was the change in administration between baseline and intervention periods for several diagnostic groups including headache, low back pain/lumbago, kidney stones, long bone fractures, abdominal pain and malignant neoplasm.

This composite data analysis was reviewed as an expedited human subjects research protocol by the Colorado Multiple Institutional Review Board.

Results

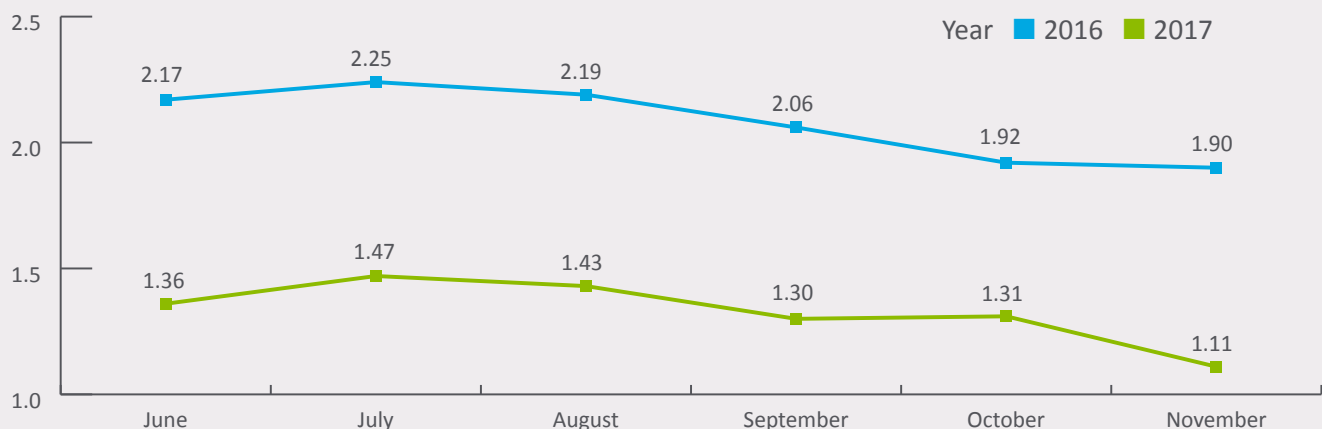
All 10 EDs successfully completed the opioid reduction pilot. Over the course of the six-month intervention period, the 10 EDs saw a total of 130,631 unique patient visits. This volume was comparable to the same time in the prior year (n=131,765).

In aggregate, the EDs decreased opioid usage (MEUs per 1,000 ED visits) by 36 percent between 2017 and the comparable six-month period in 2016, far exceeding the project goal of 15 percent. This amounted to 35,000 fewer opioid administrations during the 2017 pilot versus the 2016 baseline period, adjusted for number of visits.

(Figure 1)

Figure 1: Cohort Opioid Usage Baseline (2016) vs. Intervention (2017)

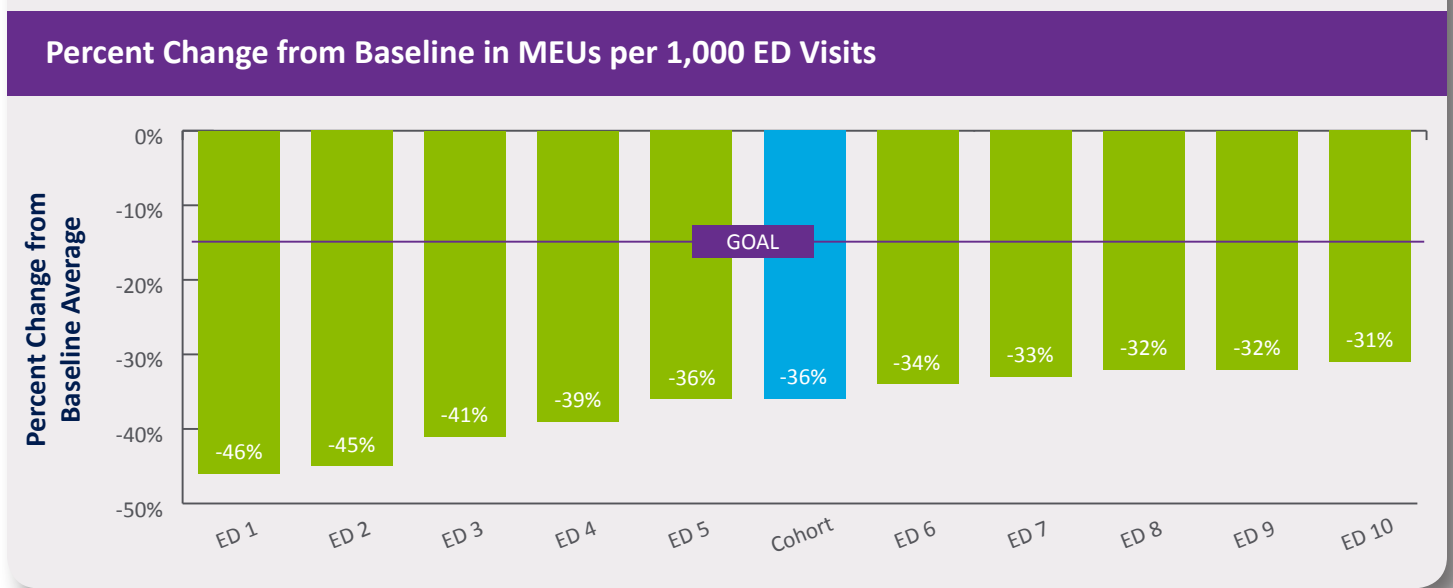
Average Morphine Equivalent Units per ED Visit



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Of note, large reductions in opioid use were seen at each participating site, ranging from 31 percent to 46 percent. **(Figure 2)**

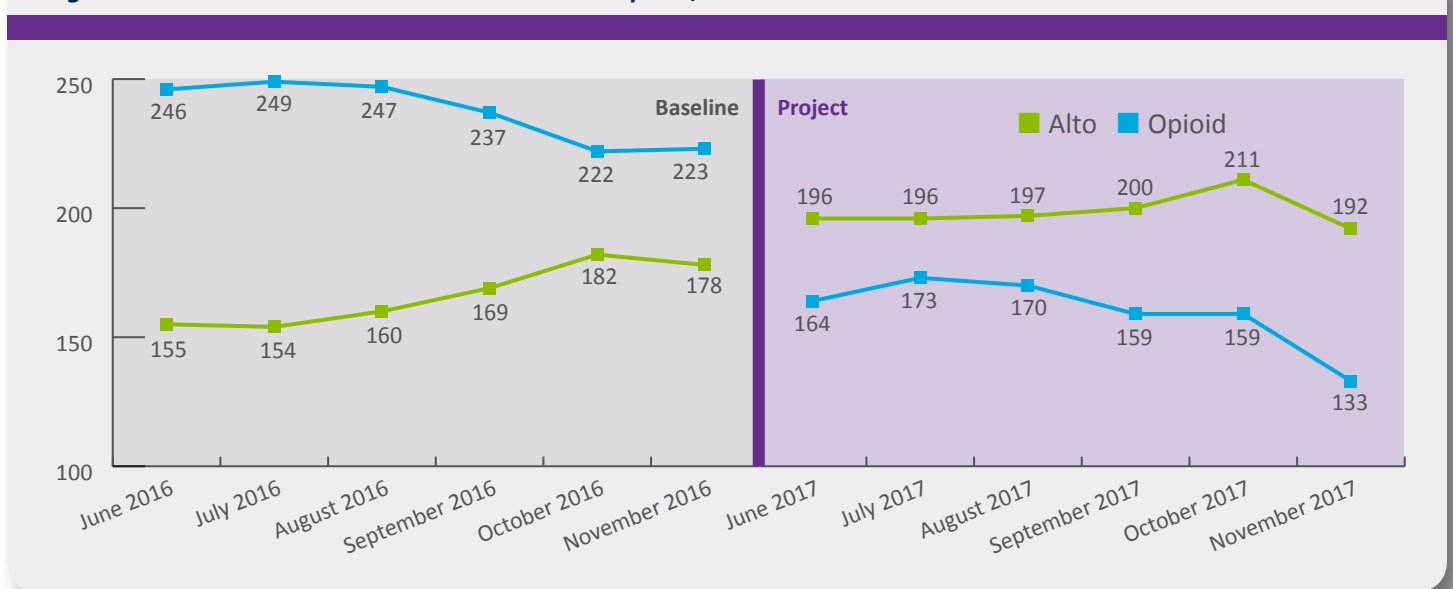
Figure 2: ED-Specific Percent Change in Opioid MEU (2016 vs 2017)



The *Colorado ACEP 2017 Opioid Prescribing & Treatment Guidelines* call for ALTOs to be used as first line for nearly all painful conditions and for opioids to be used as second line or rescue drugs for pain management. During the pilot period, the decrease in opioid administration was accompanied by a large increase in the use of ALTO medications. After implementation of the Colorado ACEP protocols, ALTO use became more common for treated pain visits than opioid use within the first month of the pilot. **(Figure 3)**

The vertical purple line represents the timing of the intervention. Note there is a gap of six months between the baseline and intervention periods.

Figure 3: Total Pain Medication Administrations per 1,000 ED Visits

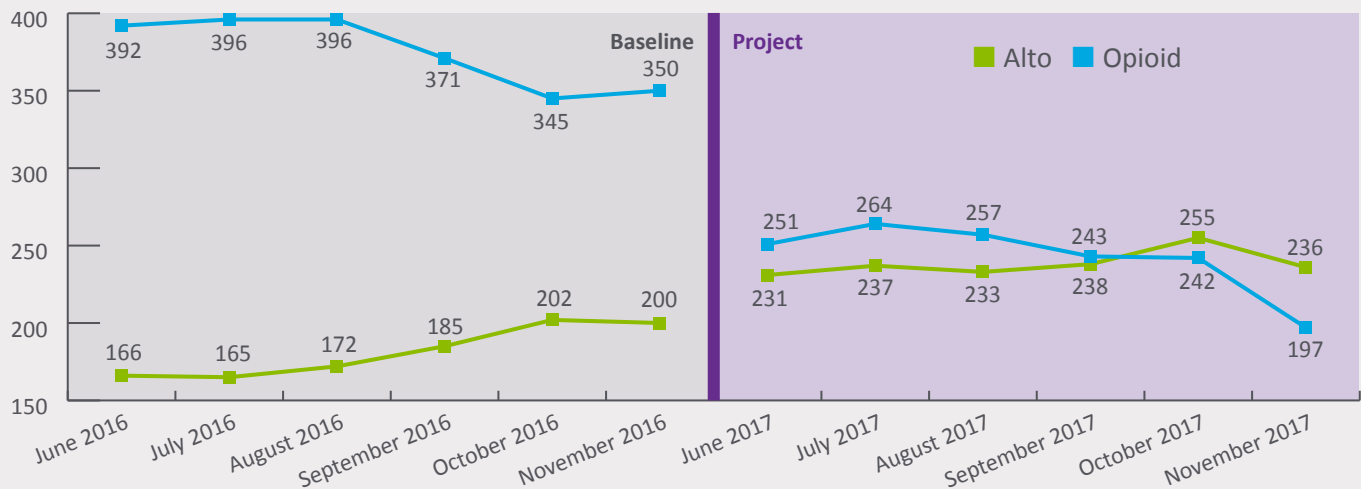


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Because analgesic medications are often administered multiple times to the same patient, the pilot also reported total medication administrations. In October 2017, administration of ALTO medications exceeded opioid usage in number of administrations across the pilot EDs. **(Figure 4)**

The vertical purple line represents the timing of the intervention. Note there is a gap of six months between the baseline and intervention periods.

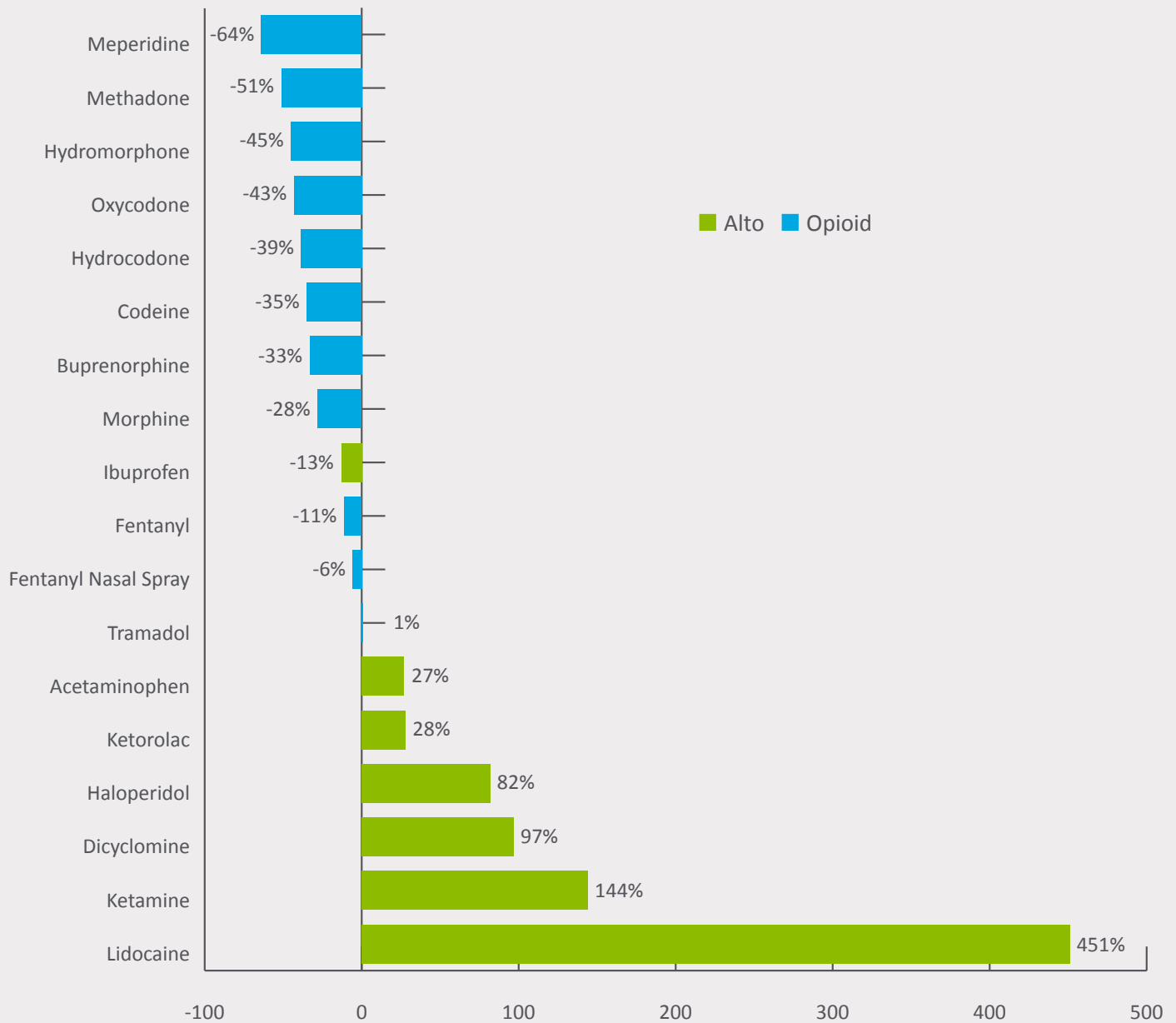
Figure 4: Number of Treated Pain Visits per 1,000 ED Visits



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Positive changes in prescribing were seen across nearly every medication tracked. Pilot EDs reduced administrations of each opioid medication, except for tramadol, which was unchanged. In contrast, pilot EDs increased administration of each measured ALTO medication, except for ibuprofen, which decreased. Increases were particularly dramatic in the administration of IV lidocaine and ketamine, which prior to the pilot study, were not used by many emergency clinicians or pilot EDs for the treatment of pain. Trigger point injection changes could not be extracted from the medication administration data at the time of publication.

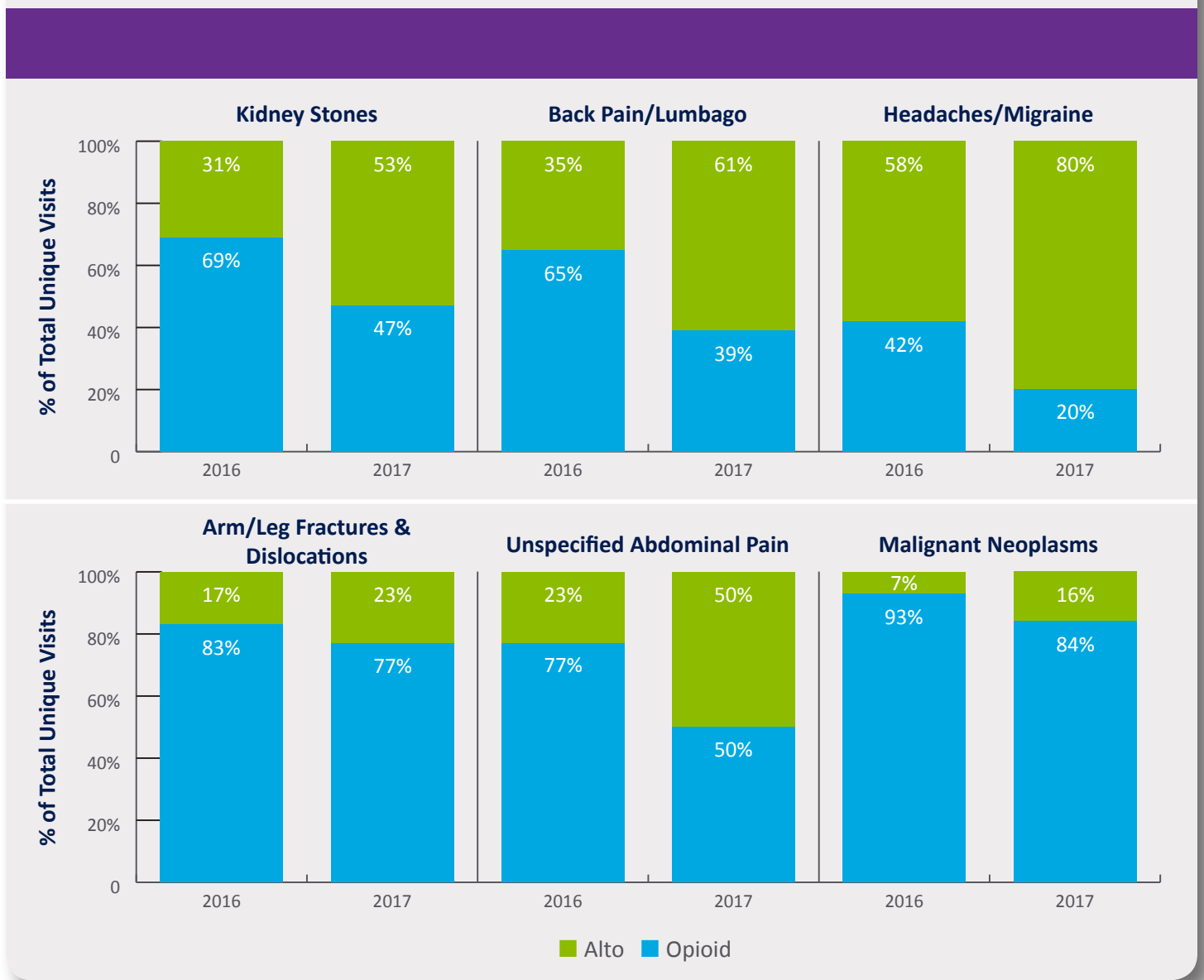
Figure 5: Percent Change in Administrations per 1,000 ED Visits from Baseline by Medication



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Regarding conditions-specific pathways described in the Colorado ACEP 2017 *Opioid Prescribing & Treatment Guidelines*, there was significant progress in emergency clinician adoption of this guidance over the course of the pilot. In 2016, opioids were the predominant medication used to treat low back pain/lumbago, kidney stones and unspecified abdominal pain; during the pilot, ALTOs surpassed opioids in treating these painful conditions. In the case of headaches/migraine where ALTOs were utilized more than opioids prior to the pilot, there was still a large decrease in opioid usage. Finally, for severe pain such as extremity fractures and pain associated with malignant neoplasms, opioids remained the preferred analgesic agent, but ALTOs were used more frequently than in 2016, and opioid administration still decreased significantly.

Figure 6: Analgesic Treatment (ALTO vs. Opioid Percent of Total Unique Visits) by Medical Condition



At the time of publication, the pilot does not yet have a full HCAHPS data set for analysis.

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Discussion

Each of the 10 pilot EDs saw significant changes in clinical practice and robust adoption of the Colorado ACEP 2017 *Opioid Prescribing & Treatment Guidelines*. The pilot EDs, as a cohort, achieved more than twice the stated goal of opioid reduction and dramatically increased ALTO usage to the point where ALTOs were used more than opioids for the treatment of pain. The reduction of opioids was remarkably consistent and across all pilot EDs. In eight of 10 sites, opioid use (measured by morphine equivalents per patient visit) was lower in 2017 than 2016 for each month of the pilot. For the remaining two locations, opioid use was lower in 2017 than 2016 for all but one month of the pilot.

The pilot was conducted in EDs in multiple hospital systems and varied patient volumes and practice environments ranging from rural to urban, mountain to plains and Level I trauma center to critical access hospitals. In each of these environments, there was tremendous success in implementing the treatment guidelines, significantly decreasing opioid usage and increasing ALTO usage.

The results must be interpreted in the context of a changing landscape of clinician and patient opinions about opioids and pain treatment in the wake of the opioid crisis. The baseline data suggests that opioid use by clinicians was already decreasing. As there are no control hospitals included, CHA cannot account for how much opioid and ALTO usage would have changed without intervention. Nonetheless, the magnitude and uniformity across medications, diagnoses and EDs suggest a marked effect of the intervention and pilot. Further, the HCAHPS dataset is not yet complete, so this pilot is unable to reference patient satisfaction at this time. Additionally, there are other potential balancing measures such as ED length of stay that were not measured in this pilot and are potential targets for future study.

Overall, these results indicate that an ALTO approach can be successfully implemented in diverse EDs, with large impact on the management of painful conditions. This approach holds great promise for dissemination across Colorado and nationally as a way to address the opioid epidemic through ED practice.

Lessons Learned

Both opportunities and challenges surfaced during the six-month pilot that offer important insights for moving ahead with phase two of the Colorado Opioid Safety Pilot and for others looking to implement phase one.

Prelaunch

While the overall concept of opioid safety has strong support in hospitals, CHA learned that the signed commitment letter by the CMO, CNO, CEO and ED physician and nurse champion was one key to success. Hospitals were not accepted to the pilot until the commitment letter was signed and returned to the Association. During a mid-pilot survey, the commitment letter was cited as one of the most important process steps leading to success.

Clear identification of roles and responsibilities prior to launch was also a critical success factor. Pilots used a pre-launch, time-sensitive checklist that identified who was responsible for specific tasks. Pilot EDs have assisted with the design of a more robust checklist that provides more detail and can be used as a readiness assessment for EDs looking to launch a similar ALTO initiative.

Data

Accurate data extraction is key to process improvement and pilot evaluation. However, many EDs struggled in the beginning of the pilot to dedicate the necessary resources to build quality improvement processes, to extract clean data with correct data elements and to submit pilot data on time. Some EDs did not identify a data champion until several weeks into the pilot. Once data were submitted, there were challenges with the data integrity.

CHA identified four opportunities to increase the chances that data are on-time, high-quality and will not require rework:

1. Before implementation, identify a technical IT champion to build EMR reports with correct data fields.
2. Provide the appropriate support to extract data reports for submission.
3. Ensure there is clinical review of all reports for data quality prior to submission.
4. Beta test all reports at least one month prior to launch.

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Clinical

Several opportunities were identified for the clinical roll out of the pilot.

1. Hands-on training was key, and the open networking forum using a clinician email group allowed for continued conversation and shared learnings throughout the six months.
2. Webinars, podcasts, individual coaching calls and materials like “badge buddies,” locker room posters and newsletter inserts were used to supplement and reinforce the ALTO methodology and assisted with continual learning.
3. Nurses were trained on patient/family ALTO pain communication using the AIDET model.
4. Clinicians asked for more training midway through the pilot to continue to reinforce newly learned concepts.
5. Site visits with an experienced ALTO clinician could provide beneficial mentorship.

In addition, many hospitals onboarded new clinicians, including physicians, advanced service providers and nurses during the pilot. Hospitals should strongly consider adding orientation or education for how to use ALTOs and decrease opioid usage to ensure similar practice patterns for pain control.

Communication

The role of frequent communication is critical to internal and external stakeholders. It was crucially important to provide each of the pilot sites with a communication and marketing toolkit, which included templated materials for a communication plan and verbiage for internal clinical, non-clinical and community strategies to discuss the change in pain management.

Another lesson learned about communication is the importance of beginning an internal communication plan prior to the launch. An improvement for future roll-out will be the development of a “top ten most commonly asked questions” one-page brief on the new ALTO approach to pain management.

Methodology

To change long-standing clinician prescribing behaviors and embed those changes in workflow, it is helpful to have team members with expertise in QI methods. Further, there should be equal education spent on subject matter and QI methodologies. Finally, methods of sustaining gains should focus on strategies to avoid returning to old pain management practices.

Next Steps

Despite the success of this pilot, CHA acknowledges the completion of the pilot is only the beginning of the next phase of work. First, the Association will conduct further in-depth analysis of the opioid safety pilot dataset, with the goal of learning more about care for specific patient populations and preparing a peer reviewed manuscript for publication in a major academic journal.

Once the data are available, CHA will also analyze HCAHPS scores to determine the impact that decreasing opioid usage and increasing ALTO usage had on patient satisfaction. The Association recognized that there are several additional ways to link that data to the original data.

The Association will also assist each pilot site in creating a plan to sustain the practice improvements, such as onboarding modules for new staff and support of ongoing data collection.

Since the launch of the Colorado Opioid Safety Pilot, there have been numerous requests from within Colorado and as well as other states to share this work. At the time of this publication, the CHA Opioid Safety Collaborative has presented, trained and/or prepared for ALTO launch for a minimum of four additional EDs and/or hospital associations in other states. The collaborative plans to disseminate the ALTO protocols to EDs throughout Colorado. To do so, CHA will ask each facility to complete a checklist assessing readiness for change and will use the information to plan up to four regional trainings in 2018. Hospitals completing the training will be provided a toolkit of materials, one-on-one consultation and data support. CHA is also exploring options for dissemination outside of Colorado through a national partnership.

This pilot project was the first step in CHA and the Colorado ACEP’s support of opioid safety initiatives in Colorado. The collaborative will continue to work to identify and support implementation of additional approaches to pain management and opioid prescribing across the hospital environment.

Approaching the opioid epidemic from a different angle, CHA has partnered with the Colorado Department of Human Services Office of Behavioral Health (OBH) to support a Medication-Assisted Treatment pilot in up to three Colorado EDs. The Association looks forward to supporting this effort and to help Colorado’s hospitals to turn the tide of the opioid epidemic.

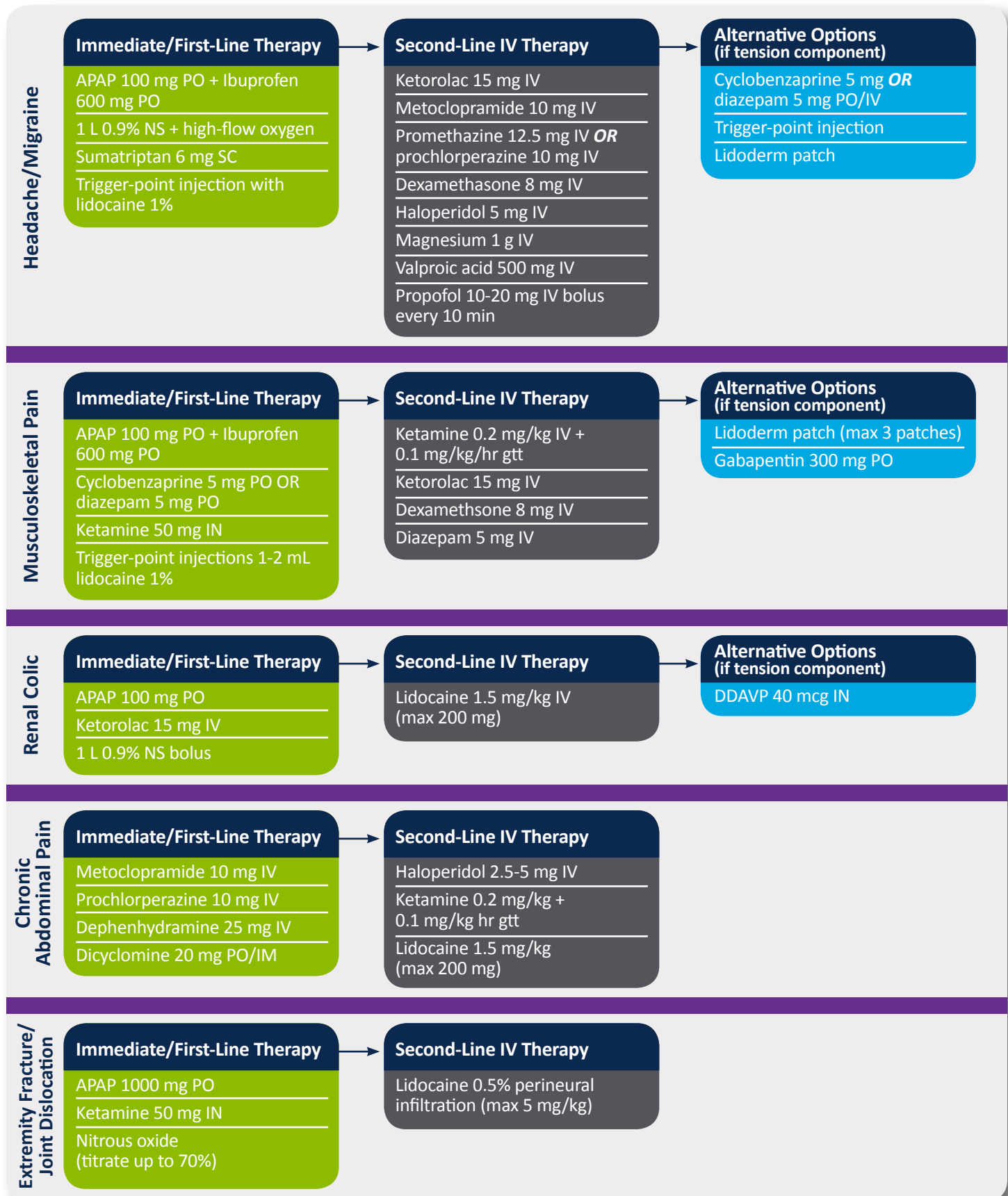
Conclusion

The Colorado Opioid Safety Pilot was successful at demonstrating the feasibility and effectiveness of using an ALTO approach as a first-line treatment for opioids for acute pain in the ED. A statewide dissemination of the ALTO approach in Colorado EDs is one specific intervention to Colorado's opioid crisis that should be supported and implemented as quickly as possible.

Pilot Snapshot

Number of Hospitals	10 EDs
Number of ED Visits During 2017 Intervention Period	130,631
Projected Decrease in Opioid Doses in 2017 Intervention Period Over 2016 Baseline Period (adjusted for number of visits)	35,000
Percent Change in Morphine Equivalent Units	36 percent decrease
Percent Increase ALTO Administrations	31.4 percent increase

Appendix – Colorado ACEP ALTO Chart



ALTO programs in the ED were first developed by Drs. Rosenberg and La Pietra at St. Joseph's Health in Paterson, New Jersey. Colorado is the first state to attempt to implement these protocols on a statewide basis.

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