

Evidence Bibliography: Clinical Pharmacy Practice in Pain and Opioid Stewardship

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*VA Outpatient Care: Chronic Non-Malignant Pain*

*Krichbaum M, Vartan C, Brooks A, et al. **Opioid prescribing outcomes associated with PharmD led electronic consult service for opioid tapering and opioid pharmacotherapy in a VA setting.** Federal Practitioner. 2020, accepted for publication (publication pending).*

- **Practices:** VA advanced practice pharmacist providers in pain management manage an electronic Consult (e-Consult) service where providers submit formal requests for pain pharmacotherapy recommendations.
- **Design:** Retrospective review to assess patients at the WPB VAMC and outpatient clinics who had a pain pharmacy e-Consult placed April 1, 2016 through March 31, 2017. Consults for opioid pharmacotherapy recommendations or opioid tapers were included. Providers were sent a survey to assess satisfaction with the e-Consult service and results were compared to data from surveys in November 2013 and April 2014.
- **Outcomes:** A total of 517 e-Consults were placed from April 1, 2016 through March 31, 2017. A total of 298 requests were submitted for opioid pharmacotherapy recommendations or opioid tapers; 100 consults were randomly selected for review.
  - Initial median pain scores were 6 with no change at six months post-consult. 41% of patients had a decrease in score with average drop of 3.3 points, 17% had no change, and 42% had an increase in score with average increase of 2.6 points.
  - Initial average MEDD was 177.5mg, median 165mg, range of 0-577.5mg. At 6 months post-consult, average MEDD = 71mg, median 90mg, range of 0-450mg and average MEDD decrease of 44%.
    - 18% had no change in MEDD and 5% had an increase in MEDD.

- An average of 3.5 actionable recommendations were made by the CPS Provider with 1.6 recommendations implemented within 6 months by the requesting provider.
- Of the PCP survey questions in 2014, time and access were tied for items most important to overall satisfaction and in 2018, safety had become the provider's #1 choice with time being a close second.

Seckel E, Jorgenson T, Mcfarland S. **Meeting the National Need for Expertise in Pain Management with Clinical Pharmacist Advanced Practice Providers.** *Jt Comm J Qual Patient Saf.* 2019;45(5):387-392.

- **Practices:** VA clinical pharmacy advanced practice providers in pain management with prescriptive authority under a scope of practice in a collaborative relationship with the providers they support
- **Design:** The role of VA clinical pharmacy advanced practice providers in pain management are detailed.
- **Outcomes:** Between October 1, 2016 and August 7, 2018, 35 pain management clinical pharmacists at the VA recorded 38,068 patient care encounters for 16,069 Veterans.

Giannitrapani KF, Glassman PA, Vang D, et al. **Expanding the role of clinical pharmacists on interdisciplinary primary care teams for chronic pain and opioid management.** *BMC Fam Pract.* 2018;19(1):107.

- **Practices:** Clinical pharmacists integrated into interdisciplinary primary care teams for chronic pain and opioid management at VA facilities
- **Design:** The study used a 2-part qualitative approach, including focus groups and semi-structured interviews with key informants. The purpose was to identify roles clinical pharmacists can assume in primary care team based chronic pain care and understand barriers to assuming these expanded roles. 60 members of VA primary care teams in 2 states participated in 9 preliminary interdisciplinary focus groups where a semi-structured interview guide elucidated provider experiences with screening for and managing chronic pain.
- **Outcomes:**
  - Clinical pharmacists were identified by primary care providers as playing a central role with the ongoing management of opioid therapy including review of the state prescription drug monitoring program, managing laboratory screening, medication education, promoting naloxone use, opioid tapering.
  - Barriers to clinical pharmacists' role expansion around pain care include:
    - Limitations of scopes of practice
    - Insufficient institutional support
    - Challenges and opportunities for disseminating clinical pharmacists' expanded roles

Seal K, Becker W, Tighe J, et al. **Managing Chronic Pain in Primary Care: It Really Does Take a Village.** *J Gen Intern Med.* 2017;32(8):931-934.

- **Practices:** Interdisciplinary Integrated Pain Team (IPT) clinic with pain management-trained primary care providers (PCPs), psychologist and pharmacist with access to physical and recreational therapy.
- **Design:** Quality improvement study of 162 Veterans with chronic pain who were prescribed opioids at the San Francisco VA. 81 patients enrolled in the IPT clinic were compared to 81 matched control patients seen in usual primary care during the same time period. Both groups followed for 90 days.
- **Outcomes:** The average daily opioid dose decreased by 41.2 MEDD in the IPT group after 90 days, compared to 24.8 MEDD reduction in the control group.



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- 2.6-fold increase in the odds of a  $\geq 50\%$  reduction in daily opioid use in the IPT clinic group compared to the control group ( $p=0.004$ ) during the 90 days.
- At extended follow up of 180 days, daily prescription opioid dose in the IPT clinic group was 103% lower than that of the control group ( $p=0.015$ ).
- 3.6-fold increased odds of 50% or greater reduction in opioid use in the IPT clinic group compared to the control group ( $p = 0.005$ ) at 180 days.

Jacobs SC, Son EK, Tat C, et al. **Implementing an opioid risk assessment telephone clinic: Outcomes from a pharmacist-led initiative in a large Veterans Health Administration primary care clinic, December 15, 2014-March 31, 2015.** *Subst Abus.* 2016;37(1):15-9.

- **Practices:** Telephone risk assessment clinic in primary care at the San Francisco VA led by clinical pharmacists to promote safe opioid prescribing via monthly assessment of opioid use, aberrant behaviors, side effects.
- **Design:** Pilot study conducted December 15, 2014 to March 31, 2015 that included a group of five primary care providers and their patients with chronic nonmalignant pain on chronic opioid therapy, having received prescription opioid medications for  $\geq 90$  days in the last 120 days. A risk assessment evaluation was created. Pharmacist-recommended changes to regimen and provider response to recommendation were compiled.
- **Outcomes:**
  - Of 608 patients on chronic opioid therapy, 148 assigned to pilot providers, 447 assessments completed.
  - 25 (16.8%) patients had non-VA controlled substance prescriptions, of which 14 (56.0%) patients filled a non-VA controlled substance within 3 months of the start of pilot.
  - 17 unexpected urine drug screen (UDS) results were identified from 12 patients (8.1%).
  - Pharmacists recommended 66 changes to chronic opioid prescriptions in 48 patients (32.4%): decreasing opioid quantity (33.3%), discontinuing chronic opioid therapy (22.7%), delaying medication fill (19.7%).
  - 61 of 66 (92.5%) pharmacist recommendations for regimen change were implemented by providers.
  - Chronic opioid therapy was discontinued in 14 (9.5%) patients over the course of the study.

Harden P, Ahmed S, Ang K, Wiedemer N. **Clinical Implications of Tapering Chronic Opioids in a Veteran Population.** *Pain Med.* 2015;16(10):1975-81.

- **Practices:** Opioid tapering was implemented by primary care providers, the pain management service, or the pharmacist-run pain management clinic
- **Design:** Retrospective and prospective chart review of patients prescribed chronic opioid therapy for at least 90 consecutive days with plan to taper opioid doses was conducted at the Philadelphia VA Medical Center. The purpose was to determine if patients receiving chronic opioid therapy can be tapered to lower opioid doses without a subsequent increase in pain.
- **Outcomes:**
  - Of 50 patient charts included, average percent reduction of opioid doses was 46% over 12 months.
  - 70% of patients either experienced no change in pain or less pain between baseline and 12 months.
  - An equal percentage of patients either had no change in the number of adjuvant medications prescribed or had more adjuvant medications prescribed when comparing baseline to 12 months.

Westanmo A, Marshall P, Jones E, et al. **Opioid Dose Reduction in a VA Health Care System-- Implementation of a Primary Care Population-Level Initiative.** *Pain Med.* 2015;16(5):1019-26.

- **Practices:** Opioid safety initiative (OSI) implemented at the Minneapolis VA. Endorsement from executive leadership of the health care system, monitoring of Primary Care Provider (PCP) prescribing with feedback to



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primary care teams, and pharmacist support for pain medication changes and opioid tapering were implemented. Primary care pharmacists received OSI reports for PCPs in their clinics. Pharmacists developed and discussed tapering plans with PCPs and other team members. Pharmacists assisted with case management upon request.

- **Design:** Implementation of a primary care population-level intervention to reduce high-dose (>200 MEDD) opioid prescribing. All patients receiving any prescription from the outpatient pharmacy were included from April 1, 2011 to October 1, 2014. A paper-based survey was administered to PCPs at the Minneapolis VA before and after the OSI to evaluate beliefs and attitudes about opioid prescribing.
- **Outcomes:**
  - Number of patients receiving at least one opioid prescription within 90 days decreased from 6,942 (13.7% of unique pharmacy patients) to 5,981 (11.0%, 13.8% decrease).
  - Average MEDD among those who received an opioid prescription decreased by 47% (43 → 23 MEDD).
  - Majority of PCP respondents agreed at both time points that standards of care for opioid prescribing were important and that more support was needed to care for patients with chronic pain.

Wiedemer NL, Harden PS, Arndt IO, Gallagher RM. *The opioid renewal clinic: a primary care, managed approach to opioid therapy in chronic pain patients at risk for substance abuse. Pain Med.* 2007;8(7):573-84.

- **Practices:** Pharmacist-run opioid prescription management clinic for chronic non-cancer pain supported by a nurse practitioner (NP) in primary care at the Philadelphia Veterans Affairs Medical Center. A multidisciplinary pain management team supported the clinic by meeting biweekly with the NP and clinical pharmacist to review cases and advise multimodal treatment plans.
- **Design:** Naturalistic prospective outcome study to measure the impact of a structured opioid renewal clinic. Patients were referred to the opioid renewal clinic by their PCP.
- **Outcomes:**
  - 335 patients were referred to the opioid renewal clinic.
  - Of the 171 (51%) patients with documented aberrant behaviors:
    - 77 (45%) adhered to the opioid treatment agreement (OTA) and resolved their aberrant behaviors,
    - 65 (38%) self-discharged,
    - 22 (13%) were referred for addiction treatment, and
    - 7 (4%) with consistently negative urine drug screens (UDS) were weaned from opioids.
  - 164 (49%) who were referred for complexity including history of substance abuse or need for opioid rotation or titration, with no documented aberrant drug-related behaviors, continued to adhere to OTA.
  - Use of UDS and OTA by PCPs increased. Majority of PCPs responding to the provider satisfaction survey found the program to be helpful in their practice.
  - Significant pharmacy cost savings were demonstrated.

## VA Inpatient Care

Tran NN, Discala SL, Forbes H, et al. *Pilot inpatient pain pharmacist consult service at the West Palm Beach VA Medical Center. Fed Pract.* 2018;35(1):38-46.

- **Practices:** Inpatient pain pharmacist consult service (IPPCS) available to inpatient providers via CPRS. Goal turnaround time for consult completion was 24 to 72 hours. Consults were categorized as postoperative pain, acute or chronic pain, malignant pain, or end-of-life pain. Inpatient providers could enter requests for



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assistance with 1 or more of the following: opioid dose conversions, opioid taper/titration schedules, general opioid treatment recommendations, or nonopioid/adjuvant recommendations.

- **Design:** Quality improvement project assessing the implementation of an IPPCS at a 301-bed teaching facility from November 2, 2015 through May 6, 2016.
- **Outcomes:**
  - IPPCS received 100 consult requests and completed 81% of these consults (11% forwarded to other disciplines and 8% discontinued given patients' hospital discharge prior to IPPCS review).
  - 76% (179/234) of IPPCS pharmacist medication recommendations were accepted by providers.
  - Providers implemented 100% of medication recommendations in whole for 58% (47/81) of consults.
  - 100% (15/15) of providers completing the Likert scale satisfaction questionnaire "agreed" or "strongly agreed" the IPPCS answered consults promptly with reasonable, evidence-based recommendations. All providers would recommend IPPCS to other practitioners and felt comfortable with future requests.

*Basri DS, Discala SL, Brooks AT, et al. Analysis of Inpatient Hospice Pharmacist Interventions Within a Veterans Affairs Medical Center. J Pain Palliat Care Pharmacother. 2018;32(4):240-247.*

- **Practices:** Clinical pharmacy specialist (CPS) provider service as part of a multidisciplinary team in an inpatient hospice VA setting
- **Design:** Retrospective chart review to quantify the number and types of pharmacy interventions implemented from the PhARMd tool for inpatient hospice patient encounters in a VA medical center
- **Outcomes:**
  - 453 interventions, 185 patient encounters by a CPS for inpatient hospice patients over 4 months.
  - CPS provider directly participated in pharmaceutical care of 32 hospice patients over the 4 months, averaging 14.2 interventions per patient.
  - Estimated annual unadjusted cost avoidance = \$1,417,603 for all interventions. Conservative estimate that 7% of interventions expected to prevent harm yields annualized adjusted cost avoidance of \$99,232.

#### *VA Opioid Stewardship*

*Bounthavong M, Harvey MA, Kay CL, et al. Comparison of naloxone prescribing patterns due to educational outreach conducted by full-time and part-time academic detailers at the U.S. Veterans Health Administration. J Am Pharm Assoc. 2019 Dec. S1544-3191(19)30516-3.*

- **Practices:** Pharmacists employed as academic detailers at the VA, providing naloxone-related educational outreach to primary care providers
- **Design:** A longitudinal nonequivalent control group posttest-only design using a random effects model was performed in a closed cohort of primary care providers exposed to academic detailing between September 1, 2016, and September 20, 2018, at the VA. The objective of the study was to examine the impact of full-time equivalent employee (FTEE) allocation to academic detailers on naloxone prescribing at the VA.
- **Outcomes:**
  - Providers who interacted with high FTEE academic detailers had a greater average monthly number of naloxone prescriptions prescribed compared with low FTEE academic detailers (0.60 vs. 0.53; P = 0.005).
  - 65% greater increase in the average monthly number of naloxone prescriptions prescribed among providers who interacted with a high FTEE academic detailer compared with providers who interacted with low FTEE academic detailers (P = 0.027).
  - A dose-dependent relationship between the number of naloxone prescribed and the amount of FTEE allocated was observed.

Pauly JB, Vartan CM, Brooks AT. **Implementation and evaluation of an opioid overdose education and naloxone distribution (OEND) program at a Veterans Affairs Medical Center.** *Subst Abus.* 2018;39(2):206-210.

- **Practices:** Pharmacist-led opioid overdose education and naloxone distribution (OEND) group education program consult service
- **Design:** Quality improvement project evaluating the utility of a pharmacist led OEND program from September 2015 through May 2016. Consults were placed for individual and group patient education and distribution of naloxone at the end of each class. Data was collected on participant satisfaction with education, risk for accidental overdose, and number of naloxone kits dispensed to participants.
- **Outcomes:**
  - Total of 243 consults were placed. 71 individuals participated; 69 participants were provided a naloxone kit. Many consults were discontinued due to patients' not attending scheduled education.
  - Most participants who received education had 14% risk for accidental overdose (relatively low risk).
  - Participants felt their knowledge of accidental opioid overdose increased and were generally satisfied.

Larson MJ, Browne C, Nikitin RV, et. al. **Physicians report adopting safer opioid prescribing behaviors after academic detailing intervention.** *Subst Abus.* 2018 Apr:1-7.

- **Practices:** Academic detailing pharmacist provided office-based, individualized, educational interventions related to safe opioid prescribing to physician volunteers in community practices and VA medical settings in South Carolina.
- **Design:** The study design was a single group, pre-post comparison to evaluate the academic detailing intervention intended to increase physicians' use of patient prescription history information from the state prescription monitoring program (PMP) and their adoption of clinical behaviors consistent with opioid prescription guidelines to reduce patient risk. 87 physician volunteers were included.
- **Outcomes:**
  - Of 43 respondents who did not use the PMP before intervention, 83% adopted use after intervention.
  - Self-reports also revealed a significant increase in frequency of:
    - Using patient report information from the PMP
    - Using a standardized scale to monitor pain intensity and interference with daily functioning
    - Issuing orders for urine toxicology screens for patients maintained long-term on opioids.

### *Non-VA Outpatient Care: Chronic Non-Malignant Pain*

Coffey CP, Ulbrich TR, Baughman K, Awad MH. **The effect of an interprofessional pain service on nonmalignant pain control.** *Am J Health Syst Pharm.* 2019;76(Supplement\_2): S49-S54.

- **Practices:** Pharmacist-run pain medication therapy management (MTM) service within an interprofessional non-malignant pain management team. The MTM service consisted of 2-hour group pain-educational classes led by fourth-year pharmacy students or pharmacy residents. A one-on-one 1-hour pain MTM visit with the pharmacist or pharmacy resident was scheduled 3-14 days after the initial education class. During the MTM visit, the pharmacist assesses the patient's pain, current and past treatments, and risk of opioid abuse through the Opioid Risk Tool (ORT) assessment instrument.
- **Design:** The objective of this project was to evaluate an existing interprofessional, nonmalignant pain service by measuring the difference in patient pain scores (numeric rating scale-11) before and after a pharmacist-led pain education class and MTM visit. Retrospective chart review was conducted to gather baseline data.



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Three months after the pain class and participation in the MTM visit, patients were contacted via telephone to complete a patient satisfaction survey.

- **Outcomes:**
  - The average pre-enrollment patient-reported pain score was 8.3/10 (n = 39).
  - The average post-survey patient-reported pain score was 5.6/10 (n = 39).
  - Immediate-release opioid use averaged 19.7 morphine equivalent daily dose (MEDD) at enrollment and decreased by 40% to 11.8 MEDD.
  - 80-92% provider approval rate of the pharmacist-recommended interventions was observed, which was dependent on the predesignated disease state category.

*Semerjian M, Durham MJ, Mirzaian E, et al. Clinical Pharmacy Services in a Multidisciplinary Specialty Pain Clinic. Pain Pract. 2019;19(3):303-309.*

- **Practices:** DEA-licensed, residency-trained pharmacist independently manages medications related to patients' chronic pain under a collaborative practice agreement.
- **Design:** Retrospective chart review of pharmacist visits in a specialty pain clinic at an academic medical center from October 1, 2013 to September 30, 2015.
- **Outcomes:**
  - $\geq 1$  medication-related problem was identified in 98.7% of the 380 visits included in the study
  - Pharmacist interventions included referral to appropriate providers, medication counseling, medication initiation, dose adjustment, and medication discontinuation

*Norman JL, Kroehl ME, Lam HM et al. Implementation of a pharmacist-managed clinic for patients with chronic nonmalignant pain. Am J Health-Syst Pharm. 2017; 74:1229-35.*

- **Practices:** Pharmacist-managed chronic pain clinic in a primary care setting. The clinic included one clinical pharmacist as well as pharmacy residents and students.
- **Design:** Descriptive report of the implementation of a pharmacist-managed clinic. The pharmacy team reviewed the electronic health record to determine eligible patients for the clinic. Patients were eligible if 18 years or older, received care at the internal medicine outpatient clinics, had a pain diagnosis, and were prescribed chronic opioid therapy for at least 3 months. Patients were not eligible if they had an active cancer, were terminally ill, pregnant, or if their pain medications were managed by another pain specialist.
- **Outcomes:**
  - Of the 487 eligible patients from November 2014 to March 2016, 187 (38.4%) were accepted to the clinic, 46 (9.4%) were declined, and 254 (52.2%) awaited PCP review.
  - At the time that the article was written, the pharmacist team had attempted to contact 173 of the 187 patients accepted to the clinic. 69 (39.9%) of those patients were scheduled for initial appointments.
  - Clinical outcome measures were being collected but were not reported in this article.

*Hadi MA, Alldred DP, Briggs M, et al. Effectiveness of pharmacist-led medication review in chronic pain management: systematic review and meta-analysis. Clin J Pain. 2014;30(11):1006-14.*

- **Practices:** Pharmacist-led medication review in chronic pain management
- **Design:** Systematic review and meta-analysis was conducted. Six electronic databases were searched for RCTs published in the English language involving adults with chronic pain. Studies were included if one of the intervention arms had received pharmacist-led medication review independently or as part of a

multidisciplinary intervention. Risk of bias was assessed for all the included studies. Five RCTs were included. Two trials were conducted in the United Kingdom and 1 each in Canada, Germany, and the United States.

- **Outcomes:**
  - Meta-analysis showed a statistically significant reduction in pain intensity and significant improvement in physical functioning in the intervention group compared with controls
  - The clinical significance of these findings remains uncertain due to small effect size and nature of reported data within clinical trials

**Bruhn H, Bond CM, Elliott AM, et al. Pharmacist-led management of chronic pain in primary care: results from a randomised controlled exploratory trial. *BMJ Open*. 2013;3(4)**

- **Practices:** Subjects were randomized into 3 arms:
  - Pharmacist medication review with face-to-face pharmacist prescribing;
  - Pharmacist medication review with feedback to the general practitioner (GP), no planned patient contact, or
  - Treatment as usual (TAU)
- **Design:** Exploratory RCT comparing the effectiveness of pharmacist medication review, with or without pharmacist prescribing, with standard care, for patients with chronic pain at 6 practice sites in the United Kingdom.
- **Outcomes:**
  - Pharmacist prescribing arm:
    - 130 recommendations were made for 92% of participants seen over 6 months
    - Statistically significant within arm improvement in Chronic Pain Grade (CPG) and disability subscales
    - Statistically significant improvement between arms on the intensity subscale
    - Statistically significant improvement for depression and anxiety, within the prescribing arm and between groups
  - Pharmacist review arm:
    - 197 recommendations were made for 97% of participants' records reviewed over the 6 months
    - GP feedback was provided for 48 participants. GPs fully implemented the pharmacist's recommendations for 20 patients, partially for 19 patients, and none for 9 patients
  - There was a significant within-arm improvement in overall CPG grade in the prescribing ( $p=0.003$ ) and review arm ( $p=0.001$ ), but not in the TAU arm.

**Dole EJ, Murawski MM, Adolphe AB, et al. Provision of pain management by a pharmacist with prescribing authority. *Am J Health Syst Pharm*. 2007;64(1):85-9.**

- **Practices:** Pharmacist clinician with DEA prescribing authority assumed medication management responsibilities for a clinic in Albuquerque, New Mexico. 90% of patients in this clinic were being treated for chronic non-cancer pain. A pharmacist clinician in New Mexico under the Pharmacist Prescriptive Authority Act has advanced training in physical assessment and pharmacotherapy.
- **Design:** Report of the clinical and financial outcomes of a pharmacist-managed pain clinic. The article analyzed data from 564 cases at the clinic.
- **Outcomes:**
  - Average of 150 refill requests processed per day
  - Pharmacist clinician services produced an annual revenue of \$107,550 for the healthcare system (9% return on investment based on pharmacist clinician's salary of \$98,851)



- Pharmacist clinician services produced a cost-savings of \$455,238 to all health plans served by the clinic
- Net savings of \$278,150 per year to the health plan

### *Non-VA Outpatient Care: Perioperative Pain Management*

Coulson EE, Kral LA. **The Clinical Pharmacist's Role in Perioperative Surgical Pain Management.** *J Pain Palliat Care Pharmacother.* 2020;1-7.

- **Practices:** Clinical pain pharmacist in transitional perioperative pain management at a large academic medical center. The pharmacist utilizes a collaborative practice agreement, conducting clinic and phone visits. The pharmacist works with patients to develop an individualized perioperative analgesic plan and provides education regarding surgery.
- **Design:** Report of a quality improvement project to assess the effects of a pharmacist-run transitional pain service. The enrolled patients were followed throughout their surgical course by the pharmacist, and upon discharge the pharmacist conducted follow-up phone interviews approximately weekly for up to a month. This was followed by a phone survey regarding satisfaction with this service. Referring providers were also surveyed to determine satisfaction.
- **Outcomes:**
  - 12 out of 13 (92%) patients reported they were “appreciative or very appreciative” of the pharmacist talking to them about a pain management plan both before surgery and after discharge.
  - All referring providers who responded to the survey reported they were satisfied with the pharmacist role in perioperative pain management.

### *Non-VA Outpatient and Inpatient Care: Chronic Malignant Pain and Palliative Care*

Patel JN, Boselli D, Hamadeh IS, et al. **Pain Management Using Clinical Pharmacy Assessments with and without Pharmacogenomics in an Oncology Palliative Medicine Clinic.** *JCO Oncol Pract.* 2020;16(2): e166-e174.

- **Practices:** Clinical pharmacist-led assessments of cancer pain with or without pharmacogenomic testing in an oncology palliative medicine clinic
- **Design:** Included adult patients with uncontrolled cancer-related pain assessed at baseline by a palliative medicine provider using the Edmonton Symptom Assessment Scale. Pharmacotherapy was initiated or modified accordingly. A subset of patients consented to pharmacogenomic testing. The first pharmacy assessment occurred within 1 week of baseline and a second assessment was done within another week if intervention was required. Each patient's final visit was at 1 month.
- **Outcomes:**
  - 53% of patients undergoing pharmacy assessments had pain improvement compared to 30% in historical control subjects (P < 0.001).
  - No significant difference in pain improvement between those who received (n = 43) and did not receive (n = 99) pharmacogenomic testing (56% v. 52%; P = 0.716).
  - Of the 15 patients with an actionable genotype, 73% had pain improvement.

Liu J, Wang C, Chen X, et al. **Evaluation of pharmacist interventions as part of a multidisciplinary cancer pain management team in a Chinese academic medical center.** *J Am Pharm Assoc.* 2020;60(1):76-80.

- **Practices:** Clinical pharmacist integrated into a cancer pain multidisciplinary management team at a single academic comprehensive cancer center in China.
- **Design:** Retrospective data analysis was performed to evaluate pharmacist interventions in the cancer pain management of hospitalized patients, focusing on a clinically meaningful change in drug-related problems and pain score. Hospitalized patients with moderate to severe pain who had received analgesic medication for at least 3 consecutive days were included. For patients who met the criteria for admission, a pharmacist followed up daily during hospitalization and evaluated the patient during pre- and post-intervention visits.
- **Outcomes:**
  - The pharmacist identified 12 types of pharmacotherapeutic drug-related problems.
  - The top 3 problems were nonadherence or missed doses (27.69%), inappropriate opioid selection (22.56%), and inappropriate dosage (16.41%).
  - After pharmacist intervention, drug-related problems decreased by 74.54% on average.
  - Across all visits, the changes in pain scores (mean  $\pm$  SD: 2.80  $\pm$  1.92 vs. 1.90  $\pm$  1.58,  $P < 0.05$ ) and the number of patients with mild (172 vs. 128,  $P < 0.05$ ), moderate (58 vs. 21,  $P < 0.05$ ), and severe pain (9 vs. 2,  $P < 0.05$ ) indicated a marked decrease in patients' pain levels after the inclusion of the pharmacist in the cancer pain multidisciplinary management team.

Geum MJ, Ahn JH, Kim JS, et al. **Interprofessional Collaboration Between a Multidisciplinary Palliative Care Team and the Team Pharmacist on Pain Management.** *Am J Hosp Palliat Care.* 2019;36(7):616-22.

- **Practices:** Multidisciplinary palliative care team consisting of a physician, pharmacist, nurses, and non-clinical support staff in an inpatient palliative care unit in a hospital in Korea.
- **Design:** Retrospective observational study to evaluate the impact of a multidisciplinary palliative care team and the team pharmacist on pain management. Patients 18 years of age or older who were hospitalized in the palliative care unit for 7 days or more due to worsening oncologic pain were included.
- **Outcomes:**
  - Pain intensity decreased significantly on day 7 of the palliative care unit stay compared to day 0.
  - A significant negative correlation was found between pain intensity and the proper use of analgesics ( $R = -0.407$ ;  $P < .001$ ,  $R = -0.309$ ;  $P = .001$ ,  $R = -0.241$ ;  $P = .009$ , on day -7, day 0, day 7, respectively).

Edwards Z, Ziegler L, Craigs C, et al. **Pharmacist educational interventions for cancer pain management: a systematic review and meta-analysis.** *Int J Pharm Pract.* 2019;27(4):336-345.

- **Practices:** Pharmacist-led educational interventions for cancer pain
- **Design:** A systematic review and meta-analysis of experimental trials testing pharmacist-led educational interventions for cancer pain was conducted to identify the components of these interventions and their effectiveness at improving pain related outcomes for patients with cancer. The literature review included articles published up to January 2018. Four studies were included involving 944 patients.
- **Outcomes:**
  - Pain intensity in the intervention group was reduced by 0.76 on a 0-10 scale.



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- Improvements in knowledge, side effects, and patient satisfaction were seen although with less reliable measures.

*Yamada M, Matsumura C, Jimaru Y, et al. Effect of Continuous Pharmacist Interventions on Pain Control and Side Effect Management in Outpatients with Cancer Receiving Opioid Treatments. Biol Pharm Bull. 2018;41(6):858-863.*

- **Practices:** Pharmacists provided continuous interventions related to pain management and opioid-induced side effects for outpatients with cancer. The interventions were started at the first visit of a patient for opioid introduction. After the introduction of opioid analgesics, telephone interviews and counseling were provided to patients at home between 3 and 7 days after the first visit.
- **Design:** The prospective observational study was conducted at a hospital in Osaka, Japan to evaluate the effect of continuous interventions for pain management and opioid-induced side effects in outpatients with cancer. Data was collected from all patients with cancer pain who received pharmacist interventions from October 2014 to March 2016.
- **Outcomes:**
  - Palliative care pharmacists conducted 105 interviews for 27 patients with cancer pain.
  - Pain intensities significantly decreased after the pharmacists' continuous intervention (including telephone interviews) with their appropriate recommendations and increased opioid doses.
  - Side effects such as nausea and constipation increased or remained unaffected even after the intervention, likely due to the increased opioid doses.
  - About 90% of pharmacists' recommendations for pain control were accepted by the physicians and helped to control the pain intensities.

*Ma JD, Tran V, Chan C, et al. Retrospective analysis of pharmacist interventions in an ambulatory palliative care practice. J Oncol Pharm Pract. 2016;22(6):757-765.*

- **Practices:** At the first patient visit, an oncologist or hematologist would refer the patient to a pharmacist-led outpatient palliative care clinic. The pharmacist would then evaluate and follow up with the patient at the second, third and fourth appointments. The pharmacist identified medication problems, made medication changes and assessed changes in pain scores.
- **Design:** Retrospective data analysis was conducted to evaluate pharmacist interventions and patient outcomes of a pharmacist-led palliative care clinic at an academic, comprehensive cancer center between March 2011 and March 2012.
- **Outcomes:**
  - The most common interventions by a pharmacist were a change in pain medication dose and initiation of a new medication for constipation and nausea/vomiting.
  - There was a statistically significant change in pain scores observed at the third visit, but not for the second and fourth visits

*Gagnon L, Fairchild A, Pituskin E, et al. Optimizing pain relief in a specialized outpatient palliative radiotherapy clinic: contributions of a clinical pharmacist. J Oncol Pharm Pract. 2012;18(1):76-83.*

- **Practices:** Clinical pharmacist-led outpatient palliative radiotherapy (RT) clinic
- **Design:** Observational study evaluating the interventions of a clinical pharmacist in an outpatient palliative RT clinic. Data was collected prospectively.

- **Outcomes:**
  - Clinical pharmacist interventions included screening for opioid toxicity, recommendation to change analgesic agent, and acting as a liaison with the community pharmacy.
  - 84.3% of pharmacist visits involved medication counseling on bowel routine, opioids, and hydration.

Atayee RS, Best BM, Daniels CE. **Development of an ambulatory palliative care pharmacist practice.** *J Palliat Med.* 2008;11(8):1077-82.

- **Practices:** Palliative care pharmacist via retail pharmacy integrated into a consultative ambulatory palliative care service. The pharmacist prescribed under a collaborative practice agreement in California with NPI and DEA registration.
- **Design:** Report of a palliative care pharmacist in an ambulatory care setting. The palliative care pharmacist consulted 29 new patients who had 114 clinic visits from November 2006 through August 2007.
- **Outcomes:**
  - 93% of referrals to the palliative care pharmacist were for pain management.
  - 98% of pharmacist medication recommendations were accepted by the primary care oncologist.
  - Top three useful activities of the service as reported by physicians were: 1) additional time spent with patients without physician present, 2) pain and symptom management, and 3) psychosocial support.

Lothian ST, Fotis MA, Von gunten CF, et al. **Cancer pain management through a pharmacist-based analgesic dosing service.** *Am J Health Syst Pharm.* 1999;56(11):1119-25.

- **Practices:** Pharmacist-based pain management service in an oncology unit
- **Design:** Report of the outcomes of an inpatient pharmacist-based analgesic dosing service practice
- **Outcomes:**
  - Average of 70% of analgesic omissions or incorrect orders required correction by the pharmacist.
  - Average of 3.5 recommendations per patient after pharmacist assessment.
  - Reduction in the average pain score on admission to discharge from 2.4/10 to 1.3/10.
  - 44% of patients were discharged with a pain score of 0/10.
  - Length of stay for patients with an admitting diagnosis of cancer decreased by 8% over the 3-year period.

#### *Non-VA Inpatient Care*

Ghafoor VL, Phelps PK, Pastor J, Meisel S. **Transformation of Hospital Pharmacist Opioid Stewardship.** *Hosp Pharm.* 2019;54(4):266-273.

- **Practices:** The pharmacist and nurses collaborated to identify patients with unmet pain medication needs. Then the pharmacist would adjust the patients pain medications according to the institution's protocol.
- **Design:** Pilot study of 18 patients who were provided routine clinical services on hospital patient care units by clinical pharmacists with a scope of practice over a 6-month period.
- **Outcomes:**
  - Significant reduction in the time needed for a medication order change from 408 minutes for provider authorization to 198 minutes using the pharmacist protocol.
  - 6-hour reduction in length of stay (p=0.08).

Poirier RH, Brown CS, Baggenstos YT, et al. **Impact of a pharmacist-directed pain management service on inpatient opioid use, pain control, and patient safety.** *Am J Health Syst Pharm.* 2019;76(1):17-25.

- **Practices:** Pharmacy pain management service (PPMS) consisting of three full-time clinical pharmacists with specialized training in analgesic pharmacotherapy. Pharmacists performed consultations (available to adult acute care medical-surgical floors and the intermediate ICU) and opioid stewardship functions.
- **Design:** Retrospective data analysis was performed to evaluate a PPMS. Three years of practice prior to the implementation of PPMS was compared with a 3-year period after PPMS implementation.
- **Outcomes:** The following were statistically significant outcomes after PPMS implementation:
  - Decrease in the total institutional opioid use
  - Reductions in the use of high-risk opioid medications (e.g., parenteral hydromorphone, fentanyl, transdermal fentanyl patches)
  - Increased coanalgesic and adjunctive medication use
  - Decrease in rapid response team and code blue events associated with opioid-induced oversedation

Louzon P, Jennings H, Ali M, Kraisinger M. **Impact of pharmacist management of pain, agitation, and delirium in the intensive care unit through participation in multidisciplinary bundle rounds.** *Am J Health Syst Pharm.* 2017;74(4):253-262.

- **Practices:** Intensive care unit (ICU) pharmacist-led two-phase program in a large community teaching hospital. Phase 1 of the initiative involved a pilot project to evaluate pharmacist management of sedative therapy for mechanically ventilated patients. Using a newly developed pain, agitation and delirium (PAD) order set, a pharmacist performed daily sedation management in a cohort of patients. In phase 2 of the project, an expanded group of pharmacists collaborated with interprofessional teams to manage PAD using an integrated "ABCDE bundle" to promote early mobility and weaning from sedatives and analgesics.
- **Design:** A report of a two-phase program to increase pharmacist involvement in management of PAD is detailed. The purpose of the program was to decrease ICU length of stay (LOS), ventilator use, sedative use, and hospital expenditures while advancing pharmacists' scope of practice. A retrospective comparison of data on a cohort of medical ICU patients managed using the ABCDE bundle approach and a standard-care cohort was performed.
- **Outcomes:** Relative to physician-managed standard care, pharmacist-directed sedation management resulted in fewer hours of continuous sedation, 46% reduction in patients on continuous sedative infusions, reductions in ICU and total hospital LOS. Estimated savings = \$1.2 million in direct hospital costs, \$183,216 in drug costs. Improvements in mean ventilator days per patient, ICU LOS, and mortality were observed.

Genord C, Frost T, Eid D. **Opioid exit plan: a pharmacist's role in managing acute postoperative pain.** *J Am Pharm Assoc.* 2017; 57(25):92-8.

- **Practices:** Pharmacist-led opioid exit plan (OEP) for acute postoperative pain management in the setting of neurosurgery, orthopedic, and colorectal surgery at St. Joseph Mercy Hospital in Ann Arbor, MI. Each surgery area is staffed by one pharmacist. The pharmacist's responsibilities in this program include:
  - Medication reconciliation and PDMP query prior to admission
  - Participation in interdisciplinary rounds to provide recommendations for optimal postoperative pain management
  - Assessment of outpatient prescriptions with opioid discharge counseling
  - Evaluation of prescribed pain regimen and opioid discontinuation status at post-discharge follow up appointments



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- **Design:** Descriptive report of a pharmacist-led practice model, which details the roles of pharmacists and pharmacy students upon patient admission, during postoperative recovery, and at patient discharge.
- **Outcomes:** Evaluation of outcomes of this practice are in progress.

*Tran T, Taylor SE, Hardidge A, et al. Impact of pharmacists assisting with prescribing and undertaking medication review on oxycodone prescribing and supply for patients discharged from surgical wards. J Clin Pharm Ther. 2017;42(5):567-572.*

- **Practices:** In the pre-intervention period, discharge prescriptions were prepared by hospitalists and reviewed by a ward pharmacist prior to dispensing. Post-interventions, the prescriptions were prepared by a project pharmacist in consultation with a hospitalist and then reviewed by a ward pharmacist and dispensed.
- **Design:** Retrospective data analysis was performed after a 16-week prospective pre- and post-intervention study on two surgical inpatient wards at a teaching hospital in Melbourne, Australia.
- **Outcomes:** There was a statistically significant reduction ( $p < .01$ ) in the proportion of patients who were supplied oxycodone, but not the amount supplied/patient, after ward pharmacist review of prescriptions.

*Andrews LB, Bridgeman MB, Dalal KS, et al. Implementation of a pharmacist-driven pain management consultation service for hospitalised adults with a history of substance abuse. Int J Clin Pract. 2013;67(12):1342-9.*

- **Practices:** Pharmacist-led inpatient pain management consult service for patients with concomitant substance use disorder (SUD).
- **Design:** Report of the implementation and outcomes of an inpatient pain management consult service led by clinical pharmacists.
- **Outcomes:**
  - 25% reduction in intermittent morphine, 42% in intermittent hydromorphone use after first 3 months.
  - Decreased IV intermittent opioid use corresponded with resolution of behavioral barriers as reported by all team members.
  - Nurses and physicians reported increased confidence in the pain management plan for this population and considered the program as valuable.

### *Non-VA Emergency Department Services*

*Robey-gavin E, Abuakar L. Impact of Clinical Pharmacists on Initiation of Postintubation Analgesia in the Emergency Department. J Emerg Med. 2016;50(2):308-14.*

- **Practices:** Emergency department (ED) clinical pharmacist services provided 10.5 hours per day, seven days per week. The clinical pharmacists arranged to have premixed fentanyl infusions stocked in the ED and provided education to ED staff regarding the importance of post-intubation analgesia. They also provided direct recommendations for analgesic therapy as part of the post-intubation regimen.
- **Design:** Retrospective cohort study of patients 18 years or older who underwent rapid sequence intubation (RSI) in the ED during the pre-intervention period (January 1, 2010–June 30, 2010) and post-intervention period (January 1, 2011–June 30, 2011). The purpose was to compare the rate of initiation of post-intubation analgesia before and after intervention by an ED clinical pharmacist.
- **Outcomes:**
  - Initiation of post-intubation analgesia significantly increased from 20% to 49% ( $p = 0.005$ ) after clinical pharmacist intervention.

- Average time to initiation of post-intubation analgesia decreased by 54%, from 98 minutes before pharmacist intervention to 45 minutes after pharmacist intervention.
- 50% of analgesic use in the pre-intervention group and 85% in the post-intervention group occurred during the ED clinical pharmacist duty hours.

Montgomery K, Hall AB, Keriazes G. **Pharmacist's impact on acute pain management during trauma resuscitation.** *J Trauma Nurs.* 2015;22(2):87-90.

- **Practices:** Integration of an ED clinical pharmacist within a multidisciplinary trauma resuscitation team, including trauma surgeons, emergency medicine physicians, emergency medicine residents, ED nurses, respiratory therapists, and radiology technicians. This was conducted at a community tertiary care referral hospital with a level II trauma center.
- **Design:** Retrospective chart review of patients 18 years or older, who presented to the ED via activation of the trauma alert system, and received IV hydromorphone, fentanyl, or morphine from January 1, 2009, to May 31, 2013. The purpose was to determine whether pharmacist participation on the trauma resuscitation team was associated with a decreased door-to-pain medication time and greater decrease in mean pain score from door-to-ED transfer, compared with no pharmacist being present.
- **Outcomes:** The average time to first analgesic administered decreased from 21 minutes to 17 minutes ( $p=0.03$ ) when an ED pharmacist participated in the trauma resuscitation team.

### Non-VA Opioid Stewardship: Outpatient

Cox N, Tak CR, Cochella SE, et al. **Impact of Pharmacist Previsit Input to Providers on Chronic Opioid Prescribing Safety.** *J Am Board Fam Med.* 2018;31(1):105-112.

- **Practices:** Pharmacist performed a chart review and provided recommendations for opioid management to primary care providers (PCPs) prior to each appointment for 4 months
- **Design:** Retrospective chart review evaluating the impact of a pre-visit pharmacist review of high-risk patients treated with opioids for chronic pain on compliance to guideline recommendations at a family medicine residency clinic. The study included adult patients with a PCP appointment for chronic pain who were prescribed > 50 morphine milligram equivalents per day (MEDD).
- **Outcomes:** 14% reduction in the average MEDD prescribed before and after the intervention ( $p < .001$ ), with no change in pain scores.

Tewell R, Edgerton L, Kyle E. **Establishment of a pharmacist-led service for patients at high risk for opioid overdose.** *Am J Health-Syst Pharm.* 2018; 75:376-83.

- **Practices:** Pharmacist-led naloxone clinic program within a family medicine clinic, which included education on naloxone use and the risks of opioid therapy as well as provision of naloxone.
- **Design:** Descriptive report of the implementation of a pharmacist-led naloxone clinic within a non-VA medical center.
- **Outcomes:**
  - During the first 6 months of this program, pharmacists identified 49 patients at risk for opioid overdose.
  - Pharmacists provided education to 84% of the identified patients.
  - 69% of the educated patients were confirmed to have filled a naloxone prescription.

Homsted FAE, Magee CE, Nesin N. **Population health management in a small health system: Impact of controlled substance stewardship in a patient-centered medical home.** *Am J Health-Syst Pharm.* 2017; 74:1468-75.

- **Practices:** Pharmacist-led interdisciplinary controlled substance stewardship program, which provided population health management services in a patient-centered medical home in Bangor, Maine.
- **Design:** A report of a comprehensive controlled substance stewardship program is detailed.
- **Outcomes:**
  - The number of patients receiving chronic opioids decreased by 67.2%.
  - A 65.6% decrease in the number of patients receiving benzodiazepines was observed.
  - Premature deaths were reviewed to identify associations with opioids prescribed at the time of death, which revealed a decline of 50% between 2013 and 2015.

Duvivier H, Gustafson S, Greutman M et al. **Indian health service pharmacists engaged in opioid safety initiatives and expanding access to naloxone.** *J Am Pharm Assoc.* 2017; 57(2S):135-40.

- **Practices:** Clinical pharmacist practices in the Indian Health Service (IHS) include responsible opioid prescribing, increased access to medication-assisted treatment, naloxone and community interventions.
  - Clinical pharmacist roles range from individual consultation appointments to full prescriptive authority for controlled substances in the multidisciplinary chronic pain management program.
  - Pharmacists collaborate with buprenorphine prescribers to coordinate comprehensive patient care and assist with establishing tele-medicine clinics at facilities that lack an in-house buprenorphine prescriber.
  - Pharmacists provide naloxone training for first responders in the community and collaborate to provide drug take-back programs.
- **Design:** Descriptive report of pharmacist-led opioid safety initiatives and responsibilities within the IHS
- **Outcomes:**
  - Preliminary data and feedback show appropriate identification of opioid overdose symptoms and naloxone administration by pharmacist-trained first responders
  - Increased access to naloxone kits through co-prescribing by pharmacists and first responder initiatives

Stewart A, Zborovancik KJ, Stiely KL. **The impact of pharmacy services on opioid prescribing in dental practice.** *J Am Pharm Assoc.* 2017;57(2S): S78-S82.

- **Practices:** Pharmacist review of all dental opioid orders prior to prescribing in the 74-month period
- **Design:** Retrospective chart review of opioid prescriptions written by dentists practicing in a free dental clinic for the medically underserved over a period of 74 months was performed.
- **Outcomes:**
  - Dentists were 81% less likely to prescribe opioids when pharmacy review was integrated in practice ( $p < 0.001$ ).
  - Opioid prescribing rates were 5 times greater without pharmacy service integration ( $p < 0.001$ ).
  - Fewer errors noted with pharmacy review of orders, though no statistically significant difference found.



Akers JL, Hansen RN, Oftebro RD. **Implementing take-home naloxone in an urban community pharmacy.** *J Am Pharm Assoc.* 2017; 57(2S):161-7.

- **Practices:** Pharmacist-led take-home naloxone program in a community pharmacy, which included distribution of naloxone kit prescriptions under a collaborative drug therapy agreement and provision of opioid overdose education.
- **Design:** Description of the implementation of a take-home naloxone program.
- **Outcomes:**
  - Pharmacists provided naloxone kits and opioid overdose education to older individuals compared to other programs in the area, who tended to be bystanders rather than the end users of the naloxone kits. They also provided education through community and group trainings.
  - About 1400 people were educated by pharmacists in this program.
  - 234 naloxone kits were dispensed from August 2012 to August 2016.
  - One educated group received 99 naloxone kits from August 2014 to August 2016, of these, 20 kits were successfully used to reverse opioid overdose (20.2% success rate of dispensed kits).

Cochran G, Gordon AJ, Field C, et al. **Developing a framework of care for opioid medication misuse in community pharmacy.** *Res Social Adm Pharm.* 2016;12(2):293-301.

- **Practices:** Eleven experts, including three pharmacists, from the United States and United Kingdom participated in a one-day interdisciplinary meeting at the University of Pittsburgh to discuss modification of the Screening, Brief Intervention, and Referral to Treatment (SBIRT) protocol for use in community pharmacy to address opioid medication misuse
- **Design:** Description of the results of an interdisciplinary meeting of pharmacy, addiction, intervention, and treatment experts. The Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist was used.
- **Outcomes:**
  - Modifying SBIRT for community pharmacy practice concentrated on capitalizing on the pharmacist's knowledge of medication management, particularly related to adverse events and medication adherence.
  - Interventions for acute needs should be team-based and encompass the range of disciplines that interface with medication misuse.

Kattan JA, Tuazon E, Paone D, et al. **Public health detailing—a successful strategy to promote judicious opioid analgesic prescribing.** *Am J Public Health.* 2016;106(8):1430–8.

- **Practices:** Public health campaign, including a public health pharmacist, detailing three recommendations:
  - A 3-day supply of opioids is usually enough for acute pain
  - Avoid prescribing opioids for chronic noncancer pain
  - Avoid high-dose opioid prescriptions
- **Design:** Pre- and post-intervention study conducted to evaluate knowledge and prescribing changes following a 2-month public health detailing campaign (one-to-one educational visits) about judicious opioid analgesic prescribing conducted among health care providers in Staten Island, New York City, in 2013. Prescribing data from the 3-month period before the campaign were compared with 2 sequential 3-month periods after the campaign.
- **Outcomes:**
  - Among 866 health care providers visited, knowledge increased for all 3 recommendations ( $P < .01$ ).



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- Overall prescribing rate decreased similarly in Staten Island and other New York City counties (boroughs).
- High-dose prescribing rate decreased more in Staten Island than in other boroughs (P < .01).
- Median day supply remained stable in Staten Island and increased in other boroughs.

### *Non-VA Opioid Stewardship: Acute Care*

Rizk E, Swan JT, Cheon O, et al. **Quality indicators to measure the effect of opioid stewardship interventions in hospital and emergency department settings.** *Am J Health-Syst Pharm.* 2019; 76:225-35

- **Practices:** Utilizing multi-professional stakeholders at the Houston Methodist Health System, including clinical pharmacists, project initiated to develop quality indicators used to track opioid stewardship efforts in hospital and emergency department (ED) settings. Health system consists of 7 hospitals (1 academic, 6 community) with 107,000 hospital admissions and 333,000 ED visits in 2017.
- **Design:** Literature reviewed to identify applicable quality indicators. Electronic survey of key stakeholders conducted using a 9-point Likert scale to rate validity of each indicator based on predefined criteria. Priority ranking used second electronic survey with 9-point Likert scale.
- **Outcomes:** Stakeholders developed set of 19 valid and feasible quality indicators for opioid stewardship interventions in hospital and ED settings.

### *Advocacy for Pharmacist Role in Opioid Safety*

Compton WM, Jones CM, Stein JB, Wargo EM. **Promising roles for pharmacists in addressing the U.S. opioid crisis.** *Res Social Adm Pharm.* Epub ahead of print. 2017 Dec 31.

- **Practices:** Pharmacists' roles in addressing the opioid crisis include:
  - Utilizing prescription drug monitoring programs to prevent diversion, monitor for signs of opioid misuse, and inappropriate prescribing
  - Educating patients on the risks of opioids, proper storage/disposal, and harms of sharing medications
  - Distributing naloxone kits and providing opioid overdose education
  - Providing resources and recommending addiction treatment to patients
  - Developing new addiction treatments and safer pain medications
  - Implementing research to promote improved education about neurobiology and pain management and their relationship to opioid misuse and addiction
- **Design:** Description of various roles that pharmacists play to address the opioid epidemic.
- **Outcomes:** No outcomes reported in this article.

Reynolds V, Causey H, McKee J, et al. **The Role of Pharmacists in the Opioid Epidemic: An Examination of Pharmacist-Focused Initiatives Across the United States and North Carolina.** *NCMJ.* 2017 May;78(3):202-205.

- **Practices:** Pharmacist-focus opioid stewardship practices are detailed.
- **Design:** Description of pharmacist-focused initiatives in the U.S. and in North Carolina to combat the opioid epidemic.
- **Outcomes:** No outcomes reported in this article.

Meninghan TE. **APhA emphasizes pharmacists' role in curbing opioid abuse, improving treatment.** *Pharmacy Today*. 2016; 22;6.

- **Practices:** Pharmacist-led opioid-stewardship initiatives
- **Design:** Description of the American Pharmacists Association's advocacy efforts regarding the integral role of pharmacists in addressing prescription drug abuse and supporting treatment options.
- **Outcomes:** The Comprehensive Addiction and Recovery Act of 2016 (CARA) includes grants that incentivize states to offer pharmacist-provided opioid-related education and authorize standing orders that increase access to naloxone distributed by pharmacists.

American Pharmacists Association. **Pharmacists' role in addressing opioid abuse, addiction, and diversion.** *J Am Pharm Assoc*. 2014; 54: e5-15.

- **Practices:** Pharmacist leaders in the United States participated in a conference consisting of a series of presentations related to opioid abuse, addiction and diversion, followed by workgroup sessions and group discussions focused on tools and strategies that can be used in pharmacy practice to address opioid-related issues.
- **Design:** Description of information discussed and presented at a conference held by the American Pharmacists Association on November 15, 2012.
- **Outcomes:**
  - Workgroup participants identified legislative and regulatory, healthcare provider-level, pharmacy-level, and patient-level strategies to manage risks related to opioid misuse.
  - Conference participants identified strategies to address confirmed misuse, abuse, and diversion of opioids.

**ASHP statement on the pharmacist's role in substance abuse prevention, education, and assistance.** *Am J Health-Syst Pharm*. 2014; 71:243-6.

- **Practices:** The scope of substance abuse-related responsibilities of pharmacists are detailed and focus on prevention, education and assistance.
- **Design:** Description of the pharmacist's role as healthcare providers in substance abuse prevention, education, and assistance.
- **Outcomes:** No outcomes reported in this article.