EVALUATION PROFILE FOR

Academic Detailing

OVERDOSE DATA2ACTION

Centers for Disease Control and Prevention
National Center for Injury Prevention and Control

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Purpose of the Evaluation Profile

This evaluation profile PROVIDES GUIDANCE in designing evaluations of academic detailing efforts.

This resource is meant to demonstrate how to conduct evaluations, in many cases using existing programmatic data, to produce actionable and timely findings. These findings will be used to inform program managers and stakeholders about how well initiatives are being implemented, and how effective they are at bringing about desired outcomes. This profile provides guidance on the types of evaluation questions, indicators, data sources, and data collection methods that can be used to evaluate a given prevention activity.

EVALUATION CONSIDERATIONS

CDC funded entities[1] should tailor their evaluations to stakeholder needs and the stage of development for each activity. Evaluations should serve programmatic needs to ensure high-quality initiatives are developed, reach program goals, and are tested for effectiveness.

The evolving nature of drug overdoses requires that programs strategically pivot to address emerging needs. Evaluators should remain vigilant to changing needs and look for ways to provide practical and actionable information to program implementers and decision makers.[2] Decisions surrounding the level of rigor needed for a given evaluation should be weighed and balanced by the evaluation standards of utility, feasibility, propriety, and accuracy.[3] Examples are provided throughout the profiles to show where less rigorous, but potentially more accessible, data (e.g., discussions with stakeholders, program recipient logs, meeting notes) may be useful in evaluations.

CONTENT ORGANIZATION

The following items are included:

1. **Evaluation Profile**
   The profile is organized by process and outcome evaluation subcategories to demonstrate aspects that stakeholders may want to explore at various stages of an initiative's life cycle. Evaluations often touch upon multiple subcategories; therefore, a glossary is included to provide detailed information on each subcategory.

2. **Description and Logic Model**
   The description highlights core components of each activity, and the logic model shows expected outputs and outcomes. These may help implementers and evaluators see how their own activities or initiatives may be similar or differ from the ones presented.

2 Academic Detailing

Academic detailing (AD) is a form of clinician education that uses a ONE-ON-ONE INTERACTIVE TECHNIQUE TO DELIVER UNBIASED, EVIDENCE-BASED INFORMATION to clinicians with the goal of affecting behavior change.

According to the National Resource Center for Academic Detailing, individual sessions delivered by trained detailers provide clinicians with custom-tailored resources that are relevant to their daily practice, helping them to improve patient care.[M] Based on the principles of social marketing and behavior change theory, the AD model can be adapted for specific situations.[L] Sessions can range in length and frequency depending on the clinician's availability and the behavior changes sought. Detailers deliver action-based "key messages." In the context of opioid safety, for example, a session might focus on delivering key messages about using non-opioid alternatives to manage pain, checking the state prescription drug monitoring program (PDMP), or co-prescribing naloxone with opioids. Follow-up visits allow academic detailers to assess how changes are being implemented, reinforce key messages, and address new concerns or additional topics. Between visits, detailers may also use phone, email, or in-person communication to follow up with clinicians about content covered during the detailing session and additional detailing topics.

Key components of overdose prevention academic detailing may include:

1. Planning for an AD Program

- Identify intended audience(s) (e.g., doctors, nurses, dentists, pharmacists, health systems) or region via baseline data (e.g., prescribing data, PDMP reports)
- Develop or refine key messages based on program and population needs or policy changes (e.g., optimizing non-opioid therapies, increasing medication for opioid use disorder (MOUD), becoming a buprenorphine waivered physician, decreasing opioid prescribing, reducing stigma surrounding opioid use disorder (OUD), checking the PDMP)[4]
- Recruit and train detailers[5]
- Identify and develop primary materials to support key message delivery and additional relevant educational materials to facilitate detailing sessions (e.g., pocket cards)
- Set detailing goals (e.g., number of targeted clinicians, number of detailing sessions)

2. Implementing AD

- Schedule initial sessions with identified clinicians[6]
- Deliver key messages tailored to a clinician's specific needs, and set behavior change goals
- Follow up on the key messages, and discuss behavior changes, as needed
- Continue to provide additional sessions/ resources, as needed
- Collect data on all detailing visits to support monitoring and evaluation (e.g., data may include the number of clinicians targeted, the number of visits, length of sessions, content discussed, challenges/barriers, and/or behavior change)

3. Monitoring and Evaluating AD

- Monitor program for improvement, and identify potential changes and outcomes (e.g., prescribing data, discussions with detailers)
- Share evaluation findings with stakeholders[7]
- Reassess focus of academic detailing program based on evaluation findings (e.g., key messages, region, or clinician group)

LOGIC MODEL

Academic Detailing

OVERDOSE DATA2ACTION

INPUTS

Resources

CDC's Opioid Prescribing Guideline,[a] best practices, and current literature related to evidence-based practices for prescribing opioids

Examples or lessons learned from existing AD programs like Opioid Safety & Stewardship in Detailing Directory of NaRCAD[b]

NaRCAD's Academic Detailing Toolkit for Opioid Safety[c]

CDC technical assistance and funds

Data

Drug use and misuse trends (e.g., prescription and illicit), prescribing data from Prescription Drug Monitoring Program (PDMP), and overdose trends

Needs assessments of clinician and/or patient populations (e.g., disproportionately affected populations)

Data management plan[d]

Partnerships

Local or jurisdictional partners (e.g., coalitions, harm reduction, clinicians, health systems and payers)

Schools of medicine, pharmacy, and nursing, and professional licensing boards or associations

AD experts or consultants

ACTIVITIES

Planning for AD

Identify intended audience(s) (e.g., doctors, nurses, dentists) using available baseline data[e]

Develop or refine key messages based on program or population needs and policy changes[f]

Recruit and train detailers

Identify and develop primary materials to support key messages

Set detailing goals (# of targeted clinicians, # of detailing sessions)

Implement AD

Schedule initial sessions with identified clinicians

Deliver key messages tailored to clinician needs and behavior change goals

Follow up on key messages and behavior change goals

Provide additional sessions/resources, as needed

Collect data on all detailing visits

Monitor and Evaluate AD

Monitor program for improvement and identify changes

Share evaluation findings

Reassess AD program and refine as needed

OUTPUTS

Planning

Intended audience(s) identified

AD key messages developed/refined based on needs and goals

Detailers recruited and trained

AD materials determined and created

AD program goals established

Implementation

AD sessions scheduled with clinicians, and key messages delivered and tailored to clinician needs and goals

Follow up on progress to achieve behavior change

Additional detailing sessions/resources provided, as needed

Data collected on detailing visits

Monitor and Evaluate

Program monitored and improvements made

Evaluation findings shared routinely with stakeholders

AD goals and key messages refined

SHORT-TERM OUTCOME

Systems and Community Changes

Increased understanding among collaborating healthcare partners of existing efforts to provide education and skill building for clinicians

Individual-Level

Increased prescriber knowledge of key messages[g]

Improved prescriber attitudes based on key messages (e.g., decreased stigma surrounding SUD)

Increased prescriber self-efficacy and intention to change behavior based on key messages[h]

INTERMEDIATE-TERM OUTCOME

Systems and Community Changes

Changes to clinic or healthcare system's practices and/or policies that align with key messages/best practices (e.g., prescribing opioids, managing pain, treatment)

Behavioral Changes

Prescribers

Changes in prescriber behavior based on key messages

For example:

- Increased registration and use of PDMP
- Decreased high-risk opioid prescribing
- Increased naloxone co-prescribing
- Decreased co-prescribing of opioids and benzodiazepines

Increased discussions of nonopioid medications and nonpharmacologic pain treatment options for patients with chronic pain[7]

Patients

Increased use of nonopioid medications and/or nonpharmacologic treatments for pain

LONG-TERM OUTCOME

Morbidity

Decreased rate of opioid misuse, opioid use disorder, or nonfatal overdose

Mortality

Decreased drug overdose death rate, including prescription and illicit opioid overdose death rates

[a] For more information, read CDC's Opioid Prescribing Guideline and perspective on safer opioid prescribing.

[b] For the complete Detailing Directory of NaRCAD.

[c] For NaRCAD's Academic detailing Toolkit for Opioid Safety.

[d] CDC requires recipients who collect or generate data with federal funds to develop, submit, and comply with a data management plan (DMP) for each collection or generation of public health data undertaken as part of the award and, to the extent appropriate, provide access to and archiving/long-term preservation of collected or generated data. For more information, please see CDC's DMP policy.

[e] Intended audience(s) can be identified from prescribing data in the Prescription Drug Monitoring Program (PDMP), morbidity/mortality data, needs assessments of clinicians, or changes to policies affecting specific specialties.

[f] AD key messages may be developed to cover a variety of topics based on changes to licensing board requirements, changes to the PDMP, prescribing policy changes in a given jurisdiction or health system/payer, and/or needs assessments of clinicians or patients (e.g., with SUD or chronic pain), etc.

[g] AD key messages can cover a variety of topics, including general use and navigation in the PDMP; tapering options; how to discuss nonopioid medications and nonpharmacologic pain treatment options for chronic pain; coprescribing of naloxone; providing care for people with SUD or chronic pain; decreasing stigma surrounding SUD, etc.

[h] For more information, see Guideline Resources: Clinical Tools.

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3 Process Evaluations

Process evaluations DOCUMENT AND DESCRIBE HOW A PROGRAM IS IMPLEMENTED. They normally occur when programs or initiatives are early in their development and are based on stakeholders' needs.[N]

Context

Evaluation Question

What is the overdose and/or opioid misuse burden in the jurisdiction?

How are disproportionately affected populations[8] characterized within the jurisdiction?

What factors impact the opportunities for clinicians[9] to participate in AD sessions in the jurisdiction?

Sample Indicators

Resources

- Description of laws or policies relevant to opioid misuse and/or overdose in the jurisdiction (e.g., PDMP use, prescribing guidelines, health systems/payers policies)
- Description of the current best practices promoted for clinicians in the jurisdiction on opioid prescribing
- Description of current education opportunities provided in the jurisdiction for clinicians (e.g., other academic detailing programs, grand rounds, continuing education, professional development opportunities from licensing boards or professional associations, healthcare conferences, etc.)

Partnerships

- Description of potential partners,[10] their ability to collaborate and assist with AD implementation or offer complementary activities (e.g., existing data use agreements)
- Description of collaboration plan outlining how partners will support or complement AD activities in their jurisdiction

Data[11]

- Description of clinician needs relevant AD topics, supplemental materials, availability for AD, and ongoing education
- Description of high burden population's/community's needs
- Description of patients' needs (e.g., patients with chronic pain, patients with OUD)
- Descriptions of drug use and misuse trends (e.g., prescription and illicit), prescribing data from PDMP, and overdose trends and populations most affected[12]

DATA SOURCES

- Jurisdictional policies (e.g., prescribing, licensing boards, PDMP, health payers)
- Vital statistics data
- PDMP data
- Stakeholders
- Administrative data for previous/existing clinician education
- Private data sources (e.g., IQVIA, hospital discharge/billing)
- NEMSIS and/or jurisdiction's EMS data
- Local syndromic surveillance systems
- SUDORS
- BioSense

DATA COLLECTION METHODS

- Environmental scan
- Focus groups, interviews, or surveys of clinicians, patient groups, etc.

Prescribing[13] (see appendix)

- Total number of opioid prescriptions per clinician reported monthly or quarterly[14]
- Percentage of opioid prescriptions per clinician
- Average number of opioid prescriptions per month or quarter [15]
- Average morphine milligram equivalent MME per patient[16]
- Average MME/day per prescription[17]
- Percentage of patients receiving an average daily dose of ≥90 MME of opioids[18]
- Average days' supply per opioid prescription
- Percentage of patients with overlapping opioid and benzodiazepine prescriptions

For misuse[19]

- Number of opioid overlap, defined as opioid prescriptions that overlap by seven or more days (including early refills)
- Number of opioid and benzodiazepine overlap, defined as opioid and benzodiazepine prescriptions that overlap by seven or more days
- Number of long acting/extended release (LA/ER) opioid prescriptions written for acute pain conditions; LA/ER for opioid naïve patients
- Number of high daily opioid dosage, defined as a prescribed daily dose of 90 MME or greater
- Number of multiple provider episodes (MPE)[20]

Number and percentage of changes in morbidity indicators:

- Patients receiving multiple naloxone administrations (MNAs) from emergency medical services (EMS)
- Patients transported to the emergency department (ED) for overdose by EMS where primary impression recorded in National Emergency Medical Services Information System (NEMSIS) is drug overdose
- Patients refusing transport by EMS where primary impression recorded in NEMSIS is drug overdose
- EMS calls where naloxone was administered
- All-drug non-fatal overdose emergency department visits
- Emergency department visits involving non-fatal opioid overdose, excluding heroin
- Emergency department visits involving non-fatal heroin overdose with or without other opioids
- All-drug non-fatal overdose hospitalizations
- Hospitalizations involving non-fatal opioid overdose, excluding heroin
- Hospitalizations involving nonfatal opioid overdose, excluding heroin
- Number of hospitalizations involving nonfatal heroin overdose, with or without other opioids

Mortality

- All drug overdose deaths
  - Drug overdose deaths involving opioids
  - Drug overdose deaths involving prescription opioids
  - Drug overdose deaths involving heroin
  - Drug overdose deaths involving synthetic opioids other than methadone

Reach

Evaluation Question

How many clinicians were reached through academic detailing?

Sample Indicators

Planning

- Number of academic detailers trained
- Number of partners collaborating with AD initiative (e.g., offering AD or complementary education initiatives in their organization, clinic/practice, etc.)

Implementation

- Total number of potential clinicians to be reached by AD program
- Number and percentage of clinicians detailed, percentage from within intended audience(s) (e.g., clinician specialty, health system, or region)
- Number of AD sessions conducted per clinician (including initial contact and follow-ups)
- Number of supplemental materials distributed

DATA SOURCES

- AD logs or records on initial visit reports and follow-up visits[21]
- Stakeholders and collaborating partners

DATA COLLECTION METHODS

- Document review of administrative records or monitoring data
- Discussions with stakeholders and/or collaborating partners

Dose Delivered or Received

Evaluation Question

To what extent did the intended clinicians receive AD sessions?

Sample Indicators

Implementation

- Average length of AD session conducted with intended audience(s), health system, or region
- Number and description of the topics covered in AD sessions, including follow-up sessions
- Number of clinicians who received a follow-up academic detailing session
- Number of clinicians who received multiple AD follow-up sessions
- Number of additional contacts with clinicians who received detailing (e.g., phone calls, text messages, emails)

DATA SOURCES

- Stakeholders (partners and detailers)
- AD logs or records on initial visit reports and follow-up visits

DATA COLLECTION METHODS

- Document review of administrative records or monitoring data
- Informal discussions with stakeholders (e.g., detailer peer learning groups)

Fidelity

There may be circumstances in which strict fidelity to the original plan may actually work against an intended outcome. In this case, adaptation is necessary and expected. Tracking fidelity and purposeful/data-informed deviations are important to understand implementation; however, strict fidelity should not supersede necessary adaptations that will facilitate outcomes.

Evaluation Questions

To what extent was the AD program adapted during implementation? Why was it adapted?

Sample Indicators

Overall

- → Description of changes/adaptations made to the AD program and the reasons behind the adaptation [e.g., intended audience(s), partnership collaborations outreach approach]

DATA SOURCES

- Administrative data (e.g., detailing logs or records, key messages/revisions)
- Stakeholders (academic detailers, clinicians)

DATA COLLECTION METHODS

- Reviews of data and records
- Informational phone calls with identified stakeholders
- Clinician logs

Implementation

Evaluation Questions

How feasible was it to implement the AD program given constraints of partners and clinicians?

What barriers and facilitators were encountered during planning and implementation of the AD program?

To what extent were AD efforts useful and timely? How was the overall quality?

What lessons were learned?

Sample Indicators

Overall

- → Description of feasibility in terms of scheduling, resources, partners, and funding
- → Description of lessons learned through AD planning and implementation
- → Description of barriers and facilitators during planning and implementation

Planning

- → Description of decision-making for targeting of resources, namely:
  - Identification of intended audience(s) and program needs [e.g., data sources used to identify intended audience(s)], and identification/ recruitment of detailers
  - Development of key messages and learning objectives
  - Selection of supplemental materials and types developed
- → Description of training provided to detailers and ongoing support or training
- → Description of partner collaborative efforts (e.g., additional educational opportunities created based on AD program)

Implementation

- → Description of overall quality of AD program implementation [e.g., reach, dose of intended audience(s), timeliness of follow-up, coordination with complementary activities, receptivity of clinicians to AD, etc.]

  Clinicians
  - Percentage of clinicians who reported detailing was of high quality[22]
  - Percentage of clinicians who demonstrated a willingness to continue engagement with AD or requested follow-up/additional contact[23]
  - Percentage of clinicians who reported detailing informed their clinical practice
  - Percentage of clinicians who set a behavior change goal

  Detailers
  - Description of detailers' experience providing detailing sessions (e.g., gaps in AD training curriculum, needs for additional supplemental materials, general reflections and impressions based on their detailing experience)

DATA SOURCES

- Administrative data (e.g., detailing logs or records, key messages/revisions)
- Stakeholders (academic detailers, clinicians)

DATA COLLECTION METHODS

- Informational interviews/ surveys of partners, detailers, and/or clinicians

Individual-Level Change Outcomes

Evaluation Question

For whom, and in what ways, did individual-level changes (e.g., knowledge, skills, intention, self-efficacy, behavior) occur based on AD sessions?

Sample Indicators

Short-Term

- → Clinicians
  - Changes in clinician knowledge of AD key messages (e.g., knowledge of PDMP use, tapering options, co-prescribing of naloxone, OUD
  - Changes in clinician attitudes based on AD key messages (e.g., decreased stigma surrounding SUD)
  - Changes in clinician self-efficacy and intention to enact changes based on AD key messages

Intermediate-Term

- → Clinician Prescribing[24] (see appendix)
  Behavior changes made based on AD may include changes in[25]:
  - Total number of opioid prescriptions per clinician reported monthly or quarterly[26]
  - Percentage of opioid prescriptions per clinician[26]
  - Average number of opioid prescriptions per month or quarter[27]
  - Average (morphine milligram equivalent) MME per patient[28]
  - Average MME/day per prescription[29]
  - Percentage of patients receiving more than an average daily dose of ≥90 MME of opioids (PDMP measure)[30]
  - Average days' supply per opioid prescription[30]
  - Percentage of patients with overlapping opioid and benzodiazepine prescriptions[30]

DATA SOURCES

- Administrative data (e.g., detailing logs or records, key messages/revisions)
- Stakeholders (academic detailers, clinicians)
- PDMP prescribing data
- EHR data

DATA COLLECTION METHODS

- Surveys or interviews with clinicians to assess changes
- Review of administrative data regarding detailing session
- Review of PDMP or electronic health records (pre-post analysis[10])

*Retrieved from Centers for Disease Control and Prevention. (2018) Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain. National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention, Atlanta, GA. *other measures listed are also from this same article.

New opioid prescriptions[31]:

- Percentage of patients with a new opioid prescription who have documentation that a PDMP was checked prior to prescribing
- Percentage of patients with a new opioid prescription who have documentation that a urine drug test was performed prior to prescribing
- Percentage of patients who had a follow-up visit within four weeks of starting opioids for chronic pain

Long-term Opioid Therapy (see footnote 17):

- Percentage of patients on long-term opioid therapy who have a follow-up visit every 90 days
- Percentage of patients on long-term opioid therapy who have at least quarterly pain and functional assessments
- Percentage of patients on long-term opioid therapy who have documentation that a PDMP was checked at least every 90 days
- Percentage of patients on long-term opioid therapy for whom the clinician counseled the patient on the risks and benefits of opioids at least annually
- Percentage of patients on long-term opioid therapy who have documentation that a urine drug test was performed at least annually
- Percentage of patients with chronic pain who had at least one referral to non-pharmacologic therapy as a treatment for pain
- Percent of patients on long-term opioid therapy who are prescribed naloxone
- Percentage of patients with OUD who are referred to MOUD

Patients

- Changes to use of opioid medication (increase of nonopioid medications and/or nonpharmacologic treatments for pain)
- Number of patients being referred to care for treatment of SUD and/or receiving MOUD for OUD

Community and System Change Outcomes

Evaluation Question

To what extent did the program produce or contribute to the intended community and system outcomes?

Sample Indicators

Short-term

- Increased understanding among stakeholders of existing efforts to provide education and skill-building for clinicians/health systems

Intermediate-term

- Changes over time to clinic or system's practices and/or policies (e.g., policies or practices related to opioid prescribing/tapering, co-prescribing naloxone, non-pharmacologic use/referral for treatment for pain)

DATA SOURCES

- Administrative data (logs)
- Stakeholders (clinicians and academic detailers)

DATA COLLECTION METHODS

- Surveys or interviews with stakeholders to assess changes
- Review of administrative data regarding detailing session

Unintended Outcomes

Evaluation Question

What, if any, unintended outcomes (positive or negative) were produced as a result of academic detailing?

Sample Indicators

Overall

- → Description of unintended outcomes (positive or negative) identified (e.g., further stray from best practices for prescribing or more clinicians wanting to receive academic detailing)

DATA SOURCES

- Stakeholders (e.g., academic detailers, clinicians, staff from partner organizations)

DATA COLLECTION METHODS

- Stakeholder interviews
- Review of any survey data/informational interview transcripts

Morbidity and Mortality Outcomes

Evaluation Question

What were the changes in opioid-related morbidity and mortality when comparing before and after AD sessions?

Long-Term Sample Indicators

Number and percentage changes in morbidity and mortality indicators

Morbidity

- Patients receiving multiple naloxone administrations (MNAs) from emergency medical services (EMS)
- Patients transported to the emergency department (ED) for overdose by EMS where primary impression recorded in National Emergency Medical Services Information System (NEMSIS) is drug overdoses
- Patients refusing transport by EMS where primary impression recorded in NEMSIS is drug overdoses
- EMS calls where naloxone was administered
- All-drug non-fatal overdose emergency department visits
- Emergency department visits involving non-fatal opioid overdose, excluding heroin
- Emergency department visits involving non-fatal heroin overdose with or without other opioids
- All-drug non-fatal overdose hospitalizations
- Hospitalizations involving non-fatal opioid overdose excluding heroin
- Hospitalizations involving non-fatal heroin overdose with or without other opioids

Mortality

All-drug overdose deaths

- Drug overdose deaths involving opioids
- Drug overdose deaths involving prescription opioids
- Drug overdose deaths involving heroin
- Drug overdose deaths involving synthetic opioids other than methadone

DATA SOURCES

- Jurisdictional mortality and morbidity data
- ED/health department morbidity and mortality data
- CDC WONDER
- NEMSIS and/or local EMS data
- PDMP data
- Private data sources (e.g., IQVIA, hospital discharge/billing)
- Local syndromic surveillance systems
- SUDORS
- BioSense

DATA COLLECTION METHODS

- Reviews of jurisdictional reports (e.g., annual progress reports)
- Secondary data analysis
- Review of opioid morbidity and mortality data dashboards or reports

Glossary

Collaborating partners are those who may be actively engaged with implementing a given initiative.

Medications for Opioid Use Disorder (MOUD) is the use of medications approved to treat opioid use disorder. Medications relieve the withdrawal symptoms and psychological cravings that cause chemical imbalances in the body. MOUD programs provide a safe and controlled level of medication to treat opioid use disorder and other strategies and services needed to support recovery. Definition from SAMHSA

Outcome evaluations assess progress on the sequence of outcomes (e.g., short-, intermediate-, and long-term) the intervention aims to achieve. Outcome evaluations normally occur when an intervention is established, and it is plausible to expect changes in a given timeframe. They should be planned from the beginning of an intervention, as they often rely on baseline data that need to be collected before the intervention starts.[N] Outcome evaluations may examine the following areas:

- **Individual-Level Outcomes:** The extent to which the intervention has affected changes in a given audience's knowledge, skills, attitudes, intentions, efficacy, and/or behaviors.
- **Community and System Change Outcomes:** The extent to which the intervention has affected changes in a community, organization, or system(s).
- **Unintended Outcomes:** The extent to which the intervention had unplanned or unanticipated effects—either positive or negative.
- **Morbidity/Mortality Outcomes:** The extent to which the intervention has affected changes in the target audience's morbidity or mortality.

Process evaluations document and describe how a program is implemented. Process evaluations normally occur when programs or initiatives are early in their development, and are based on stakeholders' needs.[K] Process evaluations may examine the following areas:

Context: Aspects of the larger social, political, and economic environment that may influence an activity's implementation.

Reach: The extent to which the intended target audience(s) is exposed to, or participates in an activity. If there are multiple interventions, then *reach* describes the proportion that participates in each intervention or component.

Dose delivered/received: The number (or amount) of intended units of each intervention, or each component that is delivered or provided.

- **Dose delivered** is a function of efforts of the people who deliver the intervention. The extent to which the intervention staff member (e.g., academic detailers, educators, etc.) actively engaged with, interacted with, were receptive to, and/or delivered intervention materials and resources to the target audience(s).
- **Dose received** is a characteristic of the target audience(s), and it assesses the extent of engagement of participants with the intervention.

Fidelity: The extent to which the intervention is delivered as planned. It represents the quality and integrity of the intervention as conceived by the developers. (Note: In some circumstances, strict fidelity to the original plan may actually work against an intended outcome. In these cases, adaptation is necessary and expected. Tracking fidelity and purposeful/data-informed deviations is important to understand implementation; however, strict fidelity should not supersede necessary adaptations that will facilitate outcomes.)

Implementation: The extent to which the intervention is feasible to implement and sustain, is acceptable to stakeholders, and is done with quality. Examination of these dimensions may also result in noted lessons learned, barriers, and facilitators that can help others when replicating similar initiatives.

Wraparound services are a variety of complementary services that may be needed by clients, such as primary healthcare, office-based opioid treatment, addiction care, outpatient treatment programs, inpatient treatment programs, mental health services, infectious disease treatment, obstetrics services, housing services, vocational or psychosocial rehab, and family resources.

Additional information on wraparound services can be found in these articles:

- Brooklyn, J. R., & Sigmon, S. C. (2017). Vermont hub-and-spoke model of care for opioid use disorder: development, implementation, and impact. Journal of addiction medicine, 11(4), 286.
- Stoller, K. B. (2015, December). A collaborative opioid prescribing (CoOP) model linking opioid treatment programs with office-based buprenorphine providers. In Addiction science & clinical practice (Vol. 10, No. S1, p. A63). BioMed Central.

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Appendix

Sample indicators for Context (page 8) and Individual-level Change Outcomes for Intermediate-Term Clinician Prescribing (page 14) are operationalized below:

Behavior changes made based on AD may include changes in:

- Total number of opioid prescriptions per clinician, reported monthly or quarterly:
  - **Description:** This measure can be located within the PDMP Dashboard or Prescriber Report and is based on PDMP data. These reports or dashboards may also contain specialty averages. Clinicians should review PDMP data when starting opioid therapy for chronic pain and periodically during opioid therapy for chronic pain, ranging from every prescription to every three months.
  - **Calculation:** Number of opioids prescribed by a clinician.
  - **Measurement Period:** Time period outlined in PDMP Dashboard, Prescriber Report, and/or EHR.
  - **Data Source:** PDMP Dashboard, Prescriber Report, and/or EHR.
- Percentage of opioid prescriptions per clinician:
  - **Description:** This measure can be located within the PDMP Dashboard or Prescriber Report and is based on PDMP data. These reports or dashboards may also contain specialty averages. Clinicians should review PDMP data when starting opioid therapy for chronic pain and periodically during opioid therapy for chronic pain, ranging from every prescription to every three months.
  - **Calculation:** Percent of opioid prescriptions displayed in PDMPs as an average of a clinician's patients receiving opioids and an average of opioid prescriptions written by a given clinician. These percentages may also be displayed based on MME dosage, such as 0-50, 51-90, 91-200, & > 200.
  - **Measurement Period:** Time period outlined in PDMP Dashboard or Prescriber Report.
  - **Data Source:** PDMP Dashboard or Prescriber Report.
- Average number of opioid prescriptions per month or quarter:
  - **CDC Prescribing Guideline 5:** When opioids are started, clinicians should prescribe the lowest effective dosage. Clinicians should use caution when prescribing opioids at any dosage, should carefully reassess evidence of individual benefits and risks when considering increasing dosage to 50 morphine milligram equivalents (MME) or more per day, and should avoid increasing dosage to 90 MME or more per day, or carefully justify a decision to titrate dosage to 90 MME or more per day.
  - **Description:** Used to determine overutilization by prescribers.
  - **Calculation:** The average MME per month or quarter for each opioid fill.
  - **Measurement Period:** Monthly or Quarterly.
  - **Data Source:** Bohnert, A., Guy, G. P., Jr, & Losby, J. L. (2018). Centers for Disease Control and Prevention. (2018).
- Average (morphine milligram equivalent) MME per patient:
  - **Description:** Mean daily dosage is calculated for patients that have an opioid prescription in a given quarter and refers to MME per day prescribed.
  - **Numerator:** Total number of MME prescribed.
  - **Denominator:** Total number of prescription days accounting for overlapping prescription days.
  - **Measurement Period:** Quarter.
  - **Data Source:** Strickler GK, Kreiner PW, Halpin JF, Doyle E, Paulozzi LJ. (2020).

- Average MME/day per prescription:
  - **CDC Prescribing Guideline 5:** When opioids are started, clinicians should prescribe the lowest effective dosage. Clinicians should use caution when prescribing opioids at any dosage, should carefully reassess evidence of individual benefits and risks when considering increasing dosage to 50 morphine milligram equivalents (MME) or more per day, and should avoid increasing dosage to 90 MME or more per day or carefully justify a decision to titrate dosage to 90 MME or more per day (CDC, 2018).
  - **Calculation:** The average MME per day for each opioid fill.
  - **Measurement Period:** Daily.
  - **Data Source:** Bohnert, A., Guy, G. P., Jr, & Losby, J. L. (2018).
- Percentage of patients receiving an average daily dose of ≥90 MME of opioids:
  - **CDC Prescribing Guideline 5:** When opioids are started, clinicians should prescribe the lowest effective dosage. Clinicians should use caution when prescribing opioids at any dosage, should carefully reassess evidence of individual benefits and risks when considering increasing dosage to 50 morphine milligram equivalents (MME) or more per day, and should avoid increasing dosage to 90 MME or more per day or carefully justify a decision to titrate dosage to 90 MME or more per day.
  - **Description:** The percentage of patients on long-term opioid therapy who are taking 90 MMEs or more per day.
  - **Numerator:** The number of patients taking ≥ 90 MMEs per day.
  - **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with ≥ 60 days' supply of opioids within a quarter.
  - **Measurement period:** Practice may determine the period of time. New opioid prescription: Prescribed an opioid with no opioid prescription in the previous 45 days. Long-term opioid therapy: ≥ 60 days of an opioid within a quarter. An alternative for defining long-term opioid therapy, if determining days is too difficult, is to define it as at least two consecutive opioid prescriptions in a quarter.
  - **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations, including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.
  - **Data sources:** Prescription data from the practice EHR. (CDC, 2018). Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain.
  - **Guidance to produce the measure and potential challenges:**
    - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.
    - Unknown days' supply in EHRs: Practices lacking information about days' supply could calculate the days' supply by dividing the prescription quantity by the maximum use per the sig and add up the MMEs of all opioid prescriptions.
    - Identifying benzodiazepines prescribed to patients in opioid therapy by prescribers in other practices or healthcare systems will be difficult without accessing the state's PDMP. PDMP data are not universally integrated into EHRs, so that may require an additional step.
    - If there are challenges in securing these data, a practice may wish to assess whether patients receiving long-term opioid therapy are also being prescribed benzodiazepines long-term. This can be done by assessing whether the person received at least 45 days' supply of benzodiazepines in the quarter, using the same methods employed for opioids.

→ Percentage of patients with a new opioid prescription for acute pain:

- **CDC Prescribing Guideline 6:** Long-term opioid use often begins with treatment of acute pain. When opioids are used for acute pain, clinicians should prescribe the lowest effective dose of immediate-release opioids, and should prescribe no greater quantity than needed for the expected duration of pain severe enough to require opioids. Three days or less will often be sufficient; more than seven days will rarely be needed.
- **Description:** The percentage of patients with a new opioid prescription for acute pain for three days' supply or less, or seven days or less. (Based on CDC guidelines, but state or health system policies may differ).
- **Numerator:** The percentage of patients with a new opioid prescription for acute pain for three days' supply or less, or seven days or less. (Based on CDC guidelines, but state or health system policies may differ).
- **Denominator:** The number of patients prescribed an opioid for acute pain who had no opioid prescription in the previous 45 days.
  - The following is a list of potential acute pain codes, though not exhaustive: F45.4 Pain disorders related to psychological factors; G44. Headache syndromes; G50.1 Atypical face pain; G43-G44 Migraine and other headache syndromes; G54.6 Phantom limb syndrome with pain; G89.0 Central pain syndrome; G89.1 Acute pain, not elsewhere classified; H92.0 Ear pain; H57.1 Eye pain; K08.8 Tooth pain; M25.5 Joint pain; M25.51 Shoulder pain; M54. Spine pain; M54.9 Back pain; M79.1 Myalgia; M79.6 Limb pain; N64.4 Breast pain; R07.0 Throat pain; R07.1 Chest pain on breathing; R07.9 Chest pain unspecified; R10. Abdomen pain; R10.2 Pelvic and perineal pain; R30.9 Painful urination; R51 Headache; R52 Generalized pain NOS.
- **Measurement period:** Practice may determine the period of time.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.
- **Data sources:** Prescription data from the practice EHR. (CDC, 2018). Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory and the list of extended-release/long-acting opioids.

→ Percentage of patients with overlapping opioid and benzodiazepine prescriptions:

- **CDC Prescribing Guideline Recommendation 11:** Clinicians should avoid prescribing opioid pain medication and benzodiazepines concurrently whenever possible.
- **Description:** The percentage of patients on long-term opioid therapy who received a prescription for a benzodiazepine.
- **Numerator:** The number of patients prescribed an opioid and a benzodiazepine.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with ≥ 60 days' supply of opioids within a quarter.
- **Measurement period:** Practice may determine the period of time.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for

end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.

- **Data sources:** Prescription data from the practice EHR. (CDC, 2018). Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - Unknown days' supply in EHRs: Practices lacking information about days' supply could calculate the days' supply by dividing the prescription quantity by the maximum use per the sig and add up the MMEs of all opioid prescriptions.
  - Identifying benzodiazepines prescribed to patients in opioid therapy by prescribers in other practices or healthcare systems will be difficult without accessing the state's PDMP. PDMP data are not universally integrated into EHRs, so that may require an additional step.
  - If there are challenges in securing these data, a practice may wish to assess whether patients receiving long-term opioid therapy are also being prescribed benzodiazepines long-term. This can be done by assessing whether the person received at least 45 days' supply of benzodiazepines in the quarter, using the same methods employed for opioids.

The following Sample Indicators for New Opioid Prescriptions (page 14) come from the CDC's *Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain* document (2018).

→ Percentage of patients with a new opioid prescription who have documentation that a PDMP was checked prior to prescribing:

- **CDC Prescribing Guideline Recommendation 9:** Clinicians should review the patient's history of controlled substance prescriptions using state PDMP data to determine whether the patient is receiving opioid dosages or dangerous combinations that put him or her at high risk for overdose. They should also assess whether the use of multiple prescribers and/or pharmacies suggests uncoordinated or insufficiently coordinated care. Clinicians should review PDMP data when starting opioid therapy for chronic pain and periodically during opioid therapy for chronic pain, ranging from every prescription to every three months.
- **Description:** The percentage of patients with a new opioid prescription for chronic pain with documentation that a PDMP was checked prior to prescribing.
- **Numerator:** The number of patients with a new opioid prescription for chronic pain with documentation that a PDMP was checked prior to prescribing.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older prescribed an opioid for chronic pain (see Appendix D for ICD-10 codes) who had no opioid prescription in the previous 45 days.
- **Measurement period:** One week (day of or within the week prior to prescribing).
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.

- **Data sources:** Prescription data from the practice EHR. Access to state PDMP data. A structured field in the EHR to capture that the PDMP was checked.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - Not all clinicians may be registered with the PDMP and practices' access to the PDMP embedded within an EHR may not always work. While EHRs can sometimes have a hyperlink to the PDMP or a "single sign-on" access from the EHR, an indication that the PDMP was checked for a specific patient is not captured. Practices may need to create a structured field or checkbox for clinicians to indicate the PDMP was checked. Clinicians should remember to look for benzodiazepine prescriptions from other clinicians, as well as opioids.

→ Percentage of patients with a new opioid prescription who have documentation that a urine drug test was performed prior to prescribing:

- **CDC Prescribing Guideline Recommendation 10:** When prescribing opioids for chronic pain, clinicians should administer urine drug tests before starting opioid therapy and at least annually to assess presence of prescribed opioids, as well as other controlled prescription drugs and illicit drugs.
- **Description:** The percentage of patients with a new opioid prescription for chronic pain with documentation that a urine drug test was performed prior to prescribing.
- **Numerator:** The number of patients with a new opioid prescription for chronic pain with documentation of a urine drug test.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older prescribed an opioid for chronic pain (see Appendix D for ICD-10 codes) who had no opioid prescription in the previous 45 days.
- **Measurement period:** One week (day of or within the week prior to prescribing).
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.
- **Data sources:** Prescription data from the practice EHR. Urine drug testing data in EHR and/or medical chart.
- **Guidance for producing the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name, can be used to match with EHR records. See the FDA's National Drug Code Directory and the list of extended-release/long-acting opioids.
  - Some systems may not have access to laboratory services in house or the results in a structured field. It is not only important to determine whether a patient is taking other controlled or illicit substances; it is also important to determine whether the patient is taking the medication to help prevent opioid diversion. Practices should check with the labs they use, since mass spectrometry is usually required to test for the absence of a prescribed medication. A separate order may be required for this confirmation.

→ Percentage of patients who had a follow-up visit within [4] weeks of starting opioids for chronic pain:

- **CDC Prescribing Guideline Recommendation 7:** Clinicians should evaluate benefits and harms to patients within one to four weeks of starting opioid therapy for chronic pain or of dose escalation. Clinicians should evaluate benefits and harms of continued therapy to patients every three months or more frequently. If benefits do not outweigh harms of continued opioid therapy, clinicians should optimize other therapies and work with patients to taper opioids to lower dosages, or to taper and discontinue opioids.
- **Description:** The percentage of patients with a follow-up visit within four weeks of starting an opioid for chronic pain.

- **Numerator:** The number of patients with a new opioid prescription for chronic pain with an in-person follow-up visit with the prescribing clinician within four weeks.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older prescribed an opioid for chronic pain (see Appendix C for ICD-10 codes) who had no opioid prescription in the previous 45 days.
- **Measurement period:** Four weeks (within four weeks of starting opioids).
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.
- **Data sources:** Prescription data from the practice EHR. Patient follow-up visit data from the EHR or the medical chart.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - In-person follow-ups should be conducted by the prescribing clinician. However, if it is not feasible to require that patients would have their follow-up with the prescribing clinician because of staffing, they may consider revising the measure accordingly (to indicate any clinician).
  - Telemedicine or virtual visits are considered "in-person" visits when they are already considered a part of standard care in a practice.

The following indicators for Long-term Opioid Therapy Prescriptions (page 15) come from the CDC's *Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain* document (2018).

→ Percentage of patients on long-term opioid therapy who have a follow-up visit every 90 days:

- **CDC Prescribing Guideline Recommendation 7:** Clinicians should evaluate benefits and harms with patients within one to four weeks of starting opioid therapy for chronic pain or of dose escalation. Clinicians should evaluate benefits and harms of continued therapy with patients every three months or more frequently. If benefits do not outweigh harms of continued opioid therapy, clinicians should optimize other therapies and work with patients to taper opioids to lower dosages, or to taper and discontinue opioids.
- **Description:** The percentage of patients on long-term opioid therapy who have a follow-up visit at least quarterly.
- **Numerator:** The number of patients who had at least one in-person follow-up visit with the prescribing clinician at least quarterly.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with ≥ 60 days' supply of opioids within a quarter.
- **Measurement period:** Ninety (90) days.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs,

and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.

- **Data sources:** Prescription data from the practice EHR. Patient follow-up visit data from the EHR or the medical chart.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - Unknown days' supply in EHRs: Practices lacking information about days' supply could calculate the days' supply by dividing the prescription quantity by the maximum use per the sig and add up the MMEs of all opioid prescriptions.
  - It will be challenging to determine whether a visit was related to following-up on long-term opioid therapy without a chart. A practice should consider the best way to capture visits related to opioids (e.g., create a structured field, create a registry to track last visits).
  - If it is unreasonable to require that patients would have their follow-up with the prescribing clinician because of staffing, they may consider revising the measure accordingly (to indicate any clinician).
  - If there are challenges in securing these data, a practice may wish to look at a six-month interval, and limit the analyses to persons who were receiving long-term opioid therapy consistently over that time period. Then one could count the number of visits to the prescribing physician. The simplest metric would be the percent of long-term opioid therapy patients who have at least one follow-up visit to the clinician in a six-month period.
    - Another option would be to report the percentage of long-term opioid therapy patients with at least two follow-up visits. However, it may then be necessary to extend the time period from six months to nine months to provide leeway for follow-up visits that fell slightly outside the month time window.

→ Percentage of patients on long-term opioid therapy who have at least quarterly pain and functional assessments:

- **CDC Prescribing Guideline Recommendation 2:** Before starting opioid therapy for chronic pain, clinicians should establish treatment goals with all patients, including realistic goals for pain and function, and consider how opioid therapy will be discontinued if benefits do not outweigh risks. Clinicians should continue opioid therapy only if there is clinically meaningful improvement in pain and function that outweighs risks to patient safety.
- **Description:** The percentage of patients on long-term opioid therapy who had at least quarterly pain and functional assessments.
- **Numerator:** The number of patients with documented pain and functional assessments using a validated clinical assessment tool (e.g., PEG) at least quarterly.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with ≥ 60 days' supply of opioids within a quarter.
- **Measurement period:** Ninety (90) days.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.
- **Data sources:** Prescription data from the practice EHR. PEG assessment scale data captured outside and recorded in the EHR or a structured version of the PEG available in the EHR.

- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - Unknown days' supply in EHRs: Practices lacking information about days' supply could calculate the days' supply by dividing the prescription quantity by the maximum use per the sig and add up the MMEs of all opioid prescriptions.
  - Would need to create a structured field to capture when assessments were done and, optimally, the ratings on the PEG each time.

→ Percentage of patients on long-term opioid therapy who have documentation that a PDMP was checked at least every 90 days:

- **CDC Prescribing Guideline Recommendation 9:** Clinicians should review the patient's history of controlled substance prescriptions using state prescription drug monitoring program (PDMP) data to determine whether the patient is receiving opioid dosages or dangerous combinations that put him or her at high risk for overdose. Clinicians should review PDMP data when starting opioid therapy for chronic pain and periodically during opioid therapy for chronic pain, ranging from every prescription to every three months.
- **Description:** The percentage of patients on long-term opioid therapy who had documentation that a PDMP was checked at least quarterly.
- **Numerator:** The number of patients who had documentation that a PDMP was checked at least quarterly.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with ≥ 60 days' supply of opioids within a quarter.
- **Measurement period:** Ninety (90) days.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.
- **Data sources:** Prescription data from the practice EHR. Access to state PDMP data. A structured field in the EHR to capture that the PDMP was checked.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name, can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - Unknown days' supply in EHRs: Practices lacking information about days' supply could calculate the days' supply by dividing the prescription quantity by the maximum use per the sig and add up the MMEs of all opioid prescriptions.
  - Not all clinicians may be registered with the PDMP and practices' access to the PDMP embedded within an EHR may not always work. While EHRs can sometimes have a hyperlink to the PDMP or a "single sign-on" access from the EHR, an indication that the PDMP was checked for a specific patient is not captured. Practices may need to create a structured field or checkbox for clinicians to indicate the PDMP was checked. Clinicians should remember to look for benzodiazepine prescriptions from other clinicians, as well as opioids.

→ Percentage of patients on long-term opioid therapy for whom the clinician counseled the patient on the risks and benefits of opioids at least annually:

- **CDC Prescribing Guideline Recommendation 3:** Before starting and periodically during opioid therapy, clinicians should discuss with patients known risks and realistic benefits of opioid therapy and patient and clinician responsibilities for managing therapy.

- **Description:** The percentage of patients on long-term opioid therapy for whom the clinician counseled the patient on the risks and benefits of opioids at least annually.
- **Numerator:** The number of patients the clinician counseled on the risks and benefits of opioids at least annually.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with ≥ 60 days' supply of opioids within a quarter.
- **Measurement period:** One year.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.
- **Data sources:** Prescription data from the practice EHR. Structured field indicating that counseling was provided or a signed treatment agreement housed in the EHR or the medical chart.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - Unknown days' supply in EHRs: Practices lacking information about days' supply could calculate the days' supply by dividing the prescription quantity by the maximum use per the sig and add up the MMEs of all opioid prescriptions.
  - Data that indicate that counseling was provided would potentially be captured in a clinical note, from which data is challenging to pull for measurement purposes. A practice may want to create a structured field or note template to allow this information to be readily queried from an EHR.
  - If a practice uses treatment agreements that address risks and benefits and instructs clinicians to counsel, a practice may wish to use a treatment agreement as an indicator that the patient was counseled on risks and benefits.

→ Percentage of patients on long-term opioid therapy who have documentation that a urine drug test was performed at least annually:

- **CDC Prescribing Guideline Recommendation 10:** When prescribing opioids for chronic pain, clinicians should use urine drug testing before starting opioid therapy and consider urine drug testing at least annually to assess for prescribed medications, as well as other controlled prescription drugs and illicit drugs.
- **Description:** The percentage of patients on long-term opioid therapy with documentation that a urine drug test was performed at least annually.
- **Numerator:** The number of patients with documentation of a urine drug test.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with ≥ 60 days' supply of opioids within a quarter.
- **Measurement period:** One year.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.

- **Data sources:** Prescription data from the practice EHR. Urine drug testing data in EHR and/or medical chart.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - Unknown days' supply in EHRs: Practices lacking information about days' supply could calculate the days' supply by dividing the prescription quantity by the maximum use per the sig and add up the MMEs of all opioid prescriptions.
  - Some systems may not have access to laboratory services in house or the results in a structured field. It is not only important to determine whether a patient is taking other controlled or illicit substances; it is also important to determine whether the patient is taking the medication to help prevent opioid diversion. Practices should check with the labs they use, since mass spectrometry is usually required to test for the absence of a prescribed medication. A separate order may be required for this confirmation.

→ Percentage of patients with chronic pain who had at least one referral to non-pharmacologic therapy as a treatment for pain:

- **CDC Prescribing Guideline Recommendation 1:** Nonpharmacological therapy and non-opioid pharmacologic therapy are preferred for chronic pain. Clinicians should consider opioid therapy only if expected benefits for both pain and function are anticipated to outweigh risks to the patient. If opioids are used, they should be combined with nonpharmacological therapy and non-opioid pharmacologic therapy, as appropriate.
- **Description:** The percentage of patients with chronic pain who had at least one referral or visit to nonpharmacologic therapy as a treatment for pain.
- **Numerator:** The number of patients who had at least one referral to nonpharmacologic therapy (e.g., physical therapy, exercise therapy, cognitive behavioral therapy, weight loss).
  - Current Procedural Terminology (CPT) codes cover procedures. Therapies are procedures, so the Z51.89 ICD-10 code is under a broad code for "Encounter for other specified aftercare." All outpatient clinicians use CPT codes to bill insurance along with ICD diagnoses codes. CPT codes were added for the therapies below when appropriate codes could be determined. The Healthcare Common Procedure Coding System (HCPCS) is a set of healthcare procedure codes based on the American Medical Association's (AMA) Current Procedural Terminology. Level I codes consist of the AMA CPT code and are numeric. Level II codes are alphanumeric and primarily include non-physician services such as ambulance services and prosthetic devices, and represent items and supplies and non-physician services, not covered by CPT-4 codes (Level I).
  - Some of these non-physician services may use HCPCS codes. Some of these codes include:
    - physical therapy (ICD-10: Z51.89); CPT: 97001-97039, but could also include areas noted in interventional procedure codes below),
    - exercise therapy (ICD-10: Z51.89) (CPT: 97110 = therapeutic exercises, but could add aquatic therapy, etc.),
    - cognitive behavioral therapy,
    - weight loss HCPCS/CPT Codes G0447— face-to-face behavioral counseling for obesity, 15 minutes G0473—face-to-face behavioral counseling for obesity, group (2–10), 30 minutes. The related diagnoses are: ICD-10 Codes Z68.30, Z68.31, Z68.32, Z68.33, Z68.34, Z68.35, Z68.36, Z68.37, Z68.38, Z68.39, Z68.41, Z68.42, Z68.43, Z68.44, or Z68.45, and
    - non-invasive therapies could include CPT: Therapeutic Procedures 97110 -97546, or more broadly to include Medical Nutritional Therapy, Wound Care, Acupuncture, Osteopathic Manipulations and Chiropractic care, through 98943, and more.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with chronic pain (see Appendix C for ICD-10 codes).
- **Measurement period:** Practice may determine the period of time.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure.

- **Data sources:** Prescription data from the practice EHR. Diagnosis code data from the practice EHR and procedural code data for the non-pharmacological therapy.
- **Guidance to produce the measure and potential challenges:**
  - Capturing referrals: There can be challenges measuring referrals in EHRs. Some EHRs may capture in a structured field whether a patient has been referred within the same healthcare system. However, if a patient is referred to a professional outside of the system, it may not be captured as a structured field. Some types of referrals may not be captured via anything other than a recommendation in the clinical note.
  - A practice should consider focusing on a specific chronic condition to make it easier to operationalize this measure, such as the percentage of patients with chronic low back pain who had at least one referral to physical therapy. Alternatively, focus on osteoarthritis, given how common it is.
  - Another challenge may be that patients who have had a chronic condition for several years may have been referred to nonpharmacological therapy years ago, which would be difficult to capture.
  - If there are challenges in securing these data, a practice may wish to focus on patients on long-term opioid therapy (as the denominator), although the measure could worsen over time if patients are being put on nonpharmacologic therapy instead of opioids.
    - Alternatively, a practice could calculate the percentage of patients with chronic low back pain who had at least one referral to physical therapy.
  - If a practice wants to define appropriate nonpharmacologic pain treatments for a particular condition and develop an operational definition of the initiation of an episode of care, they could track the percent of patients who received an appropriate nonpharmacologic treatment.

→ Percent of patients on long-term opioid therapy who are prescribed naloxone:

- **CDC Prescribing Guideline Recommendation 8:** Before starting and periodically during continuation of opioid therapy, clinicians should evaluate risk factors for opioid-related harms. Clinicians should incorporate into the management plan strategies to mitigate risk, including considering offering naloxone when factors that increase risk for opioid overdose, such as history of overdose, history of substance use disorder, higher opioid dosages (≥50MME/d), or concurrent benzodiazepine use, are present.
- **Description:** The percentage of patients on long-term opioid therapy who were counseled on the purpose and use of naloxone, and either prescribed or referred to obtain naloxone.
- **Numerator:** The number of patients counseled on the purpose and use of naloxone, and either prescribed or referred to obtain naloxone.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with ≥ 60 days' supply of opioids within a quarter AND on ≥ 50 MMEs per day, OR diagnosis of opioid use disorder (OUD), OR diagnosis of substance abuse, OR taking benzodiazepines concurrently, OR a diagnosis of restrictive or obstructive lung disease, and/or sleep apnea.
- **Measurement period:** Practice may determine the period of time.
- **Exclusions:** Exclusion criteria include cancer patients (ICD-10 codes C00-D09 are "cancers," malignant neoplasms; ICD-10 codes D10-D3A are benign neoplasms; ICD-10 codes D37-D48 are neoplasms of uncertain behavior; and ICD-10 code D49 is a neoplasm of unspecified behavior—could be malignant, but not known [Appendix D]), palliative care and end-of-life care. Palliative care is identified with a principal ICD-10 code of terminal condition with (Z51.5), and end-of-life care patients would be identified using a procedure or CPT code. Note: identifying end-of-life care patients may be difficult to systematically capture; palliative care may be a sufficient proxy for end-of-life care. Patients who transfer into the practice may be excluded from the measure. Additional exclusion criteria are: (1) drugs not typically used in outpatient settings, such as cough and cold formulations including elixirs, and combination products containing antitussives, decongestants, antihistamines, and expectorants; (2) all other prescribed opioids not included on this list of commonly prescribed opioids; (3) buprenorphine products indicated as medications for opioid use disorder (MOUD), identified by ICD-10 codes.
- **Data sources:** Prescription data from the practice EHR. Naloxone counseling and referral data from the EHR or medical chart review.
- **Guidance to produce the measure and potential challenges:**
  - Identifying opioid medications: EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name can be used to match with EHR records. See the FDA's National Drug Code Directory.

- Unknown days' supply in EHRs: Practices lacking information about days' supply could calculate the days' supply by dividing the prescription quantity by the maximum use per the sig and add up the MMEs of all opioid prescriptions.
- Capturing referrals: There can be challenges measuring referrals in EHRs. Some EHRs may capture in a structured field whether a patient has been referred within the same healthcare system. If a patient is referred to a professional outside of the system, it may not be captured as a structured field. Some types of referrals may not be captured via anything other than a recommendation in the clinical note.
- Counseling is not captured as a structured field in EHRs. Practices may have to create a field or checkbox to indicate counseling was provided.

- **Alternatives for the Measure:** If a practice is unable to identify patients in ALL risk categories, an alternative is to identify those in risk categories that are feasible (e.g., ≥ 50 MMEs or concurrent use of benzodiazepines). Practices may want to examine the percentage who received a naloxone prescription, separately from whether counseling was provided. The former may be more readily available in most practices' existing data, and separating these two may facilitate better clarity on what to target for improvement.

→ Percentage of patients with OUD who are referred to MOUD:

- **CDC Prescribing Guideline Recommendation 12:** Clinicians should offer or arrange evidence-based treatment (usually medications for opioid use disorder, including naltrexone, buprenorphine, or methadone in combination with behavioral therapies) for patients with opioid use disorder.
- **Description:** The percentage of patients with an opioid use disorder who were referred to or prescribed medications for opioid use disorder.
- **Numerator:** The number of patients who were referred to a methadone treatment program, or were prescribed/referred for treatment with naltrexone, buprenorphine, or buprenorphine/naloxone.
- **Denominator:** The number of patients in an outpatient panel of patients 18 years of age or older with a diagnosis of opioid use disorder.
- **Measurement period:** Practice may determine the period of time.
- **Exclusions:** Some formulations of buprenorphine (e.g., belbuca, butrans) are prescribed for pain, these would need to be excluded.
- **Data sources:** Prescription data from the practice EHR. Diagnosis data for OUD in EHR. Referral data in EHR or medical chart for medications for opioid use disorder or prescription data for naltrexone or buprenorphine/naloxone.
- **Guidance to produce the measure and potential challenges:**
  - EHRs may not be able to identify all opioid medications reliably. The associated National Drug Code (NDC), generic name, and product name, can be used to match with EHR records. See the FDA's National Drug Code Directory.
  - Capturing referrals: There can be challenges measuring referrals in EHRs. Some EHRs may capture in a structured field whether a patient has been referred within the same healthcare system. If a patient is referred to a professional outside of the system, it will not be captured as a structured field. Some types of referrals may not be captured via anything other than a recommendation in the clinical note.
  - Practices may need to create a field in the EHR to capture referrals for MOUD, since methadone clinics are often separate entities.
- **Alternatives for the Measure:**
  - Practices could focus on measuring specific MOUD, based on what your patient panel has access to or where your practice is aiming to improve access.
  - The simplest measure would be the percentage of the adult population (or the number per 1,000 population) using buprenorphine. Tracking this over time would be useful for tracking whether these drugs were being prescribed more frequently.
  - In order to link prescribing of buprenorphine to patients who have received opioids for chronic pain, one option might be to measure the percentage of persons who received long-term opioid therapy at any time in a year who also received buprenorphine in the same year. This would provide a rough indication of the rate of transition from prescription opioids to MOUD.

Endnotes

[1] Recipients can be state, district, county, or city health departments, tribal health organizations, or other bona fide agents of the health department.

[2] See Improving the Use of Program Evaluation for Maximum Health Impact: Guidelines and Recommendations for more information on how large programs use evaluation findings to improve their interventions and inform strategic direction. Furthermore, evaluation approaches like developmental evaluation or rapid feedback evaluations may be helpful models for evaluators to use while working on overdose prevention efforts.

[3] CDC Evaluation Standards: https://www.cdc.gov/eval/standards/index.htm

[4] AD key messages can be developed to cover a variety of topics based on changes to licensing board requirements, changes in trend data, changes in the needs of the program or population, changes to the PDMP, prescribing policy changes in a given jurisdiction or health system/payer, needs assessments of clinicians or patients (e.g., with substance use disorder or chronic pain), etc.

[5] Ideal candidates to complete the training and become successful academic detailers have a background in healthcare (e.g., nurses, pharmacists, clinicians) or public health (e.g., health department staff, public health specialists, health educators), are familiar with the topic area and the community in which the detailing takes place, and exhibit excellent communication and interpersonal skills.

[6] Depending on program resources and staffing, scheduling of visits may be done directly by academic detailers or may be done by other program personnel.

[7] Stakeholders may include clinicians, healthcare payers, healthcare systems, quality improvement coordinators, licensing boards, professional healthcare associations, medical schools, regional coalitions, and patients and/or their caregivers. Stakeholders are a broader group than collaborating partners. Collaborating partners are those who may be actively engaged with implementing the AD initiative.

[8] Disproportionately affected populations may include people with opioid use disorder (OUD), justice-involved populations, disproportionately affected populations (e.g., African Americans, Native American/American Indian, pregnant women, seniors, people who lack access to health insurance/care), or those who experience high rates of prescribing, morbidity or mortality, and naloxone administration.

[9] Clinicians can include medical, dental, or pharmacy practitioners.

[10] Potential partners may include local or jurisdictional partners (e.g., coalitions, harm reduction, health systems and payers), schools of medicine (pharmacy or nursing), professional licensing boards or associations, and academic detailing experts or consultants.

[11] CDC requires recipients who collect or generate data with federal funds to develop, submit, and comply with a data management plan (DMP) for each collection or generation of public health data undertaken as part of the award and, to the extent appropriate, to provide access to and archiving/long-term preservation of collected or generated data. For more information, please see CDC's DMP policy.

[12] Stratified by subpopulation (e.g., race/ethnicity, age, etc.) when relevant and data are available.

[13] Prescribing metrics listed here are commonly reported within state PDMPs. Retrieved from Bureau of Justice Assistance, Office of Justice Programs, U.S. Department of Justice, & Brandeis University. (2016). Technical Assistance Guide: Prescriber Report Cards. *Prescription Drug Monitoring Program Training and Technical Assistance Center*. Calculations for these sample indicators are also outlined in the Appendix.

[14] Total number and percent of opioid prescriptions can be displayed in PDMPs as an average of a clinician's patients receiving opioids and an average of opioid.

[15] Retrieved from Bohnert, A., Guy, G. P., Jr, & Losby, J. L. (2018).

[16] For more information about these measures see Strickler GK, Kreiner PW, Halpin JF, Doyle E, Paulozzi LJ. (2020).

[17] Retrieved from Bohnert, A., Guy, G. P., Jr, & Losby, J. L. (2018).

[18] Retrieved from Centers for Disease Control and Prevention. (2018). *Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain*. National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention, Atlanta, GA. *other measures listed are also from this same article.

[19] Misuse measures from (Liu, Y., et al., 2013) have been updated to align with the CDC Opioid Prescribing Guideline.

[20] A multiple provider episode (MPE) is an instance in which a patient fills a prescription from five or more prescribers at five or more pharmacies for drugs of a particular class within a six-month period (Paulozzi, L. J., Strickler, G. K., Kreiner, P. W., & Koris, C. M., 2015).

[21] AD visit logs may track the clinician's name and practice; type of contact made; date, length, and content covered during detailing session; barriers the clinician disclosed; the clinician's current stage along a prescribing spectrum; next steps the detailer may take to progress the clinician along the spectrum; next steps for follow-up; scheduling details; detailer impressions of the session, the practice, or clinician; resources provided; additional education or resource needs; etc.

[22] The content of AD sessions was relevant/important to the clinician's practice; the resources and information received during AD sessions was useful to the clinician; detailer is seen as a trustworthy source of information; detailers were able to answer clinician's questions; detailers provided timely follow up sessions; materials were useful to clinician's daily practice.

[23] Follow-up AD visits or additional contact via telephone call, text message, or email.

[24] Prescribing metrics listed here are commonly reported within state PDMPs. Retrieved from Bureau of Justice Assistance, Office of Justice Programs, U.S. Department of Justice, & Brandeis University. (2016). Calculations for these sample indicators are also outlined in the Appendix.

[25] Clinician's behavior change goals are often set at the end of AD sessions. Evaluators may use these measures in a pre-post comparison to assess clinician behavior change. Pre-AD baseline data could be gathered for three months prior to the AD sessions, using a full month to 90 days of prescribing data for a given clinician. A post-AD comparison could then use at least three and up to six months' post intervention data (with ongoing checking quarterly to see if behaviors are reverting back to old practices over time). Data analysis should be done per clinician and at the practice-level (to be able to compare individuals to the larger group). The outcomes selected should match the content of the academic detailing or clinician education. For example, if prescribing naloxone or not co-prescribing opioids and benzodiazepines is covered in the education/detailing, then those outcomes would be picked.

[26] Total number and percent of opioid prescriptions can be displayed in PDMPs as an average of a clinician's patients receiving opioids and an average of opioid prescriptions written by a given clinician. These percentages may also be displayed based on MME dosage, such as 0-50, 51-90, 91-200, and > 200.

[27] Retrieved from Bohnert, A., Guy, G. P., Jr, & Losby, J. L. (2018).

[28] For more information about these measures, see Strickler GK, Kreiner PW, Halpin JF, Doyle E, Paulozzi LJ. (2020)

[29] Retrieved from Bohnert, A., Guy, G. P., Jr, & Losby, J. L. (2018).

[30] Retrieved from Centers for Disease Control and Prevention. (2018). *Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain*. National Center for Injury Prevention and Control, Division of Unintentional Injury Prevention, Atlanta, GA.

[31] These indicators are operationalized in CDC's Quality Improvement and Care Coordination: Implementing the CDC Guideline for Prescribing Opioids for Chronic Pain.