

# CDC OPIOID GUIDELINE

## *Implementation Guide for Electronic Health Records*

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**NOVEMBER 2018**

Developed by members of the  
Opioid Crisis Task Force's  
Clinician Impact Subgroup  
**Electronic Health Record Association**





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# EHRA Opioid Crisis Task Force

The *CDC Opioid Guideline – Implementation Guide for EHRs* was conceived and developed by representatives from the following EHRA member companies, who volunteered their time and expertise to the Opioid Crisis Task Force.

- Allscripts Healthcare Solutions
- Cerner Corporation
- Epic
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- Foothold Technology
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- Greenway Health
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- MEDHOST, Inc.
- MEDITECH, Inc.
- Modernizing Medicine
- NextGen Healthcare
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# Introduction

The Electronic Health Record Association (EHRA) is committed to bringing leaders from our EHR developer community together to collaborate on solving industry challenges. In 2018, the Association's **Opioid Crisis Task Force** was formed to research and provide recommendations on ways EHR technology can help with solving the complex puzzle of the opioid crisis. One area that the Task Force has researched is clinical practice guidelines that can be operationalized to improve opioid stewardship in clinical practice.

Clinical practice guidelines can be designed to yield better patient experience and outcomes, improve safety, and reduce unwarranted variation in care. Despite the wealth of available clinical practice guidelines that are validated, published, and freely available, clinical adoption of guidelines is very slow—some studies show as much as a 17-year lag between research that produces guidelines and the common use in practice of new guidelines.<sup>1</sup>

A major contributor to lack of adoption is the lack of content available in a provider's EHR workflow to support their utilizing the guideline.

In 2016, the Centers for Disease Control and Prevention (CDC) published the CDC Guideline for Prescribing Opioids for Chronic Pain, which aims to improve the safety of pain management and increase patient engagement.<sup>2</sup> Though this guideline is often cited by care professionals who treat pain, it is seldom and inconsistently utilized in clinical practice.

With the creation of this Implementation Guide for Electronic Health Records, the EHR Association's goal is to enable an organization's healthcare information technology (IT) team to more rapidly implement these CDC guidelines using EHR-based clinical decision support tools. In addition, the EHR developer community can use this implementation guide to steer future development of new products and services that can help hospitals, physician practices and other care environments implement these important CDC guidelines.

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<sup>1</sup> Morris, Z. S., Wooding, S., & Grant, J. (2011). The answer is 17 years, what is the question: understanding time lags in translational research. *Journal of the Royal Society of Medicine*, 104(12), 510–520. <http://doi.org/10.1258/jrsm.2011.110180>

<sup>2</sup> Dowell D, Haegerich TM, Chou R. CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016. *MMWR Recomm Rep* 2016;65(No. RR-1):1–49. DOI: <http://dx.doi.org/10.15585/mmwr.rr6501e1>



# Overview

## ***Intended Audience***

This Implementation Guide for Electronic Health Records is designed to assist the information technology team of healthcare provider organizations to more rapidly design and implement clinical decision support for clinicians who treat and manage pain.

Not all recommendations will be equally applicable to every clinical environment.

<b>Target Healthcare Provider Organizations</b>	<b>Exclusions</b>
<ul style="list-style-type: none"><li>▪ Ambulatory specialty clinic</li><li>▪ Ambulatory surgery center</li><li>▪ Federally qualified health center</li><li>▪ Home health</li><li>▪ Hospital</li><li>▪ Hospital outpatient surgery center</li><li>▪ Primary care</li></ul>	<ul style="list-style-type: none"><li>▪ Behavioral Health</li><li>▪ Long-term care</li><li>▪ Retail pharmacy</li><li>▪ Palliative care</li><li>▪ Cancer treatment centers</li></ul>
<p><i>Note: This is not a comprehensive list of stakeholders and roles. Include all applicable stakeholders in your organization's opioid stewardship initiatives.</i></p>	



## **Additional Clinical Stakeholders**

The CDC Guidelines apply primarily to physician, physician assistant, and advanced practice nurse prescribers of opioids making treatment decisions in the management of chronic pain, but there are many other clinical roles that help provide opioid stewardship in the management of chronic pain. When implementing these clinical guidelines, also consider related non-physician roles.

<b>Clinical Role</b>	<b>Related Workflow</b>
Care Manager	<i>E.g. patient engagement during pain management regimen</i>
Case Manager	<i>E.g. patient engagement for suspected or confirmed substance use disorder</i>
Clinical Pharmacist	<i>E.g. establishing and documenting patient goals, patient engagement and education during inpatient stay and/or discharge</i>
Nurse	<i>E.g. establishing and documenting patient goals, patient engagement and education during inpatient stay and/or discharge</i>

*Note: This is not a comprehensive list of stakeholders and roles. Include all applicable stakeholders in your organization's opioid stewardship initiatives.*

## **Change Management**

Each of the CDC guidelines referenced in this guide impact a variety of medical services. We recommend that leadership from all services and departments be included when changes to clinical practices, workflow, or EHR content are considered.



# CDC Recommendations

In their 2016 guideline,<sup>3</sup> the CDC provides 12 recommendations for prescribing opioids for chronic pain outside of active cancer, palliative, sickle cell disease, and end-of-life care. In addition to the full report, the CDC has also published a two-page summary<sup>4</sup> of the recommendations.

In this implementation guide, the EHR Association has provided commentary on each statement regarding the role technology can play in operationalizing each of the CDC recommendations. In addition, EHRA provides a menu of specific options for implementing these solutions. These options are organized from simplest to most complex and should be tailored to each organization's practice, protocols, and state laws.

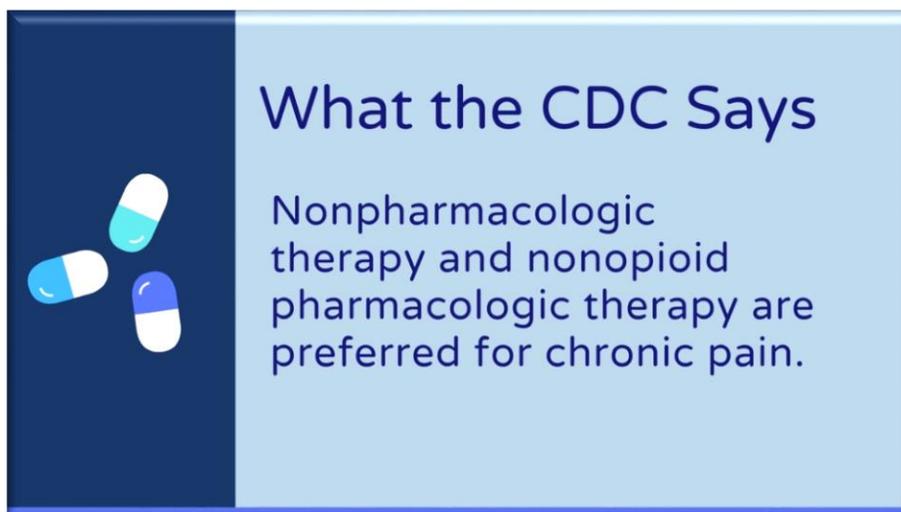
- |  |  |   |
|--|--|---|
| 1. Opioids are not front line therapy          | 2. Establish goals for pain and function                   | 3. Discuss risks and benefits               |
| 4. Use immediate-release opioids when starting | 5. Use the lowest effective dose                           | 6. Prescribe short durations for acute pain |
| 7. Evaluate benefits and harms frequently      | 8. Use strategies to mitigate risks                        | 9. Review PDMP data                         |
| 10. Use urine drug testing                     | 11. Avoid concurrent opioid and benzodiazepine prescribing | 12. Offer treatment for opioid use disorder |

<sup>3</sup> CDC Guideline for Prescribing Opioids for Chronic Pain — United States, 2016. Retrieved from <https://www.cdc.gov/mmwr/volumes/65/rr/pdfs/rr6501e1.pdf>.

<sup>4</sup> CDC Guideline for Prescribing Opioids for Chronic Pain [https://www.cdc.gov/drugoverdose/pdf/Guidelines\\_Factsheet-a.pdf](https://www.cdc.gov/drugoverdose/pdf/Guidelines_Factsheet-a.pdf).



## **1. Opioids are not a first-line therapy**



### **How Technology Can Help**

EHRs provide the platform for order entry and treatment selection, so there are natural opportunities to guide clinicians towards the selection of nonpharmacologic therapies as a first line approach to pain management.

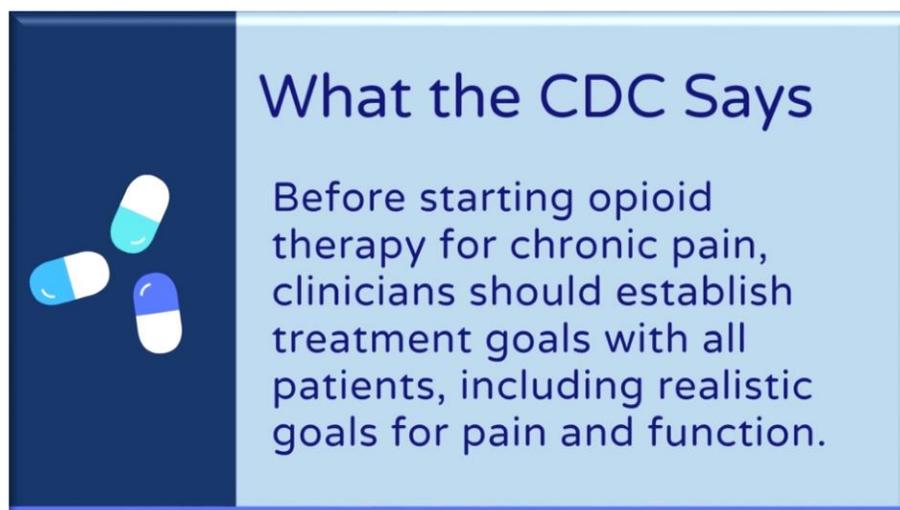
### **What You Can Do**

- Review specific non-opioid treatments and alternative pain management strategies recommended by the CDC<sup>5</sup> and other evidence-based sources.
- Adopt advisory text in order sets that remind providers to begin with nonpharmacologic therapy.
- Utilize passive clinical decision support in order sets by placing opioid orders below other analgesics and NSAIDS, or nested under drop-down headers.
- Utilize active clinical decision support at the point of ordering opioids to check if nonpharmacologic therapy has been tried yet, and suggest non-pharmacologic orders if applicable.

<sup>5</sup> CDC. (2016, April 217). *Nonopioid treatments for chronic pain*. Retrieved from [https://www.cdc.gov/drugoverdose/pdf/nonopioid\\_treatments-a.pdf](https://www.cdc.gov/drugoverdose/pdf/nonopioid_treatments-a.pdf)



## ***2. Establish goals for pain and function***



### **How Technology Can Help**

Clinicians are responsible for assessing a patient's pain, function and comfort during an encounter. The EHR can be configured to capture future pain and functional goals, and clinicians can document on those goals during each encounter. That data can then be trended over time to view how a patient is progressing towards meeting their goals.

### **What You Can Do**

- Build documentation templates that include fields to capture pain goals and functional goals, as well as plans to address any failure to comply with these goals. Consider making these fields required.
- Incorporate pain and functional goals into care plans, chart displays, and reports used for pain management.
- Introduce active clinical decision support to make pain and functional goal fields required in documentation when a patient is currently on opioid therapy.
- Implement an EHR-based Opioid Treatment Agreement (formerly called a pain contract) that establishes targets for pain and functional goals. In addition, use EHR analytics to monitor and improve adherence to opioid treatment agreements for chronic pain populations, as well as monitoring compliance with regulatory requirements (see Appendix A).



### **3. Discuss risks and benefits**



**What the CDC Says**

Before starting and periodically during opioid therapy, clinicians should discuss with patients known risks and realistic benefits of opioid therapy.

#### **How Technology Can Help**

In addition to verbal discussions, physicians can provide patients with educational materials that cover the risks and benefits of using opioid therapy.

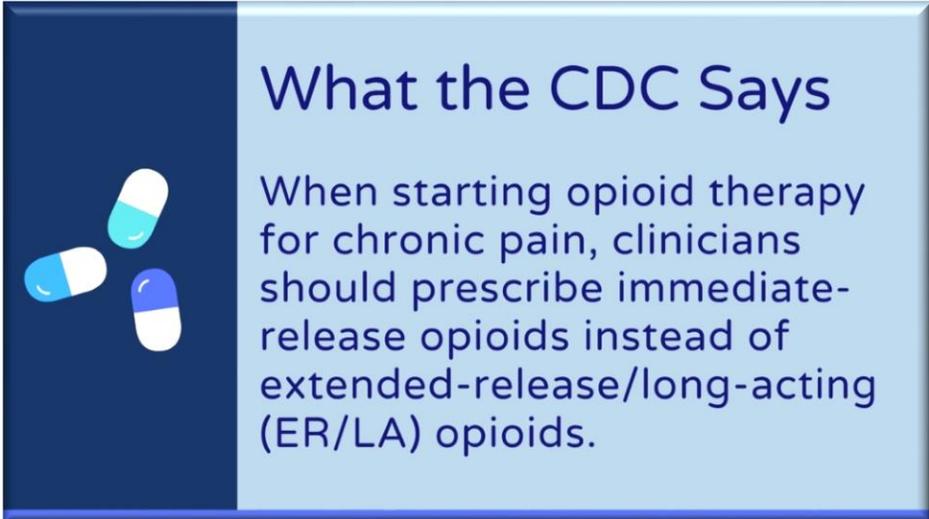
#### **What You Can Do**

- Incorporate guidelines for opioid use, including risks and benefits, in patient education materials. Make those materials available at the point of discharge, as well as accessible on the patient portal.
- Utilize a nursing-driven education tracking solution within the EHR to ensure that patients receive appropriate opioid education at each applicable encounter. Also make opioid education materials available through downloads and patient portals.
- Utilize a discharge planning solution within the EHR to set up pharmacy consultations for inpatients on opioid therapy who will continue on opioid therapy after discharge.
- Provide clinicians with links to recommendations from the CDC<sup>6</sup>; provide access to this information within order sets and protocols.

<sup>6</sup> CDC. *Assessing Benefits and Harms of Opioid Therapy*. Retrieved October 2018 from [https://www.cdc.gov/drugoverdose/pdf/Assessing\\_Benefits\\_Harms\\_of\\_Opioid\\_Therapy-a.pdf](https://www.cdc.gov/drugoverdose/pdf/Assessing_Benefits_Harms_of_Opioid_Therapy-a.pdf)



## ***4. Use immediate-release opioids when starting***



**What the CDC Says**

When starting opioid therapy for chronic pain, clinicians should prescribe immediate-release opioids instead of extended-release/long-acting (ER/LA) opioids.

### **How Technology Can Help**

Clinicians can utilize the EHR to document if a patient is opioid naive or tolerant, and that information can inform the selection of immediate release opioid treatment at the point of ordering.

In addition, a patient's medication history as provided by pharmacy records, PDMPs, and medication reconciliation can provide clinicians with information about opioids the patient has already taken, as well as help determine if extended release (ER) or long acting (LA) opioids are warranted.

### **What You Can Do**

- Implement a process for capturing if a patient is opioid tolerant or naive. Make that information available at the point of ordering.
- Adopt advisory text in order sets that remind providers to begin with immediate release opioids.
- Utilize passive clinical decision support in order sets by placing immediate release opioids first, and/or removing extended release opioids from sets all together.
- Utilize pre-built or automated dose calculations for opioid orders.
- Utilize active clinical decision support to prevent the ordering ER/LA opioids on opioid naive patients, and suggest immediate release opioid orders or other alternatives if applicable.



## 5. Use the lowest effective dose



### What the CDC Says

When opioids are started, clinicians should prescribe the lowest effective dosage. Clinicians should... carefully reassess evidence of individual benefits and risks when considering increasing dosage to  $\geq 50$  morphine milligram equivalents (MME)/day, and should avoid increasing dosage to  $\geq 90$  MME/day.

### How Technology Can Help

Technology tools can perform mathematical calculations to generate a patient's daily Milligram Morphine Equivalent (MME). Clinicians should implement an MME calculator solution in order to monitor a patient's opioid levels and ensure compliance with the CDC-established risk thresholds.

### What You Can Do

- Review guidance from the CDC on MMEs.<sup>7</sup> Educate clinicians on MMEs and how to use them in clinical practice.
- Implement an MME calculator solution, which enables clinicians to monitor their patient's MME loads.
- Utilize active decision support to warn physicians when a patient's opioid dosage exceeds CDC risk thresholds, and prompt physicians to consider maintenance or a slow taper.
- Create unit or service dashboards to monitor MMEs at an aggregate level, with the ability to drill down to the provider and patient-level to track and trend overall opioid utilization.

<sup>7</sup> CDC. *Calculating Total Daily Dose of Opioids for Safe Dosage*. Retrieved October 2018 from [https://www.cdc.gov/drugoverdose/pdf/calculating\\_total\\_daily\\_dose-a.pdf](https://www.cdc.gov/drugoverdose/pdf/calculating_total_daily_dose-a.pdf)



## 6. *Prescribe short durations for acute pain*



### What the CDC Says

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.

### **How Technology Can Help**

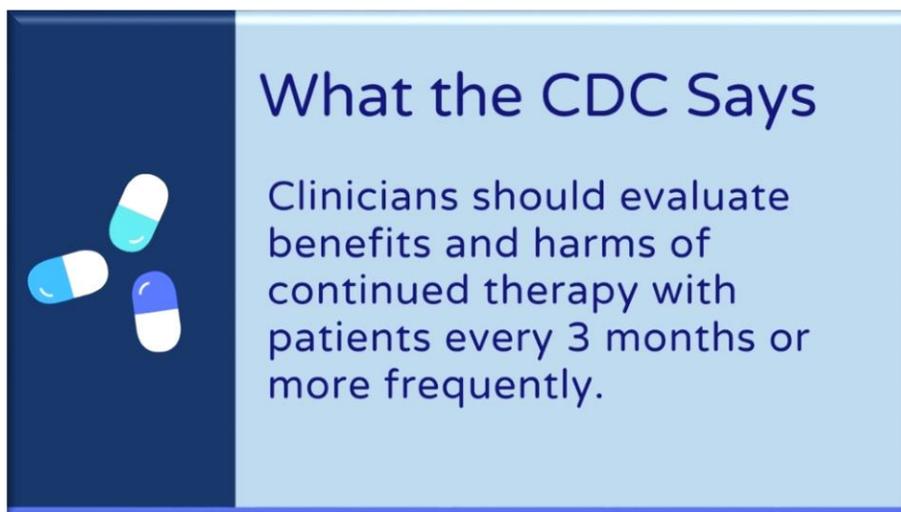
EHRs can guide physicians towards selecting opioids with short durations of therapy. Alongside technology solutions, consider supplementary physician education and re-training on opioid prescribing.

### **What You Can Do**

- Utilize default settings in order sets for dose, duration, day supply, quantity, and refills. For opioid prescriptions, make the default day supply seven days or less with no refills, and incorporate state guidelines and regulations.
- Develop reporting tools that a quality team can use to identify order sets, including customized sets, that contain large default settings for day supplies.
- Develop reporting tools that can identify physicians who routinely order long durations of opioid therapy. Monitor trends in average opioid prescription day supply by care setting, and educate physicians who prescribe longer durations than average.



## **7. Evaluate benefits and harms frequently**



### **How Technology Can Help**

EHRs can prompt physicians to consider the benefits and harms of opioid therapy at the point of ordering opioids. In addition, population health solutions, such as dashboards or registries, can monitor patients currently on opioid therapy and can make sure patients aren't falling through the cracks in terms of scheduled follow-up appointments and urine screenings.

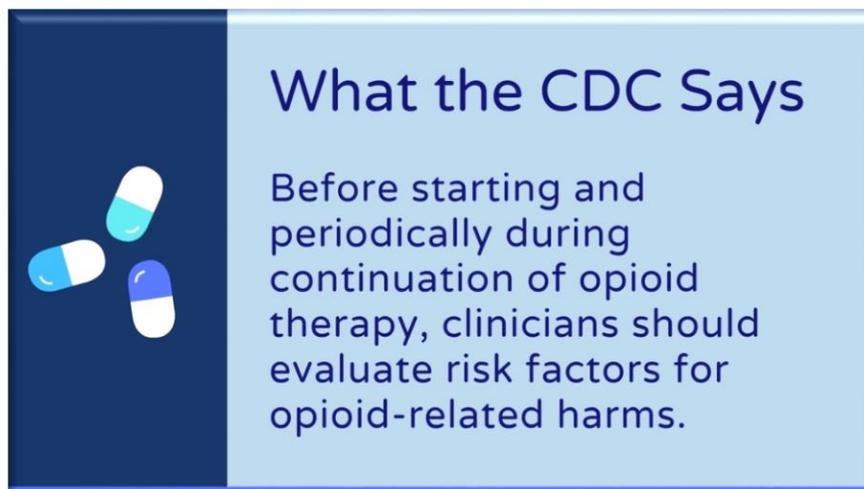
### **What You Can Do**

- Adopt advisory text in order sets that remind providers to evaluate the benefits and harms of extended use of opioid therapy.
- Make the CDC Prescribing Checklist<sup>8</sup> available to providers and encourage them to use it when renewing or continuing opioid therapy.
- Develop population health tools to monitor patients currently on opioid therapy, and ensure that patients are getting follow-up visits and screenings at regular intervals.

<sup>8</sup> CDC. *Checklist for prescribing opioids for chronic pain*. Retrieved October 2018 from [https://www.cdc.gov/drugoverdose/pdf/PDO\\_Checklist-a.pdf](https://www.cdc.gov/drugoverdose/pdf/PDO_Checklist-a.pdf).



## 8. Use strategies to mitigate risks



### How Technology Can Help

The EHR can be used to identify high-risk patient populations, and present decision support that steers physicians away from utilizing opioid therapy on these patients.

### What You Can Do

- Implement active clinical decision support, such as a drug-problem interaction check, that alerts physicians when they order opioids on a patient in a high-risk population (see *Appendix B - High Risk Conditions for Opioid-Related Harm*):
  - Patients with Sleep-Disordered Breathing, Including Sleep Apnea
  - Pregnant Women
  - Patients with Renal or Hepatic Insufficiency
  - Patients Aged  $\geq 65$  Years
  - Patients with Mental Health Conditions
  - Patients with Substance Use Disorder
  - Patients with Prior Nonfatal Overdose
- Implement an electronic screening assessment to identify patients at elevated risk for opioid misuse and diversion when selecting opioid therapy.
- Develop reporting, patient tracking, and/or population health tools to identify patients at elevated risk for harm from opioid therapy. In addition, consider using predictive models that use machine learning to identify patients who may experience opioid-related harms.
- Establish an EHR-enabled protocol for prescribing Naloxone to ensure that patients with  $\geq 50$  daily MMEs or concurrent benzodiazepines, or those with limited access to pre-hospital interventions, are co-prescribed and educated on the use of Naloxone, in order to mitigate the risk of overdose.



## 9. Review PDMP Data



### What the CDC Says

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.

### How Technology Can Help

Depending on state laws and technical requirements, many EHRs can integrate with PDMPs and display their data within clinical workflows. Technologies such as APPRISS, CRISP, LOGICOI, and others can facilitate importing PDMP data into the EHR.

### What You Can Do

- Review detailed guidance from the CDC on PDMPs.<sup>9</sup> Organizations should work with their state regulatory bodies to determine the rules, regulations, and guidance around PDMP use.
- Implement an interface to PDMP data within the EHR workflow, if available in your state.
- Educate care providers and pharmacists on the need to query the PDMP before prescribing opioids, initiating an opioid treatment agreement, and performing medication reconciliation.
- Develop documentation templates where physicians can attest to reviewing PDMPs, and record any issues or findings from PDMP data.

<sup>9</sup> CDC. *Prescription Drug Monitoring Programs*. Retrieved October 2017 from [https://www.cdc.gov/drugoverdose/pdf/PDMP\\_Factsheet-a.pdf](https://www.cdc.gov/drugoverdose/pdf/PDMP_Factsheet-a.pdf)



## 10. Use urine drug testing



### What the CDC Says

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.

### How Technology Can Help

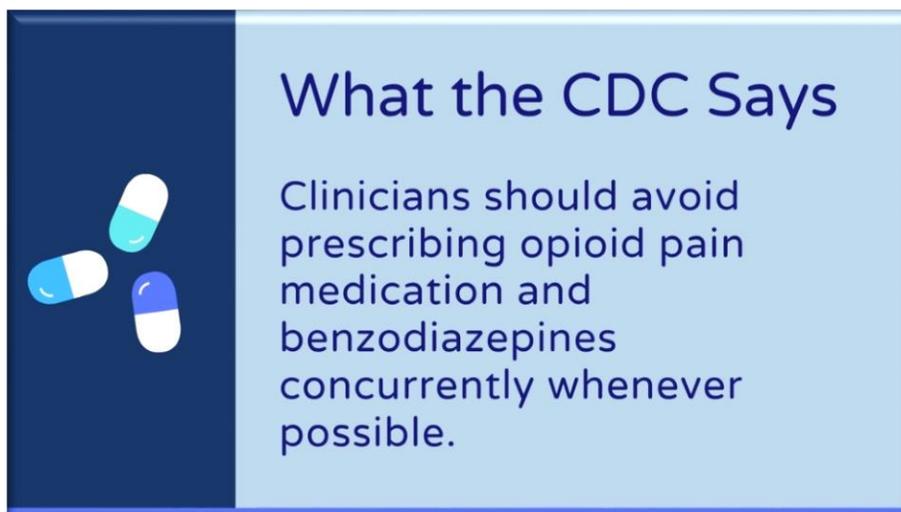
Urine drug screenings can be tracked and managed using EHR technology. Scheduling and population health tools can help ensure that screenings take place at regular intervals.

### What You Can Do

- Put a urine screening protocol in place, covering both immediate testing (e.g. quick cups) and laboratory testing (e.g. urine toxicology tests). Document test results in the EHR. Ensure that test results are visible across care settings at your organization, as well as shared interoperably with other organizations.
- Use scheduling software to book follow-up urine screenings, and use patient engagement tools to send reminders to patients when their urine screenings are near or overdue. Automatically notify physicians if patients miss multiple testing dates.
- Use population health tools to monitor patients who need multiple urine screenings.
- Implement active evidence-based clinical decision support at the point of ordering opioids if a prior urine drug screen was positive for illicit substances.



## ***11. Avoid concurrent opioid and benzodiazepine prescribing***



### **How Technology Can Help**

Physicians placing orders for opioids can make use of active clinical decision support, such as drug-drug interaction checking, to identify if benzodiazepines are currently ordered or vice-versa. Nurses and pharmacists can play an active role in monitoring PDMPs and medication lists to identify patients who are taking both benzodiazepines and opioids at the same time and assess if both drug classes are appropriate to continue.

### **What You Can Do**

- Utilize drug-drug interaction checking to warn when co-prescribing of opioids and benzodiazepines.
- Develop pharmacy or ordering reports that identify patients currently taking combinations of opioids, benzodiazepines, and/or muscle relaxants.
- Educate clinicians to check for benzodiazepines when performing medication reconciliation.



## 12. Offer treatment for opioid use disorder



### How Technology Can Help

EHR technology can help ensure that patients with opioid use disorder (OUD) are identified, treated, and/or referred to licensed specialists for treatment.

### What You Can Do

- Implement a protocol for identifying patients with OUD. This information may be captured in the EHR through the problem list, past medical history, social history, or screening tools such as the Clinical Opiate Withdrawal Scale (COWS).
- Ensure physicians have access to place referrals to physicians licensed and authorized to provide medication-assisted treatment. Provide links to a directory of these providers in an electronic format, including indicators for providers currently able to accept new patients.
- Incorporate educational materials about OUD into EHR workflows.
- Develop reporting tools that can identify and track OUD patients to ensure they are receiving adequate treatments.
- Follow a national guideline, like SAMHSA's TIP 40,<sup>10</sup> SAMHSA's TIP 63<sup>11</sup> or ASAM's 2015 National Guideline,<sup>12</sup> which includes diversion plans such as weekly office visits until the patient is stable, urine drug testing including testing for buprenorphine, recall visits for pill counts and limiting the dose to decrease the risk of street sales.

<sup>10</sup> SAMHSA (2004). *Clinical Guidelines for the Use of Buprenorphine in the Treatment of Opioid Addiction: Treatment Improvement Protocol (TIP) Series 40*. Retrieved from <http://lib.adai.washington.edu/clearinghouse/downloads/TIP-40-Clinical-Guidelines-for-the-Use-of-Buprenorphine-in-the-Treatment-of-Opioid-Addiction-54.pdf>.

<sup>11</sup> SAMHSA (2018). *Medications for Opioid Use Disorder Treatment, Improvement Protocol 63 for Healthcare and Addiction Professionals, Policymakers, Patients, and Families*. Retrieved from <https://store.samhsa.gov/system/files/sma18-5063fulldoc.pdf>.

<sup>12</sup> American Society of Addiction Medicine (2015). *National Practice Guideline for the Use of Medications in the Treatment of Addiction Involving Opioid Abuse*. Retrieved from <https://www.asam.org/docs/default-source/practice-support/guidelines-and-consensus-docs/asam-national-practice-guideline-supplement.pdf>.



## SMART on FHIR® and CDS Hooks

In addition to the technology recommendations found in this document, an additional approach to implementing the CDC guidelines is to utilize SMART on FHIR<sup>13</sup> applications.

The HHS Office of the National Coordinator for Health Information Technology (ONC) together with the Centers for Medicare and Medicaid Services (CMS), supported the development of a FHIR-based implementation guide<sup>14</sup> within its Health IT Playbook<sup>15</sup> to enable app and API developers in creating opioid-related SMART on FHIR Apps. This enables use of CDS hooks<sup>16</sup> to deliver clinical decision support at the point of ordering, with SMART apps able to complement other technology tools and provide an additional modality to operationalize evidence-based guidelines.

Additionally, the Agency for Healthcare Research and Quality (AHRQ), in partnership with the MITRE Corporation and OCHIN, developed a SMART on FHIR app<sup>17</sup> that summarizes pain-related information in a single view within the EHR, and includes visual cues to point the user to potential concerns, e.g., when current medications include both benzodiazepines and opioids.<sup>18</sup>

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<sup>13</sup> <https://smarthealthit.org/> and <http://hl7.org/fhir/>.

<sup>14</sup> ONC and CDC (2018). *Opioid Prescribing Support Implementation Guide*. Retrieved from <http://build.fhir.org/ig/cqframework/opioid-cds/>.

<sup>15</sup> *ONC Health IT Playbook*, Section 4: Opioid Epidemic & Health IT. Retrieved from <https://www.healthit.gov/playbook/opioid-epidemic-and-health-it/>.

<sup>16</sup> HL7 and Boston Children's Hospital. Retrieved from <https://cds-hooks.org/>.

<sup>17</sup> AHRQ and MITRE. Retrieved from <https://apps.smarthealthit.org/app/cds-connect>

<sup>18</sup> AHRQ Opioids and Pain Management clinical decision support artifacts. <https://cds.ahrq.gov/cdsconnect/topic/opioids-and-pain-management>



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# Conclusion

Guidance from the CDC on opioid stewardship is clinically validated but not widely adopted. The recommendations presented in this *Implementation Guide for Electronic Health Records* are designed to help hospitals, physician practices, clinicians, and the software developer community transform these important opioid prescribing guidelines from best practice statements into actionable tools that can be deployed in clinical practice.

The EHR Association encourages organizations to work with their EHR developers to discuss the implementation approaches and strategies contained in this document and put them into practice as appropriate. While some EHRs may not currently be able to implement every recommendation in this guide, organizations may ask their developers to include desired new capabilities in future updates.

With wider adoption of CDC guidance, healthcare organizations can realize safer opioid use, better opioid management, and improved opioid stewardship.



## About EHRA

Established in 2004, the Electronic Health Record Association (EHRA) brings together companies that develop, market, and support electronic health records (EHRs), to collaborate on issues that impact our businesses and our collective customers — hospitals and providers that represent the majority of EHR users in the US. We work together to speak with a unified voice on these topics in a non-competitive, collegial effort to understand, educate, and collaborate with all stakeholders engaged with EHRs and health information technology.

EHRA operates on the premise that the rapid, widespread adoption of EHRs is essential to improve the quality of patient care, as well as the productivity and sustainability of the healthcare system as a key enabler of healthcare transformation.

The EHR Association and its members are committed to supporting safe healthcare delivery, fostering continued innovation, and operating with high integrity in the market for our users and their patients and families.

For more information, please visit [www.ehra.org](http://www.ehra.org).



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## Appendix A

### Chronic Pain Concepts

*These concepts and corresponding codes are not intended to be definitive or all-inclusive. Developers should review all concepts and modify based on patient population. Codes are subject to updating and should be verified prior to use.*

ICD-10	ICD Description	SNOMED CT code	SNOMED CT Description
R52	Pain, unspecified	82423001	Chronic pain
		14150005	Alteration in comfort: chronic pain
		274665008	Chronic intractable pain
		102481003	Generalized chronic body pains
		314642004	Intermittent pain
R10.9	Unspecified abdominal pain	111985007	Chronic abdominal pain
R07.9	Chest pain, unspecified	434011000124101	Chronic chest pain
G89.29	Other chronic pain	762599007	Chronic mechanical visceral pain
		735644008	Chronic nociceptive pain
		3061000119102	Chronic nonmalignant pain
		129511000119105	Chronic pain in coccyx for more than three months
		432615008	Chronic pain in face
		133731000119108	Chronic pain in male pelvis
		16002911000119108	Chronic pain of left foot
		15743561000119103	Chronic pain of left upper limb
		16002871000119105	Chronic pain of right foot
		15743521000119108	Chronic pain of right upper limb
		136791000119103	Chronic thoracic back pain
M54.2	Cervicalgia	1121000119107	Chronic neck pain
G89.21	Chronic pain due to trauma	431481001	Chronic pain due to injury
G89.3	Neoplasm related pain (acute) (chronic)	10181000119102	Chronic pain due to malignancy
G89.28	Other chronic postprocedural pain	109771000119103	Chronic postoperative pain
R10.2	Pelvic and perineal pain	426628005	Chronic vaginal pain
		237067000	Chronic pain in female pelvis
G57.73	Causalgia of bilateral lower limbs	16058471000119101	Complex regional pain syndrome type 2 of bilateral lower limbs
G56.43	Causalgia of bilateral upper limbs	16058511000119105	Complex regional pain syndrome type 2 of bilateral upper limbs



## Appendix B

# High Risk Conditions For Opioid-Related Harms

ICD-10	ICD Description	SNOMED Code	SNOMED Description
F06.4	Anxiety disorder due to known physiological condition	52910006	Anxiety disorder due to a general medical condition
F10.180	Alcohol abuse with alcohol-induced anxiety disorder	15167005	Alcohol abuse
F10.280	Alcohol dependence with alcohol-induced anxiety disorder	66590003	Alcohol dependence
F10.980	Alcohol use, unspecified with alcohol-induced anxiety disorder	34938008	Alcohol-induced anxiety disorder
F12.180	Cannabis abuse with cannabis-induced anxiety disorder	37344009	Cannabis abuse
F12.280	Cannabis dependence with cannabis-induced anxiety disorder	85005007	Cannabis dependence
F12.980	Cannabis use, unspecified with anxiety disorder	37344009	Cannabis abuse
F13.180	Sedative, hypnotic or anxiolytic abuse with sedative, hypnotic or anxiolytic-induced anxiety disorder	64386003	Sedative abuse
F13.280	Sedative, hypnotic or anxiolytic dependence with sedative, hypnotic or anxiolytic-induced anxiety disorder	268640002	Hypnotic or anxiolytic dependence
F13.980	Sedative, hypnotic or anxiolytic use, unspecified with sedative, hypnotic or anxiolytic-induced anxiety disorder	1686006	Sedative, hypnotic AND/OR anxiolytic-induced anxiety disorder
F14.180	Cocaine abuse with cocaine-induced anxiety disorder	31956009	Cocaine dependence
F14.280	Cocaine dependence with cocaine-induced anxiety disorder	31956009	Cocaine dependence
F14.980	Cocaine use, unspecified with cocaine-induced anxiety disorder	51493001	Cocaine-induced anxiety disorder
F15.180	Other stimulant abuse with stimulant-induced anxiety disorder	441527004	Stimulant abuse
F15.280	Other stimulant dependence with stimulant-induced anxiety disorder	442406005	Stimulant dependence
F15.980	Other stimulant use, unspecified with stimulant-induced anxiety disorder	441527004	Stimulant abuse



ICD-10	ICD Description	SNOMED Code	SNOMED Description
F16.180	Hallucinogen abuse with hallucinogen-induced anxiety disorder	74851005	Hallucinogen abuse
F16.280	Hallucinogen dependence with hallucinogen-induced anxiety disorder	38247002	Hallucinogen dependence
F16.980	Hallucinogen use, unspecified with hallucinogen-induced anxiety disorder	15277004	Hallucinogen-induced anxiety disorder
F18.180	Inhalant abuse with inhalant-induced anxiety disorder	70340006	Inhalant abuse
F18.280	Inhalant dependence with inhalant-induced anxiety disorder	5002000	Inhalant dependence
F18.980	Inhalant use, unspecified with inhalant-induced anxiety disorder	20876004	Inhalant-induced anxiety disorder
F19.180	Other psychoactive substance abuse with psychoactive substance-induced anxiety disorder	91388009	Psychoactive substance abuse
F19.280	Other psychoactive substance dependence with psychoactive substance-induced anxiety disorder	2403008	Psychoactive substance dependence
F19.980	Other psychoactive substance use, unspecified with psychoactive substance-induced anxiety disorder	11061003	Psychoactive substance use disorder
F40	Phobic anxiety disorders		
F40.8	Other phobic anxiety disorders	192611004	Childhood phobic anxiety disorder
		386810004	Phobic disorder
F40.9	Phobic anxiety disorder, unspecified	198288003	Anxiety state
		386808001	Phobia
F41	Other anxiety disorders		
F41.0	Panic disorder [episodic paroxysmal anxiety]	56576003	Panic disorder without agoraphobia
		225624000	Panic attack
		79823003	Panic
F41.1	Generalized anxiety disorder	48694002	Anxiety
		198288003	Anxiety state
		21897009	Generalized anxiety disorder
		207363009	Anxiety neurosis
		197480006	Anxiety disorder
F41.3	Other mixed anxiety disorders	197480006	Anxiety disorder
F41.8	Other specified anxiety disorders	48694002	Anxiety



ICD-10	ICD Description	SNOMED Code	SNOMED Description
		231504006	Mixed anxiety and depressive disorder
		231506008	Anxiety hysteria
F41.9	Anxiety disorder, unspecified	48694002	Anxiety
		197480006	Anxiety disorder
F43.22	Adjustment disorder with anxiety	47372000	Adjustment disorder with anxious mood
F43.23	Adjustment disorder with mixed anxiety and depressed mood	47372000	Adjustment disorder with anxious mood
		57194009	Adjustment disorder with depressed mood
F93.0	Separation anxiety disorder of childhood	11806006	Separation anxiety disorder of childhood
F20	Schizophrenia		
F20.0	Paranoid schizophrenia	64905009	Paranoid schizophrenia
F20.1	Disorganized schizophrenia	35252006	Disorganized schizophrenia
F20.2	Catatonic schizophrenia	191542003	Catatonic schizophrenia
F20.3	Undifferentiated schizophrenia	111484002	Undifferentiated schizophrenia
F20.5	Residual schizophrenia	26025008	Residual schizophrenia
F20.8	Other schizophrenia		
F20.89	Other schizophrenia	58214004	Schizophrenia
		191577003	Cenesthopathic schizophrenia
		191527001	Simple schizophrenia
F20.9	Schizophrenia, unspecified	58214004	Schizophrenia
F34	Persistent mood [affective] disorders		
F34.8	Other persistent mood [affective] disorders	783530011	Mood disorder
F34.89	Other specified persistent mood disorders	737871000124117	
F29	Unspecified psychosis not due to a substance or known physiological condition	69322001	Psychotic disorder
F53	Puerperal psychosis	58703003	Postpartum depression
		18260003	Postpartum psychosis
F06.32	Mood disorder due to known physiological condition with major depressive-like episode	77486005	Mood disorder with major depressive-live episode due to general medical condition
F32	Major depressive disorder, single episode		
F32.0	Major depressive disorder, single episode, mild	79298009	Mild major depression, single episode



ICD-10	ICD Description	SNOMED Code	SNOMED Description
F32.1	Major depressive disorder, single episode, moderate	191602001	Single major depressive episode, moderate
F32.2	Major depressive disorder, single episode, severe without psychotic features	76441001	Severe major depression, single episode, without psychotic features
F32.3	Major depressive disorder, single episode, severe with psychotic features	191604000	Single major depressive episode, severe, with psychosis
		77911002	Severe major depression, single episode, with psychotic features, mood-congruent
		73867007	Severe major depression with psychotic features
		191676002	Reactive depressive psychosis
		430852001	Severe major depression, single episode, with psychotic features
		20250007	Severe major depression, single episode, with psychotic features, mood-incongruent
F32.4	Major depressive disorder, single episode, in partial remission	70747007	Major depression single episode, in partial remission
F32.5	Major depressive disorder, single episode, in full remission	191606003	Single major depressive episode, in full remission
F32.9	Major depressive disorder, single episode, unspecified	36923009	Major depression, single episode
		35489007	Depressive disorder
F33	Major depressive disorder, recurrent		
F33.0	Major depressive disorder, recurrent, mild	40379007	Mild recurrent major depression
F33.1	Major depressive disorder, recurrent, moderate	18818009	Moderate recurrent major depression
F33.2	Major depressive disorder, recurrent severe without psychotic features	36474008	Severe recurrent major depression without psychotic features
F33.3	Major depressive disorder, recurrent, severe with psychotic symptoms	28475009	Severe recurrent major depression with psychotic features
		73867007	Severe major depression with psychotic features
		191613003	Recurrent major depressive episodes, severe, with psychosis



ICD-10	ICD Description	SNOMED Code	SNOMED Description
F33.4	Major depressive disorder, recurrent, in remission		
F33.40	Major depressive disorder, recurrent, in remission, unspecified	68019004	Recurrent major depression in remission
F33.41	Major depressive disorder, recurrent, in partial remission	33135002	Recurrent major depression in partial remission
F33.42	Major depressive disorder, recurrent, in full remission	46244001	Recurrent major depression in complete remission
F33.9	Major depressive disorder, recurrent, unspecified	66344007	Recurrent major depression
		35489007	Depressive disorder



## Renal Insufficiency

ICD-10	ICD Description	SNOMED code	SNOMED CT name
N28.9	Disorder of kidney and ureter, unspecified	90708001	Kidney disease
		236406007	Acquired immune deficiency syndrome-related nephropathy
		58574008	Acute nephropathy
		236424009	Acute renal impairment
		735475005	Renal hypocalciuria
		707756004	Gitelman syndrome
		236423003	Renal impairment
		723188008	Renal insufficiency
		236592000	Stenosis of calyceal neck
		236437007	Structural and functional abnormalities of the kidney
		236483001	Escape of urine from kidney
		431581000124100	Disease of renal parenchyma
		713504001	Disorder of kidney co-occurrent with human immunodeficiency virus infection
		449408005	Disorder of kidney due to kappa light chain disease
		720519003	Atherosclerosis, deafness, diabetes, epilepsy, nephropathy syndrome
		197663003	Impaired renal function disorder
		197671004	Renal function impairment with growth failure
		363224005	Neonatal renal disorder
		276583007	Newborn renal dysfunction
		736993008	Nephropathy following eclampsia
736992003	Nephropathy following pre-eclampsia		
363286005	Renal complication of procedure		
236526008	Renal disorders in inherited disease		
N19	Unspecified kidney failure	112066009	Absent renal function
		155876003	Non-functioning kidney
		363287001	Renal failure associated with renal vascular disease
		42399005	Renal failure syndrome
		44730006	Uremia



ICD-10	ICD Description	SNOMED code	SNOMED CT name
		445120004	Uremia due to inadequate renal perfusion
		310647000	Anemia secondary to renal failure
		713696000	Renal failure syndrome co-occurrent with human immunodeficiency virus infection
		721840000	Hyperuricemia, anemia, renal failure syndrome
R74.8	Abnormal levels of other serum enzymes	102803006	Absence of renin secretion
N00.9	Acute nephritic syndrome with unspecified morphologic changes	57965003	Acute benign hemorrhagic glomerulonephritic syndrome
		61503006	Acute nephritis
N17.9	Acute kidney failure, unspecified	14350001000004108	Acute injury of kidney
		733137002	Acute kidney failure stage 1
		733138007	Acute kidney failure stage 2
		733139004	Acute kidney failure stage 3
		129561000119108	Pre-renal acute kidney injury
		368951000119105	Acute renal failure caused by contrast agent
		722096006	Acute kidney injury due to hypovolemia
N17.1	Acute kidney failure with acute cortical necrosis	444794000	Acute necrosis of cortex of kidney
		444691002	Necrosis of cortex of kidney
N/A		194909006	Acute pericarditis co-occurrent and due to uremia
N99.0	Postprocedural (acute) (chronic) kidney failure	438783006	Acute postoperative renal failure
		36225005	Acute renal failure due to procedure
N10	Acute pyelonephritis	32801008	Acute pyelitis
		36689008	Acute pyelonephritis
N17.2	Acute kidney failure with medullary necrosis	197769007	Acute pyelonephritis with medullary necrosis
		722077007	Renal papillary necrosis caused by analgesic drug
		90241004	Papillary necrosis
		270494003	Acute papillary necrosis



ICD-10	ICD Description	SNOMED code	SNOMED CT name
		14343001	Acute pyelitis with renal medullary necrosis
		236438002	Calcific papillary necrosis
		723074006	Renal papillary necrosis due to diabetes mellitus
		722085003	Renal papillary necrosis due to sickle cell disease
N13.6	Pyonephrosis	197770008	Acute pyonephrosis
		48631008	Pyonephrosis
T86.11	Kidney transplant rejection	236574008	Acute rejection of renal transplant
		236582008	Acute-on-chronic rejection of renal transplant
		236570004	Renal transplant rejection
N28.89	Other specified disorders of kidney and ureter	236496000	Acute urate nephropathy
		370493008	Renal medullary washout
		432294000	Dysplasia of blood vessel of kidney
		197812000	Renal artery hemorrhage
		91003006	Salt-losing nephropathy
		95582003	Kidney crystallization
		197817006	Adhesions of kidney
		371011007	Caliectasis
		423919000	Acquired caliectasis
		236484007	Calyceal fistula
		93425004	Discoloration of kidney
		433036004	Diverticulum of renal calyx
		298127003	
		253876004	Fibrocystic renal degeneration
		236485008	Fistula from renal pelvis
		431501001	Pyelocutaneous fistula
		95571006	Hemorrhage of kidney
		262891006	Hematoma of kidney
		236369004	Renal acidemia
		722095005	Acute kidney injury due to circulatory failure
		236459009	Malakoplakia of kidney
		236495001	Urate nephropathy
236527004	Nail patella-like renal disease		
433229006	Nephrocutaneous fistula		



ICD-10	ICD Description	SNOMED code	SNOMED CT name
		431480000	Nephrovisceral fistula
		405573009	Acquired obstructive defect of renal pelvis
N18.9	Chronic kidney disease, unspecified	236433006	Acute-on-chronic renal failure
		709044004	Chronic kidney disease
		707148007	Recurrent post-transplant renal disease
		193003	Benign hypertensive renal disease
A98.5	Hemorrhagic fever with renal syndrome	716864001	Hemorrhagic fever with renal syndrome
		102455002	Hemorrhagic nephroso-nephritis
O90.4	Postpartum acute kidney failure	733839001	Postpartum acute renal failure
N25.89	Other disorders resulting from impaired renal tubular function	276586004	Transient neonatal renal tubular acidosis
		1776003	Renal tubular acidosis
		236461000	Distal renal tubular acidosis
		236463002	Hyperkalemic renal tubular acidosis
		24790002	Proximal renal tubular acidosis
		236469003	Fanconi-like syndrome
		236479001	Magnesium-losing nephropathy
		83850008	Acidosis co-occurrent and due to uremia
		33763006	Hypercalcemic nephropathy
		54879000	Hypokalemic nephropathy
		370494002	Protein-losing nephropathy
236532003	Renal tubular acidosis with progressive nerve deafness		
N25.9	Disorder resulting from impaired renal tubular function, unspecified	700448000	Epilepsy, ataxia, sensorineural deafness, and tubulopathy syndrome
		236470002	Specific renal tubule transport defect
		724062000	Proximal tubulopathy, diabetes mellitus, cerebellar ataxia syndrome
I13.10	Hypertensive heart and chronic kidney disease without heart failure, with stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease	445236007	Cardiorenal syndrome
		86234004	Hypertensive heart AND renal disease



ICD-10	ICD Description	SNOMED code	SNOMED CT name
Q63.9	Congenital malformation of kidney, unspecified	733097003	Ichthyosis, intellectual disability, dwarfism, renal impairment syndrome
		44513007	Congenital anomaly of the kidney
		720414005	Acrorenal mandibular syndrome
		720458005	Acrorenal syndrome
		720415006	Acrorenoocular syndrome
		5397007	Congenital anomaly of renal pelvis
		716094008	Fibulo-ulnar hypoplasia and renal anomalies syndrome
		725908007	Neurofaciodigitorenal syndrome
		723720008	Sex reversion, kidney, adrenal and lung dysgenesis syndrome
		723333000	Faciocardiorenal syndrome
		723363009	Hypotrichosis, lymphedema, telangiectasia, renal defect syndrome
		721862000	Joubert syndrome with oculorenal defect
N15.9	Renal tubulo-interstitial disease, unspecified	713453003	Renal impairment caused by Polyomavirus
		762464006	Autosomal dominant tubulointerstitial disease
		719839000	Tubular renal disease with cardiomyopathy syndrome
		111404004	Perinephritis
		78815005	Hereditary tubulointerstitial disorder
		129128006	Infectious disorder of kidney
		713886006	Nephropathy caused by BK polyomavirus
N25.0	Renal osteodystrophy	81986001	Renal secondary osteodystrophia fibrosa
		197664009	Phosphate-losing tubular disorders
177.0	Arteriovenous fistula, acquired	275510005	Acquired renal arteriovenous aneurysm
		282348002	Acquired renal arteriovenous fistula
172.2	Aneurysm of renal artery	36184004	Aneurysm of renal artery
112.9	Hypertensive chronic kidney disease with	16147005	Arteriolar nephritis
		32916005	Nephrosclerosis



ICD-10	ICD Description	SNOMED code	SNOMED CT name
	stage 1 through stage 4 chronic kidney disease, or unspecified chronic kidney disease	78544004	Chronic hypertensive uremia
		38481006	Hypertensive renal disease
		104931000119100	Chronic kidney disease due to hypertension
		473392002	Hypertensive nephrosclerosis
		73030000	Hypertensive renal disease in obstetric context
		65443008	Malignant hypertensive renal disease
		14973001	Renal sclerosis with hypertension
I70.1	Atherosclerosis of renal artery	431431000124100	Arteriosclerosis of renal artery
		45281005	Atherosclerosis of renal artery
		302233006	Renal artery stenosis
N03.4	Chronic nephritic syndrome with diffuse endocapillary proliferative glomerulonephritis	197712008	Chronic nephritic syndrome, diffuse endocapillary proliferative glomerulonephritis
I82.3	Embolism and thrombosis of renal vein	39291006	Embolism of renal vein
		15842009	Thrombosis of renal vein
I77.89	Other specified disorders of arteries and arterioles	2900003	Hyperplasia of renal artery
		95578000	Renal vasculitis
N05.8	Unspecified nephritic syndrome with other morphologic changes	721191000	Necrosis of capillary of kidney due to glomerular disease
		1426004	Necrotizing glomerulonephritis
		73305009	Fibrillary glomerulonephritis
N28.0	Ischemia and infarction of kidney	95580006	Renal artery embolism
		236488005	Renal artery occlusion
		45456005	Renal infarction
		95579008	Thrombosis of renal artery
		735474009	Ischemia of kidney
		733342000	Ischemic contracture of kidney
		710565001	Nephropathy due to ischemia
		423533009	Acute renal failure due to ischemia
N/A		210811000	Renal blood vessel injury
N08	Glomerular disorders in diseases classified elsewhere	13886001	Sickle cell nephropathy
		236505008	Cryoglobulinemic glomerulonephritis
		446923008	Lipoprotein glomerulopathy
		236504007	Henoch-Schönlein nephritis



ICD-10	ICD Description	SNOMED code	SNOMED CT name
N/A		460375006	Systemic to pulmonary collateral artery from left renal artery
N/A		460365008	Systemic to pulmonary collateral artery from right renal artery
N/A		30124006	Rupture of kidney
N/A		210207004	Complete disruption of kidney parenchyma with open wound into cavity
N/A		736451003	Partial rupture of ureteropelvic junction
N/A		262894003	Rupture of renal pelvis
N28.1	Cyst of kidney, acquired	22470001000004107	Ruptured cyst of kidney
		722223000	Cyst of kidney
		105999006	Acquired renal cystic disease
		18300001000004102	Complex cyst of kidney
		735471001	Complex renal cyst
		187144000	Hydatid cyst of kidney
		77945009	Simple renal cyst
		236376009	Infected renal cyst
N/A		405584002	Traumatic rupture of kidney
N27.9	Small kidney, unspecified	236448000	Small kidney
		709978007	Contracted kidney
		359563005	Small kidney of unknown cause
		765156001	Small left kidney
		765157005	Small right kidney
Q60.5	Renal hypoplasia, unspecified	61852001	Ask-Upmark kidney
		32659003	Congenital hypoplasia of kidney
		446449009	Renal coloboma syndrome
		204941003	Congenital renal atrophy
		702397002	Renal tubular dysgenesis
N26.1	Atrophy of kidney (terminal)	197659005	Atrophy of kidney
Q62.11	Congenital occlusion of ureteropelvic junction	36388008	Stricture of pelviureteric junction
		373584008	Congenital pelviureteric junction obstruction
Q61.9	Cystic kidney disease, unspecified	236439005	Cystic disease of kidney
		723409007	Multinodular goiter, cystic kidney, polydactyly syndrome
N17.0	Acute kidney failure	76224000	Hemoglobinuric nephrosis



ICD-10	ICD Description	SNOMED code	SNOMED CT name
	with tubular necrosis	67132008	Hypoxic nephrosis
N29	Other disorders of kidney and ureter in diseases classified elsewhere	48638002	Nephrocalcinosis
		449409002	Disorder of kidney due to lambda light chain disease
		109477002	Enamel-renal syndrome
		725033008	Familial primary hypomagnesemia with hypercalciuria and nephrocalcinosis without severe ocular involvement
		106000008	Metabolic renal disease
		276584001	Neonatal nephrocalcinosis
		236498004	Renal disorders in systemic disease
		236507000	Renal involvement in malignant disease
		236502006	Renal involvement in scleroderma
N26.9	Renal sclerosis, unspecified	95577005	Renal interstitial fibrosis
		722139003	Focal segmental glomerulosclerosis caused by lithium
		713887002	Focal segmental glomerulosclerosis co-occurrent with human immunodeficiency virus infection
		236402009	Glomerulopathy due to ischemia
		236528009	Diffuse mesangial sclerosis with ocular abnormalities
N14.4	Toxic nephropathy, not elsewhere classified	236514003	Toxic nephropathy
		236515002	Acute toxic nephropathy
		236523000	Chronic toxic interstitial nephritis
		236428007	Nephrotoxic acute renal failure
		123753008	Nephrotoxic serum nephritis
		69718008	Oxalate nephropathy
		236430009	Pigment nephropathy
		717770008	Aristolochic acid nephropathy
N/A		269257004	Acute renal failure due to crush syndrome
N14.2	Nephropathy induced by unspecified drug, medicament or biological substance	236519008	Chronic drug-induced renal disease
		439990003	Drug-induced interstitial nephritis
		722120008	Membranous glomerulonephritis caused by drug
		762531008	Renal hypersensitivity caused by drug



ICD-10	ICD Description	SNOMED code	SNOMED CT name
N25.1	Nephrogenic diabetes insipidus	118951003	Drug-induced nephrogenic diabetes insipidus
		61165007	Hereditary nephrogenic diabetes insipidus
N14.1	Nephropathy induced by other drugs, medicaments and biological substances	704206001	Nephropathy caused by aminoglycoside
		704055002	Nephropathy caused by amphotericin
		704203009	Nephropathy caused by ciclosporin
		197753000	Nephropathy caused by heavy metals
		428720002	Nephropathy caused by heroin
		704205002	Nephropathy caused by tacrolimus
		26367008	Radiographic contrast agent nephropathy
E83.19	Other disorders of iron metabolism	83563007	Renal hemosiderosis
G63	Polyneuropathy in diseases classified elsewhere	11659006	Uremic neuropathy
B58.83	Toxoplasma tubulo-interstitial nephropathy	1092831000119109	Toxoplasma tubulointerstitial nephropathy
P96.0	Congenital renal failure	276627004	Congenital uremia
		268854008	Congenital renal failure
R39.2	Extrarenal uremia	367481000119108	Extrarenal uremia
O07.32	Renal failure following failed attempted termination of pregnancy	1592005	Failed attempted abortion with uremia
O04.82	Renal failure following (induced) termination of pregnancy	609490001	Induced termination of pregnancy complicated by uremia
		609452007	Induced termination of pregnancy complicated by renal failure
N/A		80119007	Pericarditis co-occurrent and due to uremia
O08.4	Renal failure following ectopic and molar pregnancy	28196006	Uremia following molar AND/OR ectopic pregnancy
O26.839	Pregnancy related renal disease, unspecified trimester	237230004	Uremia in pregnancy without hypertension
		75150001	Renal disease in pregnancy AND/OR puerperium without hypertension



ICD-10	ICD Description	SNOMED code	SNOMED CT name
N/A		77624000	Volume excess, primary renal sodium retention
N/A		48713002	Amyloid nephropathy
N/A		425879009	Amyloid A nephropathy
N/A		426598005	Amyloid light-chain nephropathy
N/A		15123008	Familial amyloid nephropathy with urticaria AND deafness
N/A		66451004	Familial visceral amyloidosis, Ostertag type
D63.1	Anemia in chronic kidney disease	234348004	Anemia of renal disease
		204984002	Fusion of kidneys
N18.3	Chronic kidney disease, stage 3 (moderate)	691421000119108	Anemia co-occurrent and due to chronic kidney disease stage 3
Q63.8	Other specified congenital malformations of kidney	85901000	Megacalycosis
		253872002	Bifid kidney
		92921005	Congenital abnormal shape of kidney
		48061001	Congenital calculus of kidney
		253875000	Congenital calyceal diverticulum
		278531007	Congenital hydrocalicosis
		725905005	Infundibulopelvic stenosis multicystic kidney syndrome
		88102009	Nodular renal blastema
		111631000119106	Congenital pyelectasia
430035004	Fetal pyelectasis		
T86.10	Unspecified complication of kidney transplant	58797008	Complication of transplanted kidney
T86.19	Other complication of kidney transplant	426136000	Delayed renal graft function
		236584009	Perfusion injury of renal transplant
		236614007	Perirenal and periureteric post-transplant lymphocele
		277011002	Pre-existing disease in renal transplant
		236569000	Primary non-function of renal transplant
		713825007	Renal artery stenosis of transplanted kidney
		236587002	Transplant glomerulopathy



ICD-10	ICD Description	SNOMED code	SNOMED CT name
		277010001	Unexplained episode of renal transplant dysfunction
T86.12	Kidney transplant failure	236583003	Failed renal transplant
N/A		62771000119104	Congenital anomaly of fetal kidney
Q63.0	Accessory kidney	30275001	Accessory kidney
		54967001	Double kidney
		270517006	Triple kidney with triple pelvis
Q60.2	Renal agenesis, unspecified	92975004	Congenital absence of renal papilla
		722431007	Double uterus, hemivagina, renal agenesis syndrome
		204942005	Renal agenesis
		204938007	Renal agenesis and dysgenesis
		733116005	Aniridia, renal agenesis, psychomotor retardation syndrome
Q63.3	Hyperplastic and giant kidney	271387005	Congenital enlarged kidney
		55856005	Congenital hyperplasia of kidney
		204985001	Hyperplasia of kidney
		4495005	Congenital hypertrophy of ureteric valve
Q62.0	Congenital hydronephrosis	16297002	Congenital hydronephrosis
Q63.1	Lobulated, fused and horseshoe kidney	13530005	Congenital lobulation of kidney
Q63.2	Ectopic kidney	55536001	Congenital malposition of kidney
		16507009	Ectopic kidney
Q61.19	Other polycystic kidney, infantile type	28770003	Polycystic kidney disease, infantile type
N/A		766765009	Radio-renal syndrome
Q61.4	Renal dysplasia	204949001	Renal dysplasia
		719840003	Renal dysplasia with limb defect syndrome
		723555007	Thymic, renal, anal, lung dysplasia syndrome
		236531005	Renal dysplasia and retinal aplasia
		710571007	Renal dysplasia due to fetal exposure to angiotensin converting enzyme inhibitor
Q61.00	Congenital renal cyst, unspecified	369071000119105	Congenital renal cyst



ICD-10	ICD Description	SNOMED code	SNOMED CT name
Q61.02	Congenital multiple renal cysts	253883006	Multiple renal cysts
N/A		707530009	Cystic hamartoma of lung and kidney
N04.9	Nephrotic syndrome with unspecified morphologic changes	713695001	Nephrotic syndrome co-occurrent with human immunodeficiency virus infection
		48796009	Congenital nephrotic syndrome
		718141008	Familial idiopathic steroid-resistant nephrotic syndrome
		74011000119107	Renal anasarca
		197606008	Nephrotic syndrome in malaria
		236530006	Pulmonic stenosis and congenital nephrosis
N/A		262900003	Disruption of pelviureteric junction
N/A		262612001	Foreign body in kidney
N07.9	Hereditary nephropathy, not elsewhere classified with unspecified morphologic lesions	367591000119105	Hereditary nephropathy
		703310005	Autosomal dominant progressive nephropathy with hypertension
		722381004	Congenital cataract, nephropathy, encephalopathy syndrome
		444645005	Dent's disease
		399340005	Hereditary nephritis
		724282009	Hypoparathyroidism, deafness, renal disease syndrome
		716999001	Joubert syndrome with renal defect
		723440000	Nephrogenic syndrome of inappropriate antidiuresis
		733089005	Spastic paraplegia, nephritis, deafness syndrome
399190000	Non-progressive hereditary glomerulonephritis		
Q61.2	Polycystic kidney, adult type	765330003	Autosomal dominant polycystic kidney disease
Q61.5	Medullary cystic kidney	726018006	Autosomal dominant tubulointerstitial kidney disease
		723999009	Retinitis pigmentosa, hypopituitarism, nephronophthisis, skeletal dysplasia syndrome
E26.81	Bartter's syndrome	717791000	Bartter syndrome type 4a



ICD-10	ICD Description	SNOMED code	SNOMED CT name
N/A		81896006	Dysmorphic sialidosis with renal involvement
E75.21	Fabry (-Anderson) disease	16652001	Fabry's disease
K76.7	Hepatorenal syndrome	62216007	Familial arthrogyrosis-cholestatic hepatorenal syndrome
		42927005	Cholemic nephrosis
N/A		81987005	Familial hypokalemic alkalosis, Gullner type
D49.519	Neoplasm of unspecified behavior of unspecified kidney	716657000	Familial papillary thyroid carcinoma with renal papillary neoplasia syndrome
		126880001	Neoplasm of kidney
		126881002	Neoplasm of renal pelvis
		254914004	Tumor of kidney parenchyma
		254924007	Tumor of renal calyx
C64.9	Malignant neoplasm of unspecified kidney, except renal pelvis	717736007	Familial renal cell carcinoma
		302849000	Nephroblastoma
		363518003	Malignant tumor of kidney
N/A		75652008	Familial renal iminoglycinuria
N07.6	Hereditary nephropathy, not elsewhere classified with dense deposit disease	722759007	Glomerulopathy with fibronectin deposits 2
N/A		61598006	Glycogenosis with glucoaminophosphaturia
N/A		764961009	Hereditary clear cell renal cell carcinoma
N07.7	Hereditary nephropathy, not elsewhere classified with diffuse crescentic glomerulonephritis	367521000119108	Hereditary diffuse crescentic glomerulonephritis
E72.04	Cystinosis	62332007	Infantile nephropathic cystinosis
Q61.3	Polycystic kidney, unspecified	724094005	Neonatal diabetes, congenital hypothyroidism, congenital glaucoma, hepatic fibrosis, polycystic kidney syndrome
N/A		763891005	Renal hepatic pancreatic dysplasia



ICD-10	ICD Description	SNOMED code	SNOMED CT name
N07.8	Hereditary nephropathy, not elsewhere classified with other morphologic lesions	733096007	Thyrocerebrorenal syndrome
		236535001	Glomerulopathy with giant fibrillar deposits
N26.2	Page kidney	367821000119106	Hypertension due to compression of renal parenchyma
I12.0	Hypertensive chronic kidney disease with stage 5 chronic kidney disease or end stage renal disease	49220004	Hypertensive renal failure
O10.219	Pre-existing hypertensive chronic kidney disease complicating pregnancy, unspecified trimester	198949009	Renal hypertension complicating pregnancy, childbirth and the puerperium
O10.22	Pre-existing hypertensive chronic kidney disease complicating childbirth		
O10.23	Pre-existing hypertensive chronic kidney disease complicating the puerperium		
N28.81	Hypertrophy of kidney	88531004	Hypertrophy of kidney
		302922004	Compensatory hypertrophy of single kidney
N/A		765155002	Hypertrophy of left kidney co-occurrent and due to congenital hypoplasia of right kidney
N/A		765154003	Hypertrophy of right kidney co-occurrent and due to congenital hypoplasia of left kidney
N05.9	Unspecified nephritic syndrome with unspecified morphologic changes	42231000009109	Bacterial nephritis
N20.9	Urinary calculus, unspecified	23754003	Calculous pyelonephritis
N11.8	Other chronic tubulo-	236374007	Chronic infective interstitial nephritis



ICD-10	ICD Description	SNOMED code	SNOMED CT name
	interstitial nephritis	89637003	Pyelitis glandularis
N11.9	Chronic tubulo-interstitial nephritis, unspecified	63302006	Chronic pyelonephritis
		197762003	Chronic pyelitis
N15.8	Other specified renal tubulo-interstitial diseases	236377000	Fungal infection of kidney
O23.00	Infections of kidney in pregnancy, unspecified trimester	199110003	Infections of kidney in pregnancy
N11.1	Chronic obstructive pyelonephritis	4181000119109	Obstructive pyelonephritis
N16	Renal tubulo-interstitial disorders in diseases classified elsewhere	197782004	Pyelonephritis associated with another disorder
		197783009	Pyelitis associated with another disorder
		363288006	Renal tubulo-interstitial disorders in systemic disease
A52.75	Syphilis of kidney and ureter	59530001	Syphilis of kidney
A18.11	Tuberculosis of kidney and ureter	44323002	Tuberculosis of kidney
		37133005	Tuberculous pyelitis
N/A		40095003	Injury of kidney
N/A		283905005	Avulsion of kidney
N/A		210197003	Closed injury of kidney
N/A		70092007	Contusion of kidney
N/A		61474001	Injury of kidney with open wound into abdominal cavity
N/A		20341008	Injury of kidney without open wound into abdominal cavity
N/A		240317003	Kidney injury due to birth trauma
N/A		262893009	Laceration of kidney
N/A		210203000	Open injury of kidney
N/A		736450002	Partial traumatic rupture of ureteropelvic junction
Z90.5	Acquired absence of kidney	722466009	Traumatic loss of kidney
N06.9	Isolated proteinuria with unspecified morphologic lesion	230970001	Isolated non-nephrotic proteinuria



ICD-10	ICD Description	SNOMED code	SNOMED CT name
N20.0	Calculus of kidney	95570007	Kidney stone
		427649000	Calcium renal calculus
		236710009	Calculus in renal pelvis
		266556005	Calculus of kidney and ureter
		236708007	Calyceal renal calculus
		699322002	Matrix stone of kidney
		168041003	On examination - renal calculus
		274401005	Uric acid renal calculus
		236713006	X-linked recessive nephrolithiasis with renal failure
N/A		111403005	Lipomatosis renis
E72.03	Lowe's syndrome	79385002	Lowe syndrome
N03.9	Chronic nephritic syndrome with unspecified morphologic changes	367051000119105	Morphologic change of kidney due to chronic nephritic syndrome
O07.32	Renal failure following failed attempted termination of pregnancy	77186001	Failed attempted abortion with renal tubular necrosis
M31.30	Wegener's granulomatosis without renal involvement	195353004	Granulomatosis with polyangiitis
N01.7	Rapidly progressive nephritic syndrome with diffuse crescentic glomerulonephritis	239932005	Primary pauci-immune necrotizing and crescentic glomerulonephritis
D30.00	Benign neoplasm of unspecified kidney	92165001	Benign neoplasm of kidney
D09.19	Carcinoma in situ of other urinary organs	92624000	Carcinoma in situ of kidney
		126874009	Neoplasm of perirenal tissue
D41.00	Neoplasm of uncertain behavior of unspecified kidney	94889006	Neoplasm of uncertain behavior of kidney
N13.9	Obstructive and reflux uropathy, unspecified	698757009	Nephropathy due to acquired urinary tract obstruction
E13.21	Other specified diabetes mellitus with diabetic nephropathy	126551000119103	Nephropathy due to secondary diabetes mellitus



ICD-10	ICD Description	SNOMED code	SNOMED CT name
M32.14	Glomerular disease in systemic lupus erythematosus	295121000119101	Nephrosis co-occurrent and due to systemic lupus erythematosus
		295101000119105	Nephropathy co-occurrent and due to systemic lupus erythematosus
		295111000119108	Nephrotic syndrome co-occurrent and due to systemic lupus erythematosus
		68815009	Systemic lupus erythematosus glomerulonephritis syndrome
N13.8	Other obstructive and reflux uropathy	86249007	Obstructive nephropathy
		722082000	Obstructive nephropathy due to benign prostatic hyperplasia
		722088001	Obstructive nephropathy due to malignancy
		722078002	Obstructive nephropathy due to neurogenic bladder
Q62.39	Other obstructive defects of renal pelvis and ureter	253886003	Congenital obstructive defect of renal pelvis
N13.30	Unspecified hydronephrosis	43064006	Hydronephrosis
N13.5	Crossing vessel and stricture of ureter without hydronephrosis	95575002	Obstruction of pelviureteric junction
N13.39	Other hydronephrosis	197820003	Pyelectasia
N12	Tubulo-interstitial nephritis, not specified as acute or chronic	27174002	Pyelitis
N28.85	Pyeloureteritis cystica	37779008	Pyeloureteritis cystica
N15.1	Renal and perinephric abscess	3321001	Renal abscess
		197772000	Renal and perinephric abscess
B52.0	Plasmodium malariae malaria with nephropathy	186796004	Plasmodium malariae malaria with nephropathy
K91.83	Postprocedural hepatorenal syndrome	31005002	Hepatorenal syndrome due to a procedure
		34165000	Gestational proteinuria



ICD-10	ICD Description	SNOMED code	SNOMED CT name
N07.5	Hereditary nephropathy, not elsewhere classified with diffuse mesangiocapillary glomerulonephritis	236534002	Familial lobular glomerulopathy



## Hepatic insufficiency

ICD-10	ICD Description	SNOMED Code	SNOMED Description
K72.90	Hepatic failure, unspecified without coma	59927004	Hepatic failure
		798823012	Hepatic failure (disorder)
		99549014	Hepatic failure
		99554017	Hepatic insufficiency
		99556015	Liver decompensation
		498583014	Liver failure
		99555016	Liver function failure
		708248004	End stage liver disease
		3033334016	End stage liver disease (disorder)
		3033652011	End stage liver disease
		235884008	Fulminant hepatic failure
		24402012	Fulminant hepatic failure (disorder)
		353598017	Fulminant hepatic failure
		353599013	FHF - Fulminant hepatic failure
K72.00	Acute and subacute hepatic failure without coma	197270009	Acute hepatic failure
		581624010	Acute hepatic failure (disorder)
		303381014	Acute hepatic failure
		197275004	Subacute hepatic failure
		581630010	Subacute hepatic failure (disorder)
		303388015	Subacute hepatic failure
		303380010	ALF - Acute liver failure
		303379012	Acute liver failure
		235885009	Subfulminant hepatic failure
		624403019	Subfulminant hepatic failure (disorder)
353600011	Subfulminant hepatic failure		
B17.9*	Acute viral hepatitis, unspecified	722864002	Acute hepatic failure caused by hepatitis virus
		722865001	Subacute hepatic failure caused by hepatitis virus
K71.10	Toxic liver disease with hepatic necrosis, without coma	413438002	Acute hepatic failure due to drugs
K72.10	Chronic hepatic failure without coma	235886005	Chronic hepatic failure
		624404013	Chronic hepatic failure (disorder)
		353601010	Chronic hepatic failure
K74.60	Unspecified cirrhosis of liver	716203000	Decompensated cirrhosis of liver
		3305077011	Decompensated cirrhosis of liver
		3305078018	Decompensated cirrhosis
K91.82		22508003	Hepatic failure due to a procedure



ICD-10	ICD Description	SNOMED Code	SNOMED Description
	Postprocedural hepatic failure	751924015	Hepatic failure due to a procedure (disorder)
		37784018	Hepatic failure due to a procedure
		3023101015	Postprocedural hepatic failure
K91.83	Postprocedural hepatorenal syndrome	31005002	Hepatorenal syndrome due to a procedure
		213231008	Hepatorenal syndrome as a complication of care
		31005002	Hepatorenal syndrome due to a procedure
K76.7	Hepatorenal syndrome	51292008	Hepatorenal syndrome
		789175012	Hepatorenal syndrome (disorder)
		85441018	Hepatorenal syndrome
		495985014	HRF - Hepatorenal failure
		495986010	Hepatorenal failure
O90.4	Postpartum acute kidney failure	22846003	Hepatorenal syndrome following delivery
∅		720461006	Acute infantile liver failure due to synthesis defect of mitochondrial deoxyribonucleic acid encoded protein
∅		213230009	Hepatic failure as a complication of care
∅		599149013	Hepatic failure as a complication of care (disorder)
∅		325080013	Hepatic failure as a complication of care
∅		325079010	Liver failure as a complication of care
∅		62216007	Familial arthrogyrosis-cholestatic hepatorenal syndrome



## Sleep apnea and sleep-disordered breathing

ICD-10	ICD Description	SNOMED CT concept code	SNOMED CT concept name
G47.30	Sleep apnea, unspecified	111489007	Breathing-related sleep disorder
G47.39	Other sleep apnea	24825006	Central alveolar hypoventilation syndrome
		105191000119100	Acquired central alveolar hypoventilation
		230493001	Mixed sleep apnea
		430390000	Sleep-related neurogenic tachypnea
G47.35	Congenital central alveolar hypoventilation syndrome	399040002	Congenital central hypoventilation
		719972004	Haddad syndrome
G47.34	Idiopathic sleep related nonobstructive alveolar hypoventilation	441910000	Idiopathic sleep related non-obstructive alveolar hypoventilation
G47.36	Sleep related hypoventilation in conditions classified elsewhere	441910000	Late-onset central hypoventilation co-occurrent and due to hypothalamic dysfunction
		89911000119102	Sleep related hypoventilation or hypoxemia
		443760008	Sleep hypoventilation
		429456008	Hypoventilation during sleep due to neuromuscular disorder
		426542005	Sleep hypoventilation due to lower airway obstruction
		724509002	Sleep-related hypoventilation caused by substance
		288581000119102	Sleep related hypoxemia