

## PRESCRIBING INFORMATION

### ® **MEPERIDINE HYDROCHLORIDE INJECTION USP**

Solution for Injection: 50 mg/mL

After Dilution: Subcutaneous, Intramuscular, or Intravenous Use

Opioid Analgesic

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# Ⓝ MEPERIDINE HYDROCHLORIDE INJECTION USP

meperidine hydrochloride

## PART I: HEALTH PROFESSIONAL INFORMATION

### SUMMARY PRODUCT INFORMATION

Route of administration	Dosage Form / Strength	Nonmedicinal Ingredients
Subcutaneous, intramuscular or intravenous (after dilution)	50 mg/mL	Sodium hydroxide and/or hydrochloric acid, water.

### INDICATIONS AND CLINICAL USE

Meperidine Hydrochloride Injection USP is indicated for the relief of acute episodes of moderate to severe pain in many medical, surgical, obstetrical and dental situations (see DOSAGE AND ADMINISTRATION).

Meperidine Hydrochloride Injection USP is not indicated as an as-needed (prn) analgesic.

#### **Geriatrics (> 65 years of age)**

In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, concomitant disease or other drug therapy (see ACTION AND CLINICAL PHARMACOLOGY, Special Populations and Conditions, Geriatrics).

#### **Pediatrics (< 18 years of age)**

The safety and efficacy of Meperidine Hydrochloride Injection USP has not been studied in the pediatric population. Therefore the use of Meperidine Hydrochloride Injection USP is not recommended in patients under 18 years of age.

### CONTRAINDICATIONS

Meperidine is contraindicated in:

- Patients who are hypersensitive to the active substance meperidine or other opioid analgesics or to any ingredient in the formulation. For a complete listing of the excipients, see the DOSAGE FORMS, COMPOSITION AND PACKAGING section.
- In patients with known or suspected mechanical gastrointestinal obstruction (e.g., bowel obstruction or strictures) or any diseases/conditions that affect bowel transit (e.g., ileus of any type).
- Patients with suspected surgical abdomen (e.g., acute appendicitis or pancreatitis).
- Patients with mild pain that can be managed with other pain medications.

- Patients with acute or severe bronchial asthma, chronic obstructive airway, and or status asthmaticus.
- Patients with acute respiratory depression, elevated carbon dioxide levels in the blood and cor pulmonale.
- Patients with acute alcoholism, delirium tremens, and convulsive disorders.
- Patients with severe CNS depression, increased cerebrospinal or intracranial pressure, and head injury.
- Patients taking monoamine oxidase (MAO) inhibitors (or within 14 days of such therapy).

## WARNINGS AND PRECAUTIONS

### SERIOUS WARNINGS AND PRECAUTIONS

#### Limitations of Use

Because of the risks of addiction, abuse, and misuse with opioids, even at recommended doses, and because of the risks of overdose and death with immediate release opioid formulations, Meperidine Hydrochloride Injection USP should only be used in patients for whom alternative treatment options (e.g., non-opioid analgesics) are ineffective, not tolerated, or would be otherwise inadequate to provide appropriate management of pain (see DOSAGE AND ADMINISTRATION).

As with other CNS depressants, patients who have received Meperidine Hydrochloride Injection USP should have appropriate surveillance. Resuscitative equipment and a narcotic antagonist such as naloxone should be readily available to manage apnea.

#### Addiction, Abuse, and Misuse

Meperidine Hydrochloride Injection USP poses risks of opioid addiction, abuse, and misuse, which can lead to overdose and death. Each patient's risk should be assessed prior to prescribing Meperidine Hydrochloride Injection USP, and all patients should be monitored regularly for the development of these behaviours or conditions (see WARNINGS AND PRECAUTIONS). Meperidine Hydrochloride Injection USP should be stored securely to avoid theft or misuse.

#### Life-threatening Respiratory Depression: OVERDOSE

Serious, life-threatening, or fatal respiratory depression may occur with use of Meperidine Hydrochloride Injection USP. Infants exposed in-utero or through breast milk are at risk of life-threatening respiratory depression upon delivery or when nursed. Patients should be monitored for respiratory depression, especially during initiation of Meperidine Hydrochloride Injection USP or following a dose increase. Further, instruct patients of the hazards related to taking opioids including fatal overdose.

#### Accidental Exposure

**Accidental ingestion of even one dose of Meperidine Hydrochloride Injection USP, especially by children, can result in a fatal overdose of meperidine hydrochloride (see DOSAGE AND ADMINISTRATION, Disposal, for instructions on proper disposal).**

#### **Neonatal Opioid Withdrawal Syndrome**

**Prolonged maternal use of Meperidine Hydrochloride Injection USP during pregnancy can result in neonatal opioid withdrawal syndrome, which may be life-threatening (see WARNINGS AND PRECAUTIONS).**

#### **Interaction with Alcohol**

**The co-ingestion of alcohol with Meperidine Hydrochloride Injection USP should be avoided as it may result in dangerous additive effects, causing serious injury or death (see WARNINGS AND PRECAUTIONS and DRUG INTERACTIONS).**

#### **Risks From Concomitant Use With Benzodiazepines Or Other CNS Depressants**

**Concomitant use of opioids with benzodiazepines or other central nervous system (CNS) depressants, including alcohol, may result in sedation, respiratory depression, coma, and death (see WARNINGS AND PRECAUTIONS, Neurologic and DRUG INTERACTIONS).**

- **Reserve concomitant prescribing of Meperidine Hydrochloride Injection USP and benzodiazepines or other CNS depressants for use in patients for whom alternative treatment options are inadequate.**
- **Limit dosages and durations to the minimum required.**
- **Follow patients closely for signs and symptoms of sedation and respiratory depression.**

#### **General**

**Patients should be instructed not to give Meperidine Hydrochloride Injection USP (meperidine hydrochloride) to anyone other than for whom it was prescribed, as such inappropriate use may have severe medical consequences, including death. Meperidine Hydrochloride Injection USP should be stored securely to avoid theft or misuse.**

**Meperidine Hydrochloride Injection USP should only be prescribed by persons knowledgeable in the continuous administration of potent opioids, in the management of patients receiving potent opioids for the treatment of pain, and in the detection and management of respiratory depression, including the use of opioid antagonists.**

**Naloxone, resuscitative and intubation equipment and oxygen should be readily available.**

Patients should be cautioned not to consume alcohol while taking Meperidine Hydrochloride Injection USP as it may increase the chance of experiencing serious adverse events, including death.

#### **Abuse and Misuse**

Like all opioids, Meperidine Hydrochloride Injection USP is a potential drug of abuse and misuse, which can lead to overdose and death. Therefore, Meperidine Hydrochloride Injection USP should be prescribed and handled with caution.

Patients should be assessed for their clinical risks for opioid abuse or addiction prior to being prescribed opioids. All patients receiving opioids should be routinely monitored for signs of misuse and abuse.

Opioids, such as Meperidine Hydrochloride Injection USP, should be used with particular care in patients with a history of alcohol and illicit/prescription drug abuse and other mental health disorders including, but not limited to, major depression and anxiety. However, concerns about abuse, addiction, and diversion should not prevent the proper management of pain.

### **Cardiovascular**

Meperidine administration may result in severe hypotension in patients whose ability to maintain adequate blood pressure is compromised by reduced blood volume, or concurrent administration of drugs such as phenothiazines and other tranquilizers, sedative/hypnotics, tricyclic antidepressants or general anesthetics. Meperidine may produce orthostatic hypotension in ambulatory patients. These patients should be monitored for signs of hypotension after initiating or titrating the dose of Meperidine Hydrochloride Injection USP.

Meperidine should be used with caution in patients with atrial flutter and other supraventricular tachycardias because of a possible vagolytic action which may produce a significant increase in the ventricular response rate.

The use of Meperidine Hydrochloride Injection USP in patients with circulatory shock should be avoided as it may cause vasodilation that can further reduce cardiac output and blood pressure.

Rapid intravenous injection of opioid analgesics increases the possibility of hypotension and respiratory depression and should be avoided (see DOSAGE AND ADMINISTRATION).

### **Dependence/Tolerance**

As with other opioids, tolerance and physical dependence may develop upon repeated administration of Meperidine Hydrochloride Injection USP and there is a potential for development of psychological dependence.

Physical dependence and tolerance reflect the neuroadaptation of the opioid receptors to chronic exposure to an opioid, and are separate and distinct from abuse and addiction. Tolerance, as well as physical dependence, may develop upon repeated administration of opioids, and are not by themselves evidence of an addictive disorder or abuse.

Patients on prolonged therapy should be tapered gradually from the drug if it is no longer required for pain control. Withdrawal symptoms may occur following abrupt discontinuation of therapy or upon administration of an opioid antagonist. Some of the symptoms that may be associated with abrupt withdrawal of an opioid analgesic include body aches, diarrhea, gooseflesh, loss of appetite, nausea, nervousness or restlessness, anxiety, runny nose, sneezing, tremors or shivering, stomach cramps, tachycardia, trouble with sleeping, unusual increase in sweating, palpitations, unexplained fever, weakness and yawning (see ADVERSE REACTIONS, DOSAGE AND ADMINISTRATION, Adjustment or Reduction of Dosage).

**Use in Drug and Alcohol Addiction:**

Meperidine is an opioid with no approved use in the management of addictive disorders. Its proper usage in individuals with drug or alcohol dependence, either active or in remission, is for the management of pain requiring opioid analgesia. Patients with a history of addiction to drugs or alcohol may be at higher risk of becoming addicted to Meperidine Hydrochloride Injection USP; extreme caution and awareness is warranted to mitigate the risk.

**Endocrine****Adrenal Insufficiency**

Cases of adrenal insufficiency have been reported with opioid use, more often following greater than one month of use. Presentation of adrenal insufficiency may include non-specific symptoms and signs including nausea, vomiting, anorexia, fatigue, weakness, dizziness, and low blood pressure. If adrenal insufficiency is suspected, confirm the diagnosis with diagnostic testing as soon as possible. If adrenal insufficiency is diagnosed, treat with physiologic replacement doses of corticosteroids. Wean the patient off of the opioid to allow adrenal function to recover and continue corticosteroid treatment until adrenal function recovers. Other opioids may be tried as some cases reported use of a different opioid without recurrence of adrenal insufficiency. The information available does not identify any particular opioids as being more likely to be associated with adrenal insufficiency.

**Gastrointestinal Effects**

Meperidine and other morphine-like opioids have been shown to decrease bowel motility. Meperidine may obscure the diagnosis or clinical course of patients with acute abdominal conditions (see CONTRAINDICATIONS).

**Neonatal Opioid Withdrawal Syndrome (NOWS):**

Prolonged maternal use of opioids during pregnancy can result in withdrawal signs in the neonate. Neonatal opioid withdrawal syndrome, unlike opioid withdrawal syndrome in adults, may be life-threatening.

Neonatal opioid withdrawal syndrome presents as irritability, hyperactivity and abnormal sleep pattern, high pitched cry, tremor, vomiting, diarrhea and failure to gain weight. The onset, duration, and severity of neonatal opioid withdrawal syndrome vary based on the specific opioid used, duration of use, timing and amount of last maternal use, and rate of elimination of the drug by the newborn.

Meperidine Hydrochloride Injection USP is not recommended to be used in pregnant women unless, in the judgement of the physician, the potential benefits outweigh the risks. If Meperidine Hydrochloride Injection USP was used during pregnancy, special attention to NOWS is warranted.

**Neurologic**

**Interactions with Central Nervous System Depressants (including benzodiazepines and alcohol):** Meperidine should be used with caution and in a reduced dosage during concomitant administration of other opioid analgesics, general anesthetics, phenothiazines and other

tranquilizers, sedative-hypnotics, tricyclic antidepressants, antipsychotics, antihistamines, benzodiazepines, gabapentinoids, baclofen, centrally-active anti-emetics and other CNS depressants. Respiratory depression, hypotension and profound sedation, coma or death may result.

Observational studies have demonstrated that concomitant use of opioid analgesics and benzodiazepines increases the risk of drug-related mortality compared to use of opioid analgesics alone. Because of similar pharmacological properties, it is reasonable to expect similar risk with the concomitant use of other CNS depressant drugs with opioid analgesics (see DRUG INTERACTIONS). If the decision is made to prescribe a benzodiazepine or other CNS depressant concomitantly with an opioid analgesic, prescribe the lowest effective dosages and minimum durations of concomitant use. In patients already receiving an opioid analgesic, prescribe a lower initial dose of the benzodiazepine or other CNS depressant than indicated in the absence of an opioid, and titrate based on clinical response. If an opioid analgesic is initiated in a patient already taking a benzodiazepine or other CNS depressant, prescribe a lower initial dose of the opioid analgesic, and titrate based on clinical response. Follow patients closely for signs and symptoms of respiratory depression and sedation.

Advise both patients and caregivers about the risks of respiratory depression and sedation when Meperidine Hydrochloride Injection USP is used with benzodiazepines or other CNS depressants (including alcohol and illicit drugs). Advise patients not to drive or operate heavy machinery until the effects of concomitant use of the benzodiazepine or other CNS depressant have been determined. Screen patients for risk of substance use disorders, including opioid abuse and misuse, and warn them of the risk for overdose and death associated with the use of additional CNS depressants including alcohol and illicit drugs (see DRUG INTERACTIONS).

Meperidine Hydrochloride Injection USP should not be consumed with alcohol as it may increase the chance of experiencing dangerous side effects, including death (see CONTRAINDICATIONS and ADVERSE REACTIONS, Sedation, and DRUG INTERACTIONS).

Severe pain antagonizes the subjective and respiratory depressant actions of opioid analgesics. Should pain suddenly subside, these effects may rapidly become manifest.

**Head Injury:** The respiratory depressant effects of meperidine, and the capacity to elevate cerebrospinal fluid pressure, may be greatly increased in the presence of an already elevated intracranial pressure produced by trauma. Also, meperidine may produce confusion, miosis, vomiting and other side effects which obscure the clinical course of patients with head injury. In such patients, meperidine must be used with extreme caution and only if it is judged essential (see CONTRAINDICATIONS).

**Opioid induced hyperalgesia:** Opioid induced hyperalgesia (OIH) is a paradoxical response to an opioid in which there is an increase in pain perception despite stable or increased opioid exposure. It differs from tolerance, in which higher opioid doses are required to achieve the same analgesic effect or treat recurring pain. Clinically, OIH may be associated with high opioid doses, long term opioid treatment, and intra-operative opioid use. OIH may manifest as an unexplained increase in pain, more diffuse pain than pre-existing, or as pain from ordinary (i.e.



non-painful stimuli (allodynia), in the absence of disease progression. When OIH is suspected, the dose of opioid should be reduced or tapered off, if possible. It is reasonable to consider opioid rotation, or the use of a non-opioid strategy for pain control. There is currently no well-established treatment for OIH.

**Use in Patients with Convulsive or Seizure Disorders:** The meperidine in Meperidine Hydrochloride Injection USP may aggravate convulsions in patients with convulsive disorders, and may induce or aggravate seizures in some clinical settings. Therefore, Meperidine Hydrochloride Injection USP should not be used in these patients (see CONTRAINDICATIONS).

**Serotonin Toxicity / Serotonin Syndrome:** Serotonin toxicity, also known as serotonin syndrome, is a potentially life-threatening condition and has been reported with buprenorphine, including Meperidine Hydrochloride Injection USP, particularly during combined use with other serotonergic drugs (See 9 DRUG INTERACTIONS). Serotonin toxicity is characterised by neuromuscular excitation, autonomic stimulation (e.g., tachycardia, flushing) and altered mental state (e.g., anxiety, agitation, hypomania). In accordance with the Hunter Criteria, serotonin toxicity diagnosis is likely when, in the presence of at least one serotonergic agent, one of the following is observed:

- o Spontaneous clonus
- o Inducible clonus or ocular clonus with agitation or diaphoresis
- o Tremor and hyperreflexia
- o Hypertonia and body temperature  $>38^{\circ}\text{C}$  and ocular clonus or inducible clonus.

If concomitant treatment with Meperidine Hydrochloride Injection USP and other serotonergic agents is clinically warranted, careful observation of the patient is advised, particularly during treatment initiation and dose increases (see 9 DRUG INTERACTIONS). If serotonin toxicity is suspected, discontinuation of the serotonergic agents should be considered.

### **Peri-Operative Considerations**

Meperidine Hydrochloride Injection USP is not indicated for pre-emptive analgesia (administration pre-operatively for the management of post-operative pain).

In the case of planned chordotomy or other pain-relieving operations, patients should not be treated with Meperidine Hydrochloride Injection USP for at least 24 hours before the operation and Meperidine Hydrochloride Injection USP should not be used in the immediate post-operative period.

Physicians should individualize treatment, moving from parenteral to oral analgesics as appropriate. Thereafter, if Meperidine Hydrochloride Injection USP is to be continued after the patient recovers from the post-operative period, a new dosage should be administered in accordance with the changed need for pain relief. The risk of withdrawal in opioid-tolerant patients should be addressed as clinically indicated.

The administration of analgesics in the peri-operative period should be managed by healthcare providers with adequate training and experience (e.g., by an anesthesiologist).

Meperidine and other morphine-like opioids have been shown to decrease bowel motility. Ileus is a common post-operative complication, especially after intra-abdominal surgery with opioid analgesia. Caution should be taken to monitor for decreased bowel motility in post-operative patients receiving opioids. Standard supportive therapy should be implemented.

Meperidine Hydrochloride Injection USP should not be used in the early post-operative period (12 to 24 hours post-surgery) unless the patient is ambulatory and gastrointestinal function is normal.

### **Psychomotor Impairment**

Meperidine Hydrochloride Injection USP may impair the mental and/or physical abilities needed for certain potentially hazardous activities such as driving a car or operating machinery. Patients should be cautioned accordingly. Patients should also be cautioned about the combined effects of meperidine with other CNS depressants, including other opioids, phenothiazine, sedative/hypnotics and alcohol.

### **Respiratory**

**Respiratory Depression:** Serious, life-threatening, or fatal respiratory depression has been reported with the use of opioids, even when used as recommended. Respiratory depression from opioid use, if not immediately recognized and treated, may lead to respiratory arrest and death. Management of respiratory depression may include close observation, supportive measures, and use of opioid antagonists, depending on the patient's clinical status. Meperidine should be used with extreme caution in patients with acute asthma attack, chronic obstructive pulmonary disease or cor pulmonale, substantially decreased respiratory reserve, pre-existing respiratory depression, hypoxia or hypercapnia (see CONTRAINDICATIONS).

While serious, life-threatening, or fatal respiratory depression can occur at any time during the use of Meperidine Hydrochloride Injection USP, the risk is greatest during the initiation of therapy or following a dose increase. Patients should be closely monitored for respiratory depression when initiating therapy with Meperidine Hydrochloride Injection USP and following dose increases.

Life-threatening respiratory depression is more likely to occur in the elderly, cachectic, or debilitated patients because they may have altered pharmacokinetics or altered clearance compared to younger, healthier patients.

To reduce the risk of respiratory depression, proper dosing and titration of Meperidine Hydrochloride Injection USP are essential. Overestimating the Meperidine Hydrochloride Injection USP dose when converting patients from another opioid product can result in a fatal overdose with the first dose. In these patients, the use of non-opioid analgesics should be considered, if feasible (see WARNINGS AND PRECAUTIONS, Special Populations, Special Risk Groups; and DOSAGE AND ADMINISTRATION).

**Use in Patients with Chronic Pulmonary Disease:** Monitor patients with significant chronic obstructive pulmonary disease or cor pulmonale, and patients having a substantially decreased respiratory reserve, hypoxia, hypercapnia, or preexisting respiratory depression for respiratory

depression, particularly when initiating therapy and titrating with Meperidine Hydrochloride Injection USP, as in these patients, even usual therapeutic doses of Meperidine Hydrochloride Injection USP may decrease respiratory drive to the point of apnea. In these patients, use of alternative non-opioid analgesics should be considered, if possible. The use of Meperidine Hydrochloride Injection USP is contraindicated in Patients with acute or severe bronchial asthma, chronic obstructive airway, or status asthmaticus (see CONTRAINDICATIONS).

**Sleep Apnea:** Opioids can cause sleep-related breathing disorders including central sleep apnea (CSA) and sleep-related hypoxemia. Opioid use increases the risk of CSA in a dose-dependent fashion. In patients who present with CSA, consider decreasing the opioid dosage using best practices for opioid taper (see 4 DOSAGE AND ADMINISTRATION).

### **Sexual Function/Reproduction**

Long-term use of opioids may be associated with decreased sex hormone levels and symptoms such as low libido, erectile dysfunction, or infertility (see ADVERSE REACTIONS, Post-Market Adverse Drug Reactions).

### **Special Populations**

**Special Risk Groups:** Meperidine should be given with caution and the initial dose should be reduced in certain patients such as the elderly or debilitated, and those with hypothyroidism, Addison's disease and prostatic hypertrophy or urethral stricture (due to the risk of urinary retention), sickle cell anemia, delirium tremens, kyphoscoliosis associated with respiratory depression, pheochromocytoma. In patient with pheochromocytoma, meperidine has been reported to provoke hypertension. Meperidine should also be used with cautions in patients with decreased level of consciousness.

The administration of meperidine may obscure the diagnosis or clinical course in patients with acute abdominal conditions. All opioids may induce or aggravate seizures in some clinical settings.

### **Pregnant Women:**

Studies in humans have not been conducted. Meperidine Hydrochloride Injection USP crosses the placental barrier and is not recommended to be administered to pregnant women unless, in the judgement of the physician, potential benefits outweigh the risks.

Pregnant women using opioids should not discontinue their medication abruptly as this can cause pregnancy complication such as miscarriage or still-birth. Tapering should be slow and under medical supervision to avoid serious adverse events to the fetus.

Prolonged maternal use of opioids during pregnancy can result in withdrawal signs in the neonate. Neonatal opioid withdrawal syndrome, unlike opioid withdrawal syndrome in adults, may be life-threatening (see WARNINGS AND PRECAUTIONS, Neonatal Opioid Withdrawal Syndrome, ADVERSE REACTIONS, Post-marketing Experience).

**Labour, Delivery and Nursing Women:** Since opioids can cross the placental barrier and are excreted in breast milk, Meperidine Hydrochloride Injection USP is not recommended to be used in nursing women and during labour and delivery unless, in the judgement of the physician, the potential benefits outweigh the risks. Life-threatening respiratory depression can occur in the infant if opioids are administered to the mother. Naloxone, a drug that counters the effects of opioids, should be readily available if Meperidine Hydrochloride Injection USP is used in this population.

**Pediatrics (< 18 years of age):** The safety and efficacy of Meperidine Hydrochloride Injection USP have not been studied in the pediatric population. Therefore, use of Meperidine Hydrochloride Injection USP is not recommended in patients under 18 years of age.

**Geriatrics (> 65 years of age):** In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range and titrate slowly, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy (see DOSAGE AND ADMINISTRATION and ACTION AND CLINICAL PHARMACOLOGY, Special Populations and Conditions, Geriatrics).

**Patients with Hepatic Impairment:** Meperidine Hydrochloride Injection USP should be administered with caution and reduced initial doses to patients with liver dysfunction.

**Patients with Renal Impairment:** Meperidine Hydrochloride Injection USP should be administered with caution and reduced initial doses to patients with kidney dysfunction.

## ADVERSE REACTIONS

### Adverse Drug Reaction Overview

Adverse effects of Meperidine Hydrochloride Injection USP are similar to those of other opioid analgesics, and represent an extension of pharmacological effects of the drug class. The major hazards of opioids include respiratory and central nervous system depression and to a lesser degree, circulatory depression, respiratory arrest, shock and cardiac arrest.

### Most Frequently Observed

The most frequently observed adverse reactions include lightheadedness, dizziness, sedation, nausea, vomiting, and sweating. These effects seem to be more prominent in ambulatory patients and in those who are not experiencing severe pain. In such individuals, lower doses are advisable. Some adverse reactions in ambulatory patients may be alleviated if the patient lies down.

### Less Frequently Observed

Central Nervous System	Mood changes (such as euphoria, dysphoria), weakness, headache, agitation, tremor, muscle twitches, severe convulsions, uncoordinated muscle movements, transient hallucinations and disorientation, delirium or confusion, visual disturbances.
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	Inadvertent injection into or near a nerve trunk may result in sensory-motor paralysis which is usually, though not always, transitory.
Gastrointestinal	Dry mouth, constipation, biliary tract spasm.
Cardiovascular	Flushing of the face, tachycardia, bradycardia, palpitation, hypotension (see WARNINGS), syncope and phlebitis following IV injection.
Genitourinary	Urinary retention.
Dermatologic	Pruritus, urticaria, other skin rashes, wheal and flare over the vein with intravenous injection, hypersensitivity reactions including anaphylaxis.
Other	Pain at injection site; local tissue irritation and induration following subcutaneous injection, particularly when repeated; antidiuretic effect.

**Sedation:** Sedation is a common side effect of opioid analgesics, especially in opioid naïve individuals. Sedation may also occur partly because patients often recuperate from prolonged fatigue after the relief of persistent pain. Most patients develop tolerance to the sedative effects of opioids within three to five days and, if the sedation is not severe, will not require any treatment except reassurance. If excessive sedation persists beyond a few days, the dose of the opioid should be reduced and alternate causes investigated. Some of these are: concurrent CNS depressant medication, hepatic or renal dysfunction, brain metastases, hypercalcemia and respiratory failure. If it is necessary to reduce the dose, it can be carefully increased again after three or four days if it is obvious that the pain is not being well controlled. Dizziness and unsteadiness may be caused by postural hypotension, particularly in elderly or debilitated patients, and may be alleviated if the patient lies down.

**Nausea and Vomiting:** Nausea is a common side effect on initiation of therapy with opioid analgesics and is thought to occur by activation of the chemoreceptor trigger zone, stimulation of the vestibular apparatus and through delayed gastric emptying. The prevalence of nausea declines following continued treatment with opioid analgesics. When instituting therapy with an opioid for chronic pain, the routine prescription of an antiemetic should be considered. In the cancer patient, investigation of nausea should include such causes as constipation, bowel obstruction, uremia, hypercalcemia, hepatomegaly, tumor invasion of celiac plexus and concurrent use of drugs with emetogenic properties. Persistent nausea which does not respond to dosage reduction may be caused by opioid-induced gastric stasis and may be accompanied by other symptoms including anorexia, early satiety, vomiting and abdominal fullness. These symptoms respond to chronic treatment with gastrointestinal prokinetic agents.

**Constipation:** Practically all patients become constipated while taking opioids on a persistent basis. In some patients, particularly the elderly or bedridden, fecal impaction may result. It is essential to caution the patients in this regard and to institute an appropriate regimen of bowel management at the start of prolonged opioid therapy. Stimulant laxatives, stool softeners, and other appropriate measures should be used as required. As fecal impaction may present as

overflow diarrhea, the presence of constipation should be excluded in patients on opioid therapy prior to initiating treatment for diarrhea.

### **Post-Marketing Experience**

**Androgen deficiency:** Chronic use of opioids may influence the hypothalamic-pituitary-gonadal axis, leading to androgen deficiency that may manifest as low libido, impotence, erectile dysfunction, amenorrhea, or infertility. The causal role of opioids in the clinical syndrome of hypogonadism is unknown because the various medical, physical, lifestyle, and psychological stressors that may influence gonadal hormone levels have not been adequately controlled for in studies conducted to date. Patients presenting with symptoms of androgen deficiency should undergo laboratory evaluation.

## **DRUG INTERACTIONS**

### **Overview**

**Interaction with Benzodiazepines and Other Central Nervous System (CNS) Depressants:** Due to additive pharmacologic effect, the concomitant use of benzodiazepines or other CNS depressants (e.g. other opioids, sedatives, gabapentinoids such as pregabalin, baclofen, hypnotics, antidepressants, anxiolytics, tranquilizers, muscle relaxants, general anesthetics, antipsychotics, phenothiazines, neuroleptics, antihistamines, antiemetics, and alcohol) and beta-blockers, increases the risk of respiratory depression, profound sedation, coma, and death. Reserve concomitant prescribing of these drugs for use in patients for whom alternative treatment options are inadequate. Limit dosages and durations to the minimum required. Follow patients closely for signs of respiratory depression and sedation (see WARNINGS AND PRECAUTIONS, Neurologic, Interactions with Central Nervous System Depressants (including benzodiazepines and alcohol) and Psychomotor Impairment). Meperidine Hydrochloride Injection USP should not be consumed with alcohol as it may increase the chance of experiencing dangerous side effects.

### **Drug-Drug Interactions**

**Serotonin Agents:** Coadministration of meperidine with a serotonergic agent, such as a Selective Serotonin Re-uptake Inhibitor or a Serotonin Norepinephrine Re-uptake Inhibitor, may increase the risk of serotonin syndrome, a potentially life-threatening condition (see WARNINGS AND PRECAUTIONS, Neurologic).

**CNS Depressants:** Meperidine should be used with great caution and in reduced dosage in patients who are concurrently receiving other narcotic analgesics, general anesthetics, phenothiazines, other tranquilizers (see DOSAGE AND ADMINISTRATION), sedative-hypnotics (including barbiturates), tricyclic antidepressants, benzodiazepines and other CNS depressants (including alcohol). Respiratory depression (which can be fatal), hypotension, and profound sedation or coma may result.

**Ritonavir:** Plasma concentrations of the metabolite normeperidine may be increased by ritonavir, thus caution should be exercised when used concomitantly.

**Phenytoin:** The hepatic metabolism of meperidine may be enhanced by phenytoin. Concomitant administration may result in reduced half-life and bioavailability of meperidine, and an increase in normeperidine concentration; thus caution should be exercised when used concomitantly.

**Cimetidine:** Cimetidine reduced the clearance and volume of distribution of meperidine and also the formation of the metabolite normeperidine; thus caution should be used with concomitant administration.

**Morphine agonist-antagonists:** Use of meperidine with morphine agonist-antagonists (buprenorphine, nalbuphine, pentazocine) may result in decreased analgesic effect and withdrawal syndrome due to competitive blocking of receptors.

**MAO inhibitors:** Meperidine is contraindicated in patients who are receiving MAO inhibitors or those who have recently received such agents (see Contraindications).

**Acyclovir:** Plasma concentrations of meperidine and its metabolite, normeperidine, may be increased by acyclovir, thus caution should be used with concomitant administration.

**Skeletal muscle relaxants:** Opioid analgesics, including meperidine, may enhance the neuromuscular blocking action of skeletal muscle relaxants and produce an increase degree of respiratory depression.

### **Drug-Lifestyle Interactions**

The concomitant use of alcohol should be avoided (see WARNINGS AND PRECAUTIONS, General).

## **DOSAGE AND ADMINISTRATION**

**Meperidine Hydrochloride Injection USP should only be used in patients for whom alternative treatment options are ineffective or not tolerated (e.g., non-opioid analgesics).**

### **Dosing Considerations**

Meperidine Hydrochloride Injection USP should be used with caution within 12 hours pre-operatively and within the first 12-24 hours post-operatively (see WARNINGS AND PRECAUTIONS, Peri-operative Considerations).

Meperidine Hydrochloride Injection USP is not indicated for rectal administration.

Rapid intravenous injection of opioid analgesics increases the possibility of hypotension and respiratory depression.

**For acute pain, it is recommended that Meperidine Hydrochloride Injection USP be used for a maximum of 7 days at the lowest dose that provides adequate pain relief.**

All doses of opioids carry an inherent risk of fatal or non-fatal adverse events. This risk is increased with higher doses. For the management of chronic non-cancer, non-palliative pain, it is recommended that 112.5 mg (90 morphine milligram equivalent) daily of Meperidine Hydrochloride Injection USP not be exceeded. Each patient should be assessed for their risk prior to prescribing Meperidine Hydrochloride Injection USP, as the likelihood of experiencing serious adverse events can depend upon the type of opioid, duration of treatment, level of pain as well as the patient's own level of tolerance. In addition, the level of pain should be assessed routinely to confirm the most appropriate dose and the need for further use of Meperidine Hydrochloride Injection USP (see DOSAGE AND ADMINISTRATION, Adjustment or reduction of Dosage).

### **Recommended Dose and Dosage Adjustment**

#### **Pain Relief**

**Adults:** The average adult dose is 50 to 150 mg, IM or SC. Repeat at intervals of 3 to 4 hours as required.

**Children:** 1.1 to 1.8 mg/kg, IM or SC at 3 or 4 hour intervals. Do not exceed adult dose.

Dosage should be adjusted according to severity of pain and patient response. While SC administration is suitable for occasional use, IM is preferred when repeated doses are required. If IV administration is required, dosage should be decreased and the injection made very slowly, preferably utilizing a diluted solution. Meperidine is less effective orally than on parenteral administration.

When administered concomitantly with phenothiazines and tranquilizers, meperidine dose should be reduced proportionally (usually 25 to 50%) since these potentiate the action of meperidine.

#### **Preoperative Medication**

**Adults:** 50 to 100 mg IM or SC 30 to 90 minutes prior to anesthesia.

**Children:** The usual dosage is 1.1 mg/kg to 2.2 mg/kg IM or SC up to the adult dose, 30 to 90 minutes before the beginning of anesthesia.

#### **Support of Anesthesia**

Repeated slow IV injections of diluted doses (e.g. 10 mg/mL) or continuous IV infusion of a more dilute solution (e.g. 1 mg/mL) should be used. The dose should be titrated to the needs of the patient and will depend on the premedication and type of anesthesia being employed, the characteristics of the particular patient, and the nature and duration of the operative procedure.

#### **Obstetrical Analgesia**

50 to 100 mg IM or SC when pain becomes regular, may be repeated at 1 to 3 hour intervals.

**Intravenous Use:** If necessary, meperidine may be given IV, but the injection should be given very slowly, preferably in the form of a diluted solution. Rapid IV injection of opioid analgesics, including meperidine, increases the incidence of adverse reactions; severe respiratory depression, apnea, hypotension, peripheral circulatory collapse, and cardiac arrest have occurred. Meperidine



should not be administered IV unless an opioid antagonist and the facilities for assisted or controlled respiration are immediately available. When meperidine is given parenterally, especially IV, the patient should be lying down.

**Intramuscular Use:** Meperidine should be injected well within the body of a large muscle.

### Opioid Rotation

Conversion ratios for opioids are subject to variations in kinetics governed by genetics and other factors. When switching from one opioid to another, consider reducing the calculated dose by 25-50% to minimize the risk of overdose. Subsequently, up-titrate the dose, as required, to reach the appropriate maintenance dose

### OPIOID ANALGESICS: APPROXIMATE ANALGESIC EQUIVALENCES<sup>1</sup>

Drug	Equivalent Dose (mg) <sup>2</sup> (compared to morphine 10 mg IM)		Duration of Action (hours)
	Parenteral	Oral	
<b>Strong Opioid Agonists:</b>			
Morphine	10	60 <sup>3</sup>	3-4
Oxycodone	15	30 <sup>4</sup>	2-4
Hydromorphone	1.5	7.5	2-4
Anileridine	25	75	2-3
Levorphanol	2	4	4-8
Meperidine <sup>6</sup>	75	300	1-3
Oxymorphone	1.5	5 (rectal)	3-4
Methadone <sup>5</sup>	-	-	-
Heroin	5-8	10-15	3-4
<b>Weak Opioid Agonists:</b>			
Codeine	120	200	3-4
Propoxyphene	50	100	2-4
<b>Mixed Agonist-Antagonists<sup>7</sup>:</b>			
Pentazocine <sup>6</sup>	60	180	3-4
Nalbuphine	10	-	3-6
Butorphanol	2	-	3-4

Footnotes:

<sup>1</sup>References:

Expert Advisory Committee on the Management of Severe Chronic Pain in Cancer Patients, Health and Welfare Canada. Cancer pain: A monograph on the management of cancer pain. Ministry of Supplies and Services Canada, 1987. Cat. No. H42-2/5-1984E.

Foley KM. The treatment of cancer pain. *N Engl J Med* 1985;313(2):84-95.

Aronoff GM, Evans WO. Pharmacological management of chronic pain: A review. In: Aronoff GM, editor. Evaluation and treatment of chronic pain. 2nd ed. Baltimore (MD): Williams and Wilkins; 1992. p. 359-68.

Cherny NI, Portenoy RK. Practical issues in the management of cancer pain. In: Wall PD, Melzack R, editors. Textbook of pain. 3rd ed. New York: Churchill Livingstone; 1994. p. 1437-67.

<sup>2</sup> Most of the data were derived from single-dose, acute pain studies and should be considered an approximation for selection of doses when treating chronic pain. As analgesic conversion factors are approximate and patient response may vary, dosing should be individualized according to relief of pain and side effects. Because of incomplete cross-tolerance, dose reductions of 25% to 50% of the equianalgesic dose may be appropriate in some patients when converting from one opioid to another, particularly at high doses.† Upward titration may be required to reach appropriate maintenance doses.

†Levy MH. Pharmacologic treatment of cancer pain. *N Engl J Med* 1996;335:1124-1132.

<sup>3</sup> For acute pain, the oral or rectal dose of morphine is six times the injectable dose. However, for chronic dosing, clinical experience indicates that this ratio is 2-3:1 (i.e., 20-30 mg of oral or rectal morphine is equivalent to 10 mg of parenteral morphine).

<sup>4</sup> Based on single entity oral oxycodone in acute pain.

<sup>5</sup> Extremely variable equianalgesic dose. Patients should undergo individualized titration starting at an equivalent to 1/10 of the morphine dose.

<sup>6</sup> Not recommended for the management of chronic pain.

<sup>7</sup> Mixed agonist-antagonists can precipitate withdrawal in patients on pure opioid agonists.

### **Geriatrics:**

Respiratory depression has occurred in the elderly following administration of large initial doses of opioids to patients who were not opioid-tolerant or when opioids were co-administered with other agents that can depress respiration. Meperidine Hydrochloride Injection USP should be initiated at a low dose and slowly titrated to effect (see WARNINGS AND PRECAUTIONS).

### **Patients with Hepatic Impairment:**

Patients with liver dysfunction may show an exaggerated response to customary doses. In these individuals, Meperidine Hydrochloride Injection USP should be used with caution and administered in reduced amounts.

### **Patients with Renal Impairment:**

Patients with renal dysfunction may show an exaggerated response to customary doses. In these individuals, Meperidine Hydrochloride Injection USP should be used with caution and administered in reduced amounts.

### **Use with Non-Opioid Medications:**

If a non-opioid analgesic is being provided, it may be continued. If the non-opioid is discontinued, consideration should be given to increasing the opioid dose to compensate for the non-opioid analgesic. Meperidine Hydrochloride Injection USP can be safely used concomitantly with usual doses of other non-opioid analgesics.

### **Dose Titration:**

Dose titration is the key to success with opioid analgesic therapy. **Proper optimization of doses scaled to the relief of the individual's pain should aim at administration of the lowest dose which will achieve the overall treatment goal of satisfactory pain relief with acceptable side effects.**

Dosage adjustments should be based on the patient's clinical response.

### **Adjustment or Reduction of Dosage:**

Physical dependence with or without psychological dependence tends to occur with chronic administration of opioids, including Meperidine Hydrochloride Injection USP. Withdrawal (abstinence) symptoms may occur following abrupt discontinuation of therapy. These symptoms may include body aches, diarrhea, gooseflesh, loss of appetite, nausea, nervousness or restlessness, runny nose, sneezing, tremors or shivering, stomach cramps, tachycardia, trouble with sleeping, unusual increase in sweating, palpitations, unexplained fever, weakness and yawning.

Following successful relief of moderate to severe pain, periodic attempts to reduce the opioid dose should be made. Smaller doses or complete discontinuation may become feasible due to a change in the patient's condition or mental state. Patients on prolonged therapy should be withdrawn gradually from the drug if it is no longer required for pain control. In patients who are appropriately treated with opioid analgesics and who undergo gradual withdrawal from the drug, these symptoms are usually mild (see WARNINGS AND PRECAUTIONS). Tapering should be individualised and carried out under medical supervision.

Patient should be informed that reducing and/or discontinuing opioids decreases their tolerance to these drugs. If treatment needs to be re-initiated, the patient must start at the lowest dose and titrate up to avoid overdose.

### **Disposal**

Meperidine Hydrochloride Injection USP should be kept in a safe place, out of the sight and reach of children before, during and after use. Meperidine Hydrochloride Injection USP should never be disposed of in trash. Unused or expired Meperidine Hydrochloride Injection USP should be properly disposed of as soon as it is no longer needed to prevent accidental exposure to others.

Meperidine Hydrochloride Injection USP should not be used in front of children, since they may copy these actions.

### **Missed Dose**

If a dose has been missed, the next dose should be administered at the next scheduled time and in the normal amount.

## **OVERDOSAGE**

For management of a suspected drug overdose, contact your regional Poison Control Centre immediately.
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### **Symptoms**

In chronic overdosage, which may occur in those who are tolerant to its depressant effects, meperidine may produce tremors, muscle twitches, dilated pupils, hyperactive reflexes and convulsions. These excitatory symptoms are due to the accumulation of normeperidine.

Acute overdosage with meperidine is likely to lead to respiratory depression (a decrease in respiratory rate and/or tidal volume, Cheyne-Stokes respiration, cyanosis), extreme somnolence progressing to stupor or coma, myosis, hypothermia, skeletal muscle flaccidity, cold and clammy skin, toxic leukoencephalopathy, delayed post-hypoxic leukoencephalopathy, and sometimes bradycardia and hypotension.

In severe overdosage, particularly by the IV route, apnea, circulatory collapse, cardiac arrest, and death may occur.

## **Treatment**

Primary attention should be given to the re-establishment of adequate respiratory exchange through appropriate attention to airway and provision of assisted or controlled ventilation. Intensive supportive therapy may also be required to correct shock. The specific antagonist naloxone HCl can very rapidly counteract the severe respiratory depression and coma which may result from overdosage or unusual sensitivity to meperidine. If clinically significant respiratory or cardiovascular depression is present, an appropriate dose of naloxone HCl should be administered, preferably IV. Patients should be closely observed to determine any need for further treatment with naloxone since its duration of action may be exceeded by that of meperidine, particularly if the dose of meperidine the patient received was large.

An antagonist should not be administered in the absence of clinically significant respiratory or cardiovascular depression.

Oxygen, IV fluids, vasopressors, and other supportive measures should be employed as indicated.

It should be noted that in subjects physically dependent on opioids, the administration of an opioid antagonist is likely to precipitate an acute withdrawal syndrome. The use of an opioid antagonist in such individuals should be avoided if possible, but if its use proves necessary, extreme caution should be observed. The initial dose should be reduced to 1/5 to 1/10 of that which would be indicated in a normal subject.

In cases of overdosage with oral meperidine, the stomach should be evacuated by emesis or gastric lavage.

## **ACTION AND CLINICAL PHARMACOLOGY**

Meperidine is an opioid analgesic which acts predominantly as a mu-agonist.

In its effects on the Central Nervous System (CNS), meperidine resembles but is not identical to morphine. Analgesic effects are detectable within about 15 minutes following oral administration, reaching a peak within about 2 hours and subsiding gradually over several hours thereafter. Onset of analgesic effect is faster (within 10 minutes) after SC or IM administration, reaching a peak within about 1 hour that corresponds closely to the peak concentrations in plasma. In clinical use, the duration of effective analgesia is about 3 to 5 hours. Given parenterally, 75 to 100 mg of meperidine is approximately equivalent to 10 mg of morphine in analgesic effectiveness. At equianalgesic dosage, the 2 agents are comparable in the degree of sedation and of respiratory depression they produce. Given parenterally, meperidine is more than twice as effective as given orally in terms of the total analgesic response obtained. This is consistent with an oral bioavailability of about 40 to 60%.

In its effects on the cardiovascular system, meperidine generally resembles morphine, including its ability to release histamine upon parenteral administration. Heart rate is unlikely to be significantly affected with IM administration but may increase, with IV administration. As with

morphine, respiratory depression leads to an accumulation of carbon dioxide which in turn produces cerebrovascular dilatation, increase in cerebral blood flow and elevation of cerebrospinal fluid pressure.

The effects of meperidine on smooth muscle are qualitatively similar, but in relation to analgesic effect less intense than those of other opioids. Meperidine does not cause as much constipation when given over prolonged periods of time. This may be related to its greater facility to enter the CNS, thereby producing analgesia at lower peripheral concentrations. At equianalgesic dosage, the rise in pressure in the common bile duct induced by meperidine is less than that by morphine, but greater than that by codeine. Clinical doses of meperidine nevertheless slow gastric emptying sufficiently to delay absorption of other drugs significantly. The uterus of nonpregnant women is usually mildly stimulated by meperidine. Therapeutic doses given during active labour do not delay the birth process; in fact, the frequency, duration and amplitude of uterine contractions may sometimes be increased. Meperidine does not interfere with normal postpartum contraction or involution of the uterus and does not increase the incidence of postpartum hemorrhage.

Following IM injection, peak plasma concentration is usually obtained at about 45 minutes, but the range in time is wide. After oral administration, only about 50% of meperidine escapes first-pass metabolism. Peak concentrations in the plasma are usually observed in 1 to 2 hours. Approximately 60% is bound to plasma proteins. Meperidine is metabolized chiefly in the liver. The plasma elimination half-life is normally 3 to 4 hours, but this may be extended considerably in the presence of significant hepatic disease. In patients with cirrhosis, bioavailability may be increased as much as 80%.

Meperidine is hydrolyzed to meperidinic acid, which in turn is partially conjugated. Meperidine also undergoes N-demethylation to normeperidine, which may then be hydrolyzed to normeperidinic acid and subsequently conjugated. Normeperidine has a considerably longer plasma elimination half-life (15 to 20 hours) than its parent molecule. Normeperidine has an excitatory effect on the CNS, which is linked to tremors, muscle twitches, and seizures observed in patients with overdosage. In the presence of renal insufficiency, normeperidine elimination is reduced.

At the usual values of urinary pH, or if the urine is alkaline, excretion of unchanged meperidine is negligible; urinary excretion of meperidine and normeperidine is enhanced by acidification of the urine. Meperidine crosses the placenta and appears in milk.

### **Central Nervous System:**

Meperidine produces respiratory depression by direct action on brain stem respiratory centres. The respiratory depression involves both a reduction in the responsiveness of the brain stem centres to increases in CO<sub>2</sub> tension and to electrical stimulation.

Meperidine depresses the cough reflex by direct effect on the cough centre in the medulla. Antitussive effects may occur with doses lower than those usually required for analgesia.

Meperidine causes miosis, even in total darkness. Pinpoint pupils are a sign of opioid overdose but are not pathognomonic (e.g., pontine lesions of hemorrhagic or ischemic origin may produce

similar findings). Marked mydriasis rather than miosis may be seen with hypoxia in the setting of meperidine overdose.

#### **Gastrointestinal Tract and Other Smooth Muscle:**

Meperidine causes a reduction in motility associated with an increase in smooth muscle tone in the antrum of the stomach and duodenum. Digestion of food in the small intestine is delayed and propulsive contractions are decreased. Propulsive peristaltic waves in the colon are decreased, while tone may be increased to the point of spasm resulting in constipation. Other opioid-induced effects may include a reduction in gastric, biliary and pancreatic secretions, spasm of the sphincter of Oddi, and transient elevations in serum amylase.

#### **Cardiovascular System:**

Meperidine may produce release of histamine with or without associated peripheral vasodilation. Manifestations of histamine release and/or peripheral vasodilatation may include pruritus, flushing, red eyes, hyperhidrosis and/or orthostatic hypotension.

#### **Endocrine System:**

Opioids may influence the hypothalamic-pituitary-adrenal or -gonadal axes. Some changes that can be seen include an increase in serum prolactin, and decreases in plasma cortisol and testosterone. Clinical signs and symptoms may be manifest from these hormonal changes.

#### **Immune System:**

In vitro and animal studies indicate that opioids have a variety of effects on immune functions, depending on the context in which they are used. The clinical significance of these findings is unknown.

#### **Special Populations and Conditions:**

**Pediatrics:** Individuals under 18 years of age should not take Meperidine Hydrochloride Injection USP.

#### **Geriatrics:**

In general, dose selection for an elderly patient should be cautious, usually starting at the low end of the dosing range and titrate slowly, reflecting the greater frequency of decreased hepatic, renal, or cardiac function, and of concomitant disease or other drug therapy (see DOSAGE AND ADMINISTRATION, Recommended Dose and Dosage Adjustment, Elderly).

### **STORAGE AND STABILITY**

Store between 15 and 30°C.

### **SPECIAL HANDLING INSTRUCTIONS**

Not applicable.

## **DOSAGE FORMS, COMPOSITION AND PACKAGING**

### **Meperidine Hydrochloride Injection USP, 50 mg/mL**

Each mL contains: meperidine hydrochloride 50 mg, sodium hydroxide and/or hydrochloric acid to adjust pH and water for injection. Available in ampoules of 1 mL, boxes of 10.

## PART II: SCIENTIFIC INFORMATION

### PHARMACEUTICAL INFORMATION

#### Drug Substance

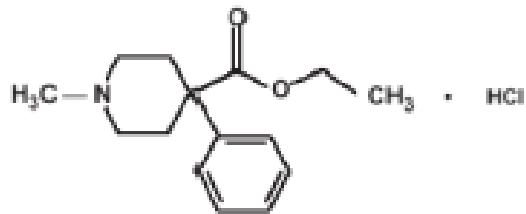
**Proper name:** Meperidine Hydrochloride

**Chemical name:** Meperidine Hydrochloride

**Molecular formula:** C<sub>15</sub>H<sub>21</sub>NO<sub>2</sub> HCl

**Molecular mass:** 283.796 g/mol

**Structural formula:**



**Physicochemical Properties:** Clear and colorless liquid. Not photosensitive.



## PATIENT MEDICATION INFORMATION

### READ THIS FOR SAFE AND EFFECTIVE USE OF YOUR MEDICINE

#### ⓃMEPERIDINE HYDROCHLORIDE INJECTION USP

##### (meperidine hydrochloride injection)

Read this carefully before you start taking **Meperidine Hydrochloride Injection USP** and each time you get a refill. This leaflet is a summary and will not tell you everything about this drug. Talk to your healthcare professional about your medical condition and treatment and ask if there is any new information about **Meperidine Hydrochloride Injection USP**.

#### Serious Warnings and Precautions

- Meperidine Hydrochloride Injection USP will be given to you by a healthcare professional who is specially trained to give this kind of medicine. They will give you Meperidine Hydrochloride Injection USP in a medical setting where:
  - they can closely monitor your health and
  - there is the appropriate equipment (including naloxone) to react to any unwanted side effects.
- Even if you take Meperidine Hydrochloride Injection USP as prescribed you are at a risk for opioid addiction, abuse and misuse. This can lead to overdose and death. To understand your risk for opioid addiction, abuse, and misuse, you should speak to your healthcare professional.
- Life-threatening breathing problems can happen while taking Meperidine Hydrochloride Injection USP, especially if not taken as directed. Babies are at risk of life-threatening breathing problems if their mothers take opioids while pregnant or nursing.
- If a person has not been prescribed Meperidine Hydrochloride Injection USP, taking even one dose can cause a fatal overdose. This is especially true for children.
- If you took Meperidine Hydrochloride Injection USP while you were pregnant, whether for short or long periods of time or in small or large doses, your baby can suffer life-threatening withdrawal symptoms after birth. This can occur in the days after birth and for up to 4 weeks after delivery. If your baby has any of the following symptoms:
  - has changes in their breathing (such as weak, difficult or fast breathing),
  - is unusually difficult to comfort,
  - as tremors (shakiness),
  - has increased stools, sneezing, yawning, vomiting, or fever,Seek immediate medical help for your baby.

- Taking Meperidine Hydrochloride Injection USP with other opioid medicines, benzodiazepines, alcohol, or other central nervous system depressants (including street drugs) can cause severe drowsiness, decreased awareness, breathing problems, coma, and death.

### **What is Meperidine Hydrochloride Injection USP used for?**

Meperidine Hydrochloride Injection USP is used in adults to manage short-term (acute) moderate to severe pain. It is NOT used “as needed” to treat pain that you only have once in a while.

### **How does Meperidine Hydrochloride Injection USP work?**

Meperidine Hydrochloride Injection USP is a painkiller belonging to the class of medicines known as opioids. It relieves pain by acting on specific nerve cells of the spinal cord and brain.

### **What are the ingredients in Meperidine Hydrochloride Injection USP?**

Medicinal ingredient: meperidine hydrochloride.

Non-medicinal ingredients: sodium hydroxide and/or hydrochloric acid to adjust pH, and water for injection.

### **Meperidine Hydrochloride Injection USP comes in the following dosage forms:**

Solution for injection: 50 mg/mL of meperidine hydrochloride.

### **Do not use Meperidine Hydrochloride Injection USP if:**

- your healthcare professional did not prescribe it for you.
- you are allergic to meperidine, other opioids, or any of the other ingredients in Meperidine Hydrochloride Injection.
- you have mild pain that can be controlled by the occasional use of painkillers including those available without a prescription.
- you have severe asthma, trouble breathing, or other lung problems.
- you have any heart problems.
- you have bowel blockage or narrowing of the stomach or intestines.
- you have a condition where the bowel does not work properly (ileus) or have severe pain in your abdomen.
- you have increased pressure in your skull or have a head injury.
- you have epilepsy (seizures) or a history with epilepsy.
- you suffer from alcoholism or alcohol withdrawal.
- you are taking, or have taken within the past 2 weeks, a monoamine oxidase inhibitor (MAOI) (such as phenelzine sulphate, tranylcypromine sulphate, moclobemide, or selegiline).
- you are going to have a surgery or operation, or have had a surgery in the last 24 hours.
- you have severe central nervous system (CNS) depression (nervous system slows down).

**To help avoid side effects and ensure proper use, talk to your healthcare professional before you take Meperidine Hydrochloride Injection USP. Talk about any health conditions or problems you may have, including if you:**

- have a history of illicit or prescription drug or alcohol abuse.
- have kidney problems.
- have liver problems.
- have been told you are at risk of having heart problems or seizures.
- have low blood pressure.
- have or have had problems with your mood (such as depression or anxiety), hallucinations, or other mental health problems.
- suffer from chronic or severe constipation.
- have problems with your thyroid, adrenal, or prostate gland.
- have, or had in the past hallucinations or other severe mental problems.
- suffer from migraines.
- have a sleep disorder which causes pauses in breathing or shallow breathing while sleeping (sleep apnea).
- are planning on drinking alcohol. Drinking alcohol while taking Meperidine Hydrochloride Injection USP may cause dangerous side effects, including death. Do NOT drink alcohol while taking Meperidine Hydrochloride Injection USP.
- have a condition that causes weakness or frailty.
- are pregnant or planning to become pregnant.
- are breastfeeding or planning to breastfeed.
- have difficulty urinating.
- are 65 years of age and older.

**Other warnings you should know about:**

Taking Meperidine Hydrochloride Injection USP can cause the following serious side effects:

- **Disorder of the adrenal gland:** You may develop a disorder of the adrenal gland called adrenal insufficiency. This means that your adrenal gland is not making enough of certain hormones. You may experience symptoms such as:
  - nausea, vomiting;
  - feeling tired, weak, or dizzy;
  - decreased appetite.

You may be more likely to have problems with your adrenal gland if you have been taking opioids for longer than one month. Your healthcare professional may do tests, give you another medication, and slowly take you off Meperidine Hydrochloride Injection USP.

- **Serotonin syndrome (also known as serotonin syndrome):** Meperidine Hydrochloride Injection USP can cause serotonin toxicity, a rare but potentially life-threatening condition. It can cause serious changes in how your brain, muscles and digestive system work. You may develop serotonin toxicity if you take Meperidine Hydrochloride Injection USP with certain anti-depressants or migraine medications.

Serotonin Syndrome symptoms include:

- fever, sweating, shivering, diarrhea, nausea, vomiting;
  - muscle shakes, jerks, twitches or stiffness, overactive reflexes, loss of coordination;
  - fast heartbeat, changes in blood pressure;
  - confusion, agitation, restlessness, hallucinations, mood changes, unconsciousness, and coma.
- **Sleep apnea:** Opioids can cause a problem called sleep apnea (stopping breathing from time to time while sleeping). Tell your healthcare professional if you have a history of sleep apnea or if anyone notices that you stop breathing from time to time while sleeping.

See the **Serious side effects and what to do about them** table below for more information on these and other serious side effects.

**Opioid dependence and addiction:** There are important differences between physical dependence and addiction. It is important that you talk to your healthcare professional if you have questions or concerns about abuse, addiction or physical dependence.

**Pregnancy, nursing, labour and delivery:** Opioids can be transferred to your baby through breast milk, or while still in the womb. Meperidine Hydrochloride Injection USP can then cause life-threatening breathing problems in your unborn baby or nursing infant. Your healthcare professional will determine if the benefits of using Meperidine Hydrochloride Injection USP outweigh the risks to your unborn baby or nursing infant.

If you are pregnant and are taking Meperidine Hydrochloride Injection USP, it is important that you don't stop taking your medication all of a sudden. If you do, it can cause a miscarriage or a still-birth. Your healthcare professional will monitor and guide you on how to slowly stop taking Meperidine Hydrochloride Injection USP. This may help avoid serious harm to your unborn baby.

**Sexual function/reproduction:** Long term use of opioids may lead to a decrease in sex hormone levels. It may also lead to low libido (desire to have sex), erectile dysfunction, or being infertile.

**Driving and using machines:** Before you do tasks which may require special attention, you should wait until you know how you react to Meperidine Hydrochloride Injection USP. Meperidine Hydrochloride Injection USP can cause:

- drowsiness,
- dizziness, or
- lightheadedness.

This can usually occur after you take your first dose and when your dose is increased.

**Worsened pain:** Taking opioids for pain can sometimes have the unintended effect of making your pain feel worse (opioid-induced hyperalgesia) even though your opioid dose has been unchanged or increased. This can also include feeling pain in new places in your body, or

feeling pain from something that would not normally hurt, for example, feeling pain from clothing touching your skin. Tell your healthcare professional if you notice a change like this in your pain while you are taking Meperidine Hydrochloride Injection USP.

**Tell your healthcare professional about all the medicines you take, including any drugs, vitamins, minerals, natural supplements or alternative medicines.**

**The following may interact with Meperidine Hydrochloride Injection USP:**

- alcohol. This includes prescription and non-prescription medications that contain alcohol. Do not drink alcohol while you are taking Meperidine Hydrochloride Injection USP. It can lead to:
  - drowsiness,
  - unusually slow or weak breathing,
  - serious side effects, or
  - a fatal overdose.
- other sedative medicines that may enhance the drowsiness caused by Meperidine Hydrochloride Injection USP.
- other opioid analgesics, medicines used to treat pain (e.g., morphine, buprenorphine, nalbuphine, or pentazocine).
- general anesthetics, medicines used during surgery.
- medicines used to help you sleep or that help reduce anxiety (e.g., benzodiazepines, tranquilizers, or hypnotics such as barbiturates).
- antidepressants, medicines used to treat depression and mood disorders. **Do not** take Meperidine Hydrochloride Injection USP with MAO inhibitors (MAOi) or if you have taken MAOi's in the last 14 days.
- medicines used to treat serious mental or emotional disorders, such as schizophrenia (e.g., phenothiazines).
- antihistamines, medicines used to treat allergies.
- anti-emetics, medicines used for the prevention of vomiting.
- muscle relaxants, medicines used to treat muscle spasms and back pain (e.g., baclofen).
- anticoagulants, medicines used to prevent or treat blood clots (e.g., warfarin such as coumadin).
- anti-retrovirals and anti-virals, medicines used to treat viral infections (e.g., ritonavir or acyclovir).
- anti-fungal drugs, medicines used to treat fungal infections.
- antibiotic drugs, medicines used to treat bacterial infections.
- medicines used to treat heart problems (e.g., beta blockers).
- medicines used to treat migraines (e.g. triptans).
- antiepileptics, medicines used to prevent and control seizures (e.g., phenytoin, or gabapentinoids such as pregabalin).
- cimetidine, a medicine used to treat ulcers.
- grapefruit juice.
- St. John's Wort.

**How to take Meperidine Hydrochloride Injection USP:**

Meperidine Hydrochloride Injection USP is administered by injection. This is given under the skin, into the muscle or into a vein.

**Usual Dose:**

Your dose is tailored/personalized just for you. Your healthcare professional will prescribe the lowest dose that works to control your pain. It is recommended that you only take Meperidine Hydrochloride Injection USP for up to 7 days. If you need to take Meperidine Hydrochloride Injection USP for longer, your healthcare professional will determine the best dose for you to lower the risk of side effects and overdose. Higher doses can lead to more side effects and a greater chance of overdose.

Review your pain regularly with your healthcare professional to determine if you still need Meperidine Hydrochloride Injection USP. Be sure to use Meperidine Hydrochloride Injection USP only for the condition for which it was prescribed.

If your pain increases or you develop any side effect as a result of taking Meperidine Hydrochloride Injection USP, tell your healthcare professional immediately.

Stopping your Medication: If you have been taking Meperidine Hydrochloride Injection USP for more than a few days you should not stop taking it all of a sudden. You should check with your healthcare professional for directions on how to slowly stop taking it. You should do it slowly to avoid uncomfortable symptoms such as having:

- body aches;
- diarrhea;
- goosebumps;
- loss of appetite;
- nausea;
- feeling nervous or restless;
- runny nose;
- sneezing;
- tremors or shivering;
- stomach cramps;
- rapid heart rate (tachycardia);
- having trouble sleeping;
- an unusual increase in sweating;
- heart palpitations;
- an unexplained fever;
- weakness;
- yawning.

By reducing or stopping your opioid treatment, your body will become less used to opioids. If you start treatment again, you will need to start at the lowest dose. You may overdose if you restart at the last dose you took before you slowly stopped taking Meperidine Hydrochloride Injection USP.

**Overdose:**

Signs of overdose may include:

- unusually slow or weak breathing;
- dizziness;
- confusion;
- toxic leukoencephalopathy (a brain disorder affecting the brain's white matter);
- extreme drowsiness.

If you think you, or a person you are caring for, have taken too much Meperidine Hydrochloride Injection USP, contact a healthcare professional, hospital emergency department, or regional Poison Control Centre immediately, even if there are no symptoms.

**Missed Dose:**

If a dose has been missed, tell your healthcare professional as soon as possible. The next dose should be given to you at the next scheduled time and in the normal amount.

**What are possible side effects from using Meperidine Hydrochloride Injection USP?**

These are not all the possible side effects you may feel when taking Meperidine Hydrochloride Injection USP. If you experience any side effects not listed here, contact your healthcare professional.

Side effects may include:

- drowsiness;
- insomnia;
- dizziness;
- fainting;
- nausea, vomiting, or a poor appetite;
- dry mouth;
- headache;
- problems with vision;
- weakness, uncoordinated muscle movement;
- itching;
- sweating;
- constipation. Talk with your healthcare professional about ways to prevent constipation when you start using Meperidine Hydrochloride Injection USP;
- low sex drive, impotence (erectile dysfunction), infertility.

Serious side effects and what to do about them			
Symptom / effect	Talk to your healthcare professional		Stop taking drug and get immediate medical help
	Only if severe	In all cases	
<b>RARE</b>			
<b>Allergic reaction:</b> itchy, red, painful, and irritated or swollen skin (rash), outbreak of pale red bumps or welts on the skin that appear suddenly (hives), swelling of the face, lips, tongue or throat, difficulty swallowing, or difficulty breathing.			√
<b>Bowel blockage (impaction):</b> abdominal pain, severe constipation, or nausea.			√
<b>Fast, slow, or irregular heartbeat:</b> heart palpitations.		√	
<b>Hypotension (low blood pressure):</b> dizziness, fainting, or light-headedness.	√		
<b>Overdose:</b> hallucinations, confusion, inability to walk normally, slow or weak breathing, extreme sleepiness, sedation, dizziness, floppy muscles/low muscle tone, or cold and clammy skin.			√
<b>Respiratory depression:</b> slow, shallow, or weak breathing.			√
<b>Serotonin toxicity (also known as serotonin syndrome):</b> a reaction which may cause feelings of agitation or restlessness, flushing, muscle twitching, involuntary eye movements, heavy sweating, high body temperature (>38°C), or rigid muscles.			√
<b>Withdrawal:</b> nausea, vomiting, diarrhea, anxiety, shivering, cold and clammy skin, body aches, loss of appetite, or sweating.		√	
<b>UNKNOWN FREQUENCY</b>			
<b>Disorder of the adrenal gland:</b> nausea, vomiting, anorexia, fatigue, weakness, dizziness, or low blood pressure.			√
<b>Sleep apnea:</b> stop breathing for short periods during your normal nightly sleep.		√	

If you have a troublesome symptom or side effect that is not listed here or becomes bad enough to interfere with your daily activities, tell your healthcare professional.



## Reporting Side Effects

You can report any suspected side effects associated with the use of health products to Health Canada by:

- Visiting the Web page on Adverse Reaction Reporting (<https://www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/adverse-reaction-reporting.html>) for information on how to report online, by mail or by fax; or
- Calling toll-free at 1-866-234-2345.

*NOTE: Contact your healthcare professional if you need information about how to manage your side effects. The Canada Vigilance Program does not provide medical advice.*

## Storage:

- Store Meperidine Hydrochloride Injection USP at room temperature (15°C to 30°C). Keep in a dry place and protected from light.
- Keep unused or expired Meperidine Hydrochloride Injection USP in a secure place to prevent theft, misuse or accidental exposure.
- Keep Meperidine Hydrochloride Injection USP under lock, out of sight and reach of children and pets.
- Never take medicine in front of small children as they will want to copy you. Accidental exposure by a child is dangerous and may result in death. If a child accidentally takes Meperidine Hydrochloride Injection USP, get emergency help right away.

## If you want more information about Meperidine Hydrochloride Injection USP:

- Talk to your healthcare professional.
- Find the full Product Monograph that is prepared for healthcare professionals and includes this Patient Medication Information by visiting the Health Canada website (<https://www.canada.ca/en/health-canada/services/drugs-health-products/drug-products/drug-product-database.html>); the manufacturer's website <http://www.sandoz.com>, or by calling 1-800-361-3062.

This leaflet was prepared by Sandoz Canada Inc.

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