

## AUSTRALIAN PRODUCT INFORMATION

### SUBLOCADE (BUPRENORPHINE)

#### **WARNINGS:**

##### ***Risk of serious harm or death with intravenous administration***

Serious harm or death could result if administered intravenously. SUBLOCADE forms a solid mass upon contact with body fluids and may cause occlusion, local tissue damage and thrombo-embolic events, including life threatening pulmonary emboli, if administered intravenously. (see section 4.4).

##### ***Hazardous and harmful use***

Although SUBLOCADE is indicated for the treatment of opioid dependence it still poses risks of hazardous and harmful use which can lead to overdose and death. Monitor the patient's ongoing risk of hazardous and harmful use regularly during opioid substitution therapy with SUBLOCADE (see section 4.4. Special Warnings and Precautions for Use).

##### ***Life threatening respiratory depression***

Serious, life-threatening or fatal respiratory depression may occur with the use of SUBLOCADE. Be aware of situations which increase the risk of respiratory depression, and monitor patients closely, especially on initiation or following a dose increase (see section 4.4 Special Warnings and Precautions for Use).

##### ***Concomitant use of benzodiazepines and other central nervous system (CNS) depressants, including alcohol***

Concomitant use of opioids with benzodiazepines, gabapentinoids, antihistamines, tricyclic antidepressants, antipsychotics, cannabis or other central nervous system (CNS) depressants, including alcohol, may result in profound sedation, respiratory depression, coma, and death. Patients and their caregivers should be made aware of the symptoms of respiratory depression. Patients and their caregivers should also be informed of the potential harms of consuming alcohol while receiving SUBLOCADE

## **1 NAME OF THE MEDICINE**

SUBLOCADE 100 mg/0.5 mL buprenorphine modified release solution for injection.

SUBLOCADE 300 mg/1.5 mL buprenorphine modified release solution for injection.

## **2 QUALITATIVE AND QUANTITATIVE COMPOSITION**

Buprenorphine is dissolved in the ATRIGEL® Delivery System at 18% by weight.

0.5 mL modified release injection solution in a prefilled syringe contains 100 mg buprenorphine (as buprenorphine base).

1.5 mL modified release injection solution in a prefilled syringe contains 300 mg buprenorphine (as buprenorphine base).

Buprenorphine is a white to cream, crystalline powder, very slightly soluble in water (<1 mg/mL).

Chemically, buprenorphine is (2S)-2-[17-(Cyclopropylmethyl)-4,5 $\alpha$ -epoxy-3-hydroxy-6-methoxy-6 $\alpha$ ,14-ethano-14 $\alpha$ -morphinan-7 $\alpha$ -yl]-3,3-dimethylbutan-2-ol.

Buprenorphine has the molecular formula C<sub>29</sub>H<sub>41</sub>NO<sub>4</sub> and the molecular weight is 467.6.

For the full list of excipients, see section 6.1 List of excipients.

## **3 PHARMACEUTICAL FORM**

SUBLOCADE is a modified release solution for injection.

SUBLOCADE is a clear colourless to yellow to amber sterile solution for **subcutaneous injection only**. It forms a depot upon administration which is designed to deliver buprenorphine at a controlled rate over a one-month period.

## **4 CLINICAL PARTICULARS**

### **4.1 THERAPEUTIC INDICATIONS**

SUBLOCADE is indicated for maintenance treatment of opioid dependence, within a framework of medical, social and psychological treatment.

### **4.2 DOSE AND METHOD OF ADMINISTRATION**

Patients appropriate for SUBLOCADE are adults who have undergone induction on a transmucosal buprenorphine-containing product. Withdrawal signs and symptoms should be suppressed (COWS  $\leq 12$ ) before transitioning to SUBLOCADE.

Dosing and induction of buprenorphine-containing products should be based on instructions in their Product Information.

**FOR ABDOMINAL SUBCUTANEOUS INJECTION ONLY. DO NOT ADMINISTER SUBLOCADE INTRAVENOUSLY OR INTRAMUSCULARLY** (see section 4.4 Special Warnings and Precautions for Use).

- Only healthcare providers should prepare and administer SUBLOCADE.
- Administer SUBLOCADE monthly with a minimum of 26 days between doses.
- Initiating treatment with SUBLOCADE as the first buprenorphine product has not been studied. Initiate SUBLOCADE treatment only following induction and dose adjustment with a transmucosal buprenorphine containing product.
- Administer each injection only using the syringe and safety needle included with the product.
- Do not administer part of a dose.

#### ***Precautions to be taken before starting treatment***

Baseline liver function tests and documentation of viral hepatitis status are recommended prior to commencing therapy. Patients who are positive for viral hepatitis, on concomitant medicinal products (see section 4.5 INTERACTIONS WITH OTHER MEDICINES AND OTHER FORMS OF INTERACTIONS) and/or who have existing liver dysfunction are at greater risk of liver injury. Regular monitoring of the liver function is recommended.

#### ***Recommended dosing***

Patients appropriate for SUBLOCADE are adults who have initiated and stabilised treatment on a transmucosal buprenorphine-containing product, delivering the equivalent of at least 8 mg/day of buprenorphine for at least 7 days. Transferring patients stabilised on doses over 24 mg buprenorphine to SUBLOCADE has not been studied in clinical trials. The patient may only be transitioned to SUBLOCADE after stabilisation on transmucosal buprenorphine (see Section 5.1 Pharmacodynamic Properties – Clinical trials).

The recommended dose of SUBLOCADE is 300 mg monthly for the first two months. The recommended maintenance dose is 100 mg monthly. In clinical trials, randomisation to the 300 mg/month maintenance dose did not provide additional efficacy as compared to randomisation to the 100 mg/month maintenance dose and the 300 mg/month maintenance dose was associated with a higher incidence of adverse events and study discontinuations. However, patients who do not show a satisfactory clinical response following the second dose can receive a maintenance dose of 300 mg monthly.

Buprenorphine plasma levels in the month following the second 300 mg dose are maintained with 100 mg maintenance dosing. The 300 mg maintenance dose achieves higher levels and reaches steady state after the fourth monthly injection (see section 5.2 Pharmacokinetic Properties).

A patient who misses a dose should receive the next dose as soon as possible, with the following dose given no less than 26 days later. Occasional delays in dosing up to 2 weeks are not expected to have a clinically significant impact on treatment effect.

### ***Clinical supervision***

Periodic assessment is necessary to determine effectiveness of the treatment plan and overall patient progress. When evaluating the patient, examine the injection site for signs of infection or evidence of tampering or attempts to remove the depot.

Due to the chronic nature of opioid use disorder, the need for continuing medication-assisted treatment should be re-evaluated periodically. There is no maximum recommended duration of maintenance treatment. For some patients, treatment may continue indefinitely. If considering stopping treatment, the clinical status of the patient should be considered.

If SUBLOCADE is discontinued, its modified-release characteristics should be considered and the patient should be monitored for several months for signs and symptoms of withdrawal or buprenorphine effects and treated appropriately. After steady-state has been achieved (4-6 months), patients discontinuing SUBLOCADE may have detectable plasma levels of buprenorphine for twelve months or longer. The correlation between plasma concentrations of buprenorphine and those detectable in urine is not known.

## **INSTRUCTIONS FOR USE**

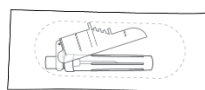
### **IMPORTANT INFORMATION:**

- For abdominal subcutaneous injection only.
- **To be administered by a healthcare professional only.**
- Please read the instructions carefully before handling the product.
- Remove SUBLOCADE from the refrigerator prior to administration. The product requires at least 15 minutes to reach room temperature. Do not open the foil pouch until the patient has arrived for his or her injection.
- Product is for single use in one patient only. Discard any residue.
- Discard SUBLOCADE if left at room temperature (below 25°C) for longer than 28 days.
- Do not attach the needle until time of administration.

### **STEP 1: GETTING READY**

Remove the foil pouch and safety needle from the carton. Open the pouch and remove the syringe. Discard the oxygen absorber pack. It is not needed.

**Figure 1**

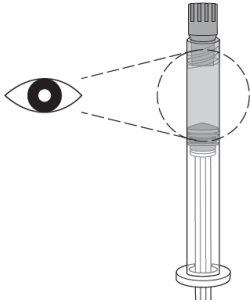


## STEP 2: CHECK THE LIQUID CLARITY

Check that the medication is free of particulate matter and discolouration. SUBLOCADE can range from clear colourless to yellow to amber. **Variations of colour within this range do not affect the potency of the product.**

If the medication is discoloured or contains particulate matter it should not be used.

Figure 2

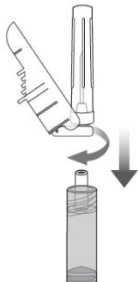


## STEP 3: ATTACH THE SAFETY NEEDLE

Remove the cap from the syringe and the safety needle supplied in the carton from its sterile package. Gently twist the needle clockwise until it is tight and firmly attached.

Do not remove the plastic cover from the needle.

Figure 3



## STEP 4: PREPARE THE ABDOMINAL INJECTION SITE

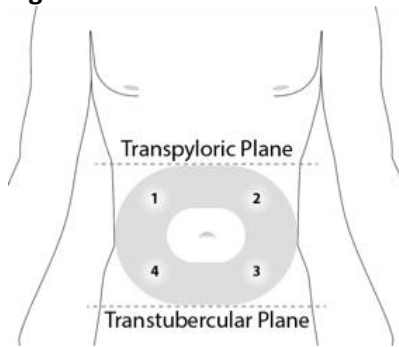
Choose an injection site on the abdomen between the transpyloric and transtuberular planes with adequate subcutaneous tissue that is free of skin conditions (e.g. nodules, lesions, excessive pigment). It is recommended that the patient is in the supine position.

Do not inject into an area where the skin is irritated, reddened, bruised, infected or scarred in any way.

Clean the injection site well with an alcohol swab.

To avoid irritation, rotate injection sites following a pattern similar to the illustration in Figure 4. Record the location of the injection to ensure that a different site is used at the time of the next injection.

**Figure 4**



**STEP 5: REMOVE EXCESS AIR FROM SYRINGE**

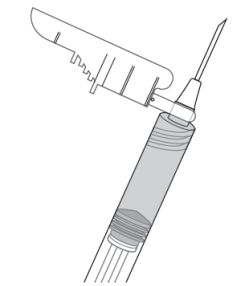
Hold the syringe upright for several seconds to allow air bubbles to rise. Due to the viscous nature of the medication, bubbles will not rise as quickly as those in an aqueous solution.

Remove needle cover and slowly depress the plunger to push out the excess air from the syringe.

- Small bubbles may remain in the medication. Large air gaps, however, can be minimised by pulling back on the plunger rod to pop air bubbles prior to expelling the air very slowly. Air should be expelled very carefully to avoid loss of medication.

If medication is seen at the needle tip, pull back slightly on the plunger to prevent medication spillage.

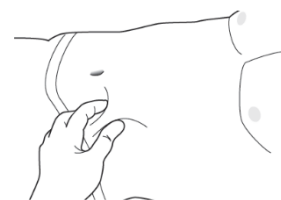
**Figure 5**



**STEP 6: PINCH THE INJECTION SITE**

Pinch the skin around the injection area. Be sure to pinch enough skin to accommodate the size of the needle. Lift the adipose tissue from the underlying muscle to prevent accidental intramuscular injection.

**Figure 6**



**STEP 7: INJECT THE MEDICATION**

SUBLOCADE is for subcutaneous injection only. Do not inject intravenously or intramuscularly (see Section 4.4 Special Warnings and Precautions for Use).

Insert needle fully into the abdominal subcutaneous tissue. The actual angle of injection will depend on the amount of subcutaneous tissue.

Use a slow, steady push to inject the medication. Continue pushing until all of the medication is given.

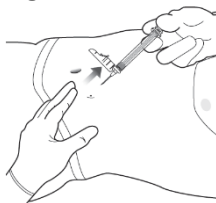
**Figure 7**



**STEP 8: WITHDRAW THE NEEDLE**

Withdraw the needle at the same angle used for insertion and release the pinched skin. Do not rub the injection area after the injection. If there is bleeding, apply a gauze pad or bandage but use minimal pressure.

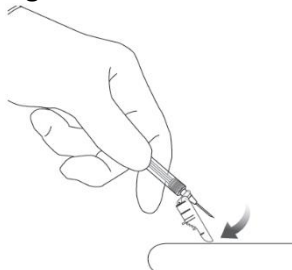
**Figure 8**



**STEP 9: LOCK THE NEEDLE GUARD AND DISCARD THE SYRINGE**

Lock the needle guard into place by pushing it against a hard surface such as a table (**Figure 9**). Dispose of all syringe components in a secure sharps disposal container.

**Figure 9**



**STEP 10: INSTRUCT THE PATIENT**

Advise the patient that they may have a lump for several weeks that will decrease in size over time. Instruct the patient not to rub or massage the injection site and to be aware of the placement of any belts or clothing waistbands.

***Removal of the Depot***

In the event the depot must be removed, it can be surgically excised by a healthcare professional under local anaesthesia within 14 days of injection. The removed depot should be disposed of carefully. Patients who have the depot removed should be monitored for signs and symptoms of withdrawal and treated appropriately.

**4.3 CONTRAINDICATIONS**

Hypersensitivity to buprenorphine or any other component of the ATRIGEL® Delivery System.

Severe hepatic insufficiency (Child -Pugh C).  
Subjects less than 18 years of age.  
Severe respiratory insufficiency.  
Acute intoxication with alcohol or other CNS depressants.

#### **4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE**

##### **Risk of serious harm or death with intravenous administration**

Intravenous injection presents significant risk of serious harm or death as SUBLOCADE forms a solid mass upon contact with body fluids. Occlusion, local tissue damage, and thrombo-embolic events, including life threatening pulmonary emboli, could result if administered intravenously. Do not administer intravenously or intramuscularly.

##### **General**

SUBLOCADE should be administered with caution in debilitated patients and those with severe impairment of hepatic, pulmonary, or renal function; myxoedema or hypothyroidism, adrenal cortical insufficiency (e.g. Addison's disease); CNS depression or coma; toxic psychoses; acute alcoholism; or delirium tremens.

Buprenorphine increases intracholedochal pressure as do other opioids. Therefore, caution should be exercised when buprenorphine is to be administered to patients with dysfunction of the biliary tract.

As with other opioids, caution is advised in patients using buprenorphine and having hypotension, prostatic hypertrophy or urethral stenosis.

Opioids may produce orthostatic hypotension in ambulatory patients.

As with other mu-opioid receptor agonists, the administration of SUBLOCADE may obscure the diagnosis or clinical course of patients with acute abdominal conditions.

##### **Misuse, abuse and diversion**

Although SUBLOCADE is indicated for the treatment of opioid dependence it still poses risks of hazardous and harmful use which can lead to overdose and death. Monitor the patient's ongoing risk of hazardous and harmful use regularly during opioid substitution therapy with SUBLOCADE.

Buprenorphine can be misused or abused in a manner similar to other opioids, legal or illicit. Some risks of misuse and abuse include overdose, spread of blood borne viral infections, respiratory depression and hepatic injury. SUBLOCADE misuse by someone other than the intended patient poses the additional risk of new opioid dependent individuals using buprenorphine as the primary opioid of abuse and may occur if the medicine is distributed for illicit use directly by the intended patient or if the medicine is not safeguarded against theft. Sub-optimal treatment with buprenorphine may prompt medication misuse by the patient, leading to overdose or treatment dropout. A patient who is under-dosed with buprenorphine may continue responding to uncontrolled withdrawal symptoms by self-medicating with opioids, alcohol or other sedative-hypnotics such as benzodiazepines. To minimise the risk of misuse, abuse and diversion, appropriate precautions should be taken when prescribing and patient follow-up visits with clinical monitoring appropriate to the patient's level of stability should be conducted.

SUBLOCADE is injected as a liquid and the subsequent precipitation of the poly (D,L-lactide-co-glycolide) polymer creates a depot which contains buprenorphine. The entire contents of the prefilled syringe should be administered. After administration, a small amount (approximately 0.1 mL) of SUBLOCADE will remain in the needle and syringe and should be properly disposed of.

After initial formation of the depot, buprenorphine is released via diffusion from, and the biodegradation of, the depot. Clinical monitoring for evidence at the injection site of tampering or attempting to remove the depot should be ongoing throughout treatment. No accounts of subjects removing or attempting to remove the depot after SUBLOCADE administration were reported in clinical studies.

Intravenous injection presents significant risk of serious harm or death as SUBLOCADE forms a mass upon contact with body fluids. Intramuscular injection presents risk of tissue damage.

#### *Abuse Deterrence Studies*

SUBLOCADE has physicochemical properties designed for modified-release after subcutaneous injection. These properties make both SUBLOCADE and excised depot difficult to misuse and abuse. To evaluate the ability of these physicochemical properties to reduce the potential for abuse of SUBLOCADE, a series of *in vitro* laboratory studies were conducted.

#### *In Vitro Testing*

Results of *in vitro* testing suggest that it would be difficult to prepare a powder from either SUBLOCADE or the excised depot.

Attempts to abuse either SUBLOCADE or the excised depots via intravenous injection would result in serious harm.

#### **Risk of Respiratory and Central Nervous System (CNS) Depression**

Serious, life-threatening or fatal respiratory depression may occur with the use of SUBLOCADE. Be aware of situations which increase the risk of respiratory depression and monitor patients closely, especially on initiation or following a dose increase.

Buprenorphine has been associated with life-threatening respiratory depression and death. Many, but not all, post-marketing reports regarding coma and death involved misuse by self-injection or were associated with the concomitant use of buprenorphine and benzodiazepines or other CNS depressants including alcohol. Warn patients of the potential danger of self-administration of benzodiazepines or other CNS depressants at the same time as receiving SUBLOCADE.

In the event of depression of respiratory or cardiac function, see Section 4.9 Overdose.

SUBLOCADE may cause severe, possibly fatal, respiratory depression in children. Protect children against exposure. SUBLOCADE should be used with caution in patients with compromised respiratory function (e.g. chronic obstructive pulmonary disease, asthma, cor pulmonale, decreased respiratory reserve, hypoxia, hypercapnia, or pre-existing respiratory depression or kyphoscoliosis).

Due to its modified-release characteristics, if SUBLOCADE is discontinued as a result of compromised respiratory function monitor patients for ongoing buprenorphine effects for several months.

Concomitant use of opioids with benzodiazepines, gabapentinoids, antihistamines, tricyclic antidepressants, antipsychotics, cannabis or other central nervous system (CNS) depressants, including alcohol, may result in profound sedation, respiratory depression, coma, and death (see section 4.5 Interactions with other medicines and other forms of interaction). Patients and their caregivers should be made aware of the symptoms of respiratory depression. Patients and their caregivers should also be informed of the potential harms of consuming alcohol while receiving SUBLOCADE.



### **Head Injury and Increased Intracranial Pressure**

Buprenorphine, like other potent opioids, may elevate cerebrospinal fluid pressure and should be used with caution in patients with head injury, intracranial lesions and other circumstances where cerebrospinal pressure may be increased, or history of seizure. Buprenorphine can produce miosis and changes in the level of consciousness, or changes in the perception of pain as a symptom of disease may interfere with patient evaluation or obscure the diagnosis or clinical course of concomitant disease.

### **Dependence and Risk of Opioid Withdrawal**

Buprenorphine is a partial agonist at the  $\mu$  (mu)-opiate receptor and studies in animals, as well as clinical experience, have shown that buprenorphine may produce dependence but at a lower level than a full agonist (e.g. morphine).

Withdrawal signs and symptoms were not observed in the month following discontinuation of SUBLOCADE. Considering the long half-life, any withdrawal signs and symptoms that may occur would be expected to be delayed. Model simulations indicate that steady-state buprenorphine plasma concentrations decreased slowly over time following the last injection and remained at therapeutic levels for 2 to 5 months on average, depending on the dosage administered (100 or 300 mg, respectively).

Patients who elect to discontinue treatment with SUBLOCADE should be monitored for withdrawal signs and symptoms. Consider transmucosal buprenorphine if needed to treat withdrawal after discontinuing SUBLOCADE.

### **Neonatal Abstinence Syndrome**

Chronic use of buprenorphine by the mother at the end of pregnancy may result in a withdrawal syndrome (e.g. hypertonia, neonatal tremor, neonatal agitation, myoclonus, convulsions, apnoea or bradycardia) in the neonate. In many reported cases the withdrawal was serious and required treatment. The syndrome is generally delayed for several hours to several days after birth (see *Use in Pregnancy*). Due to the long half-life of buprenorphine, neonatal monitoring for several days should be considered at the end of pregnancy to prevent the risk of respiratory depression or withdrawal syndrome in neonates.

### **Allergic Reactions**

Cases of acute and chronic hypersensitivity to buprenorphine have been reported both in clinical trials and in the post-marketing experience. The most common signs and symptoms include rashes, hives, and pruritus. Cases of bronchospasm, angioneurotic oedema, and anaphylactic shock have been reported. A history of hypersensitivity to buprenorphine is a contraindication to SUBLOCADE.

### **Use in Opioid Naïve Patients**

There have been reported deaths of opioid naïve individuals who received doses as low as 2 mg of buprenorphine sublingual tablet for analgesia. SUBLOCADE is not appropriate as an analgesic.

### **Hepatitis, Hepatic Events**

Cases of acute hepatic injury have been reported in opioid-dependent patients, both in clinical trials and post-marketing adverse reaction reports. The spectrum of abnormalities ranges from transient asymptomatic elevations in hepatic transaminases to case reports of cytolytic hepatitis, hepatic failure, hepatic necrosis, hepatorenal syndrome, and hepatic encephalopathy and death. Serious cases of acute hepatic injury have also been reported in a context of misuse, especially by the intravenous route. These hepatic injuries were dose-related and could be due to mitochondrial toxicity. Pre-existing or acquired mitochondrial impairment (genetic diseases, viral infections particularly chronic hepatitis C, liver enzyme abnormalities, alcohol abuse, anorexia, associated mitochondrial toxins, e.g. aspirin, isoniazid, valproate, amiodarone, antiviral nucleoside analogues, or drug misuse by injection) could promote the occurrence of such hepatic injuries.

These co-factors must be taken into account before prescribing SUBLOCADE and during treatment monitoring. Baseline liver function tests and documentation of viral hepatitis status are recommended prior to commencing therapy. Patients who are positive for viral hepatitis, on concomitant medicines (see section 4.5 Interactions) and/or have existing liver dysfunction are at greater risk of liver injury. Regular monitoring of liver function is recommended. A biological and etiological evaluation is recommended when a hepatic event is suspected. Depending upon the findings, the medicine may be discontinued. If treatment is continued, hepatic function should be monitored closely.

#### Use in hepatic impairment

Buprenorphine is extensively metabolised by the liver. The effects of hepatic impairment on the pharmacokinetics of buprenorphine were evaluated in a post-marketing study, in which a Suboxone 2.0/0.5mg (buprenorphine/naloxone) sublingual tablet was administered to healthy subjects and subjects with varying degrees of hepatic impairment. Plasma levels were found to be elevated for buprenorphine in patients with moderate to severe hepatic impairment (Table 1). Buprenorphine plasma exposure increased approximately 3-fold in patients with severely impaired hepatic function.

**Table 1: Effect of hepatic impairment on pharmacokinetic parameters of buprenorphine following buprenorphine/naloxone administration (change relative to healthy subjects)**

PK parameter	Mild Hepatic Impairment (Child-Pugh Class A) (n=9)	Moderate Hepatic Impairment (Child-Pugh Class B) (n=8)	Severe Hepatic Impairment (Child-Pugh Class C) (n=8)
<b>BUPRENORPHINE</b>			
<b>C<sub>max</sub></b>	<b>1.2 fold increase</b>	<b>1.1 fold increase</b>	<b>1.7 fold increase</b>
<b>AUC<sub>last</sub></b>	<b>Similar to control</b>	<b>1.6 fold increase</b>	<b>2.8 fold increase</b>

In the same study, changes in C<sub>max</sub> and AUC<sub>last</sub> in subjects with HCV infection without hepatic impairment were not clinically significant in comparison to the healthy subjects.

The effect of hepatic impairment on the pharmacokinetics of SUBLOCADE has not been studied. Because of the long-acting nature of the product, adjustments to dosages of SUBLOCADE are not rapidly reflected in plasma buprenorphine levels. Because buprenorphine levels cannot be rapidly decreased, patients with pre-existing severe hepatic impairment are not candidates for treatment with SUBLOCADE.

Patients who develop moderate to severe hepatic impairment while being treated with SUBLOCADE should be monitored for several months for signs and symptoms of toxicity or overdose caused by increased levels of buprenorphine.

#### Use in renal impairment

Renal elimination plays a relatively small role (~30%) in the overall clearance of buprenorphine and metabolites. Therefore, no dose modification based on renal function is generally required. Metabolites of buprenorphine accumulate in patients with renal failure. Caution is recommended when dosing patients with severe renal impairment (CL<sub>cr</sub> <30 mL/min), which may require dose adjustment.

Clinical studies of SUBLOCADE did not include subjects with renal impairment.

#### Use in Patients at Risk for Arrhythmia

Serial ECGs were collected following a single dose and at steady-state to evaluate the effect of SUBLOCADE on the QT interval in five clinical studies including the Phase 3 study. In a Phase 3 study, seven patients had an increase from baseline QTc greater than 60 msec at any time [2/203 patients

(1.0%) in the 300 mg/100 mg group and 5/201 patients (2.0%) in the 300 mg/300 mg group] and one patient in the 300 mg/300 mg group was found to have a QTc greater than 500 msec. These QTc findings were all sporadic and transient and none led to aberrant ventricular rhythm. Review of ECG and adverse event data provided no evidence for syncope, seizure, or ventricular tachycardia or fibrillation.

Consider these observations in clinical decisions when prescribing buprenorphine to patients with hypokalemia, hypomagnesemia, or clinically unstable cardiac disease, including unstable atrial fibrillation, symptomatic bradycardia, unstable congestive heart failure, or active myocardial ischemia. Periodic electrocardiographic (ECG) monitoring is recommended in these patients. Avoid the use of buprenorphine in patients with a history of Long QT Syndrome or an immediate family member with this condition or those taking Class IA antiarrhythmic medications (e.g. quinidine, procainamide, disopyramide) or Class III antiarrhythmic medications (e.g., sotalol, amiodarone, dofetilide), or other medications that prolong the QT interval.

#### **Use in the elderly**

The safety and efficacy of buprenorphine in elderly patients over 65 years have not been established.

#### **Risks associated with Treatment of Emergent Acute Pain**

While on SUBLOCADE, situations may arise where patients need acute pain management, or may require anaesthesia. Treat patients receiving SUBLOCADE with a non-opioid analgesic whenever possible. Patients requiring opioid therapy for analgesia may be treated with a high-affinity full opioid analgesic under the supervision of a physician, with particular attention to respiratory function. Higher doses may be required for analgesic effect. Therefore, a higher potential for toxicity exists with opioid administration.

If sedation or opioid therapy is required, e.g. as part of anaesthesia, patients should be continuously monitored in an anaesthesia care setting by persons not involved in the conduct of the surgical or diagnostic procedure. The sedation or opioid therapy should be provided by individuals specifically trained in the use of anaesthetic drugs and the management of the respiratory effects of potent opioids, specifically the establishment and maintenance of a patent airway and assisted ventilation. Advise patients of the importance of instructing their family members, in the event of emergency, to inform the treating healthcare provider or emergency room staff that the patient is being treated with SUBLOCADE.

The above guidance should also be considered for any patient who has been treated with SUBLOCADE within the last 6 months.

#### **Paediatric use**

SUBLOCADE is not recommended for use in children. The safety and effectiveness of SUBLOCADE in subjects below the age of 18 has not been established.

#### **Effects on laboratory tests**

Athletes should be aware that this medicine may cause a positive reaction to “anti-doping” tests.

## **4.5 INTERACTIONS WITH OTHER MEDICINES AND OTHER FORMS OF INTERACTIONS**

The table below includes clinically significant drug interactions with SUBLOCADE.

**Table 2 - Clinically Significant Drug Interactions**

<b>Benzodiazepines and other Central Nervous System depressants</b>	
<i>Examples</i>	Alcohol, Benzodiazepines, Non-benzodiazepine sedatives, hypnotics, anxiolytics, tranquilizers, muscle relaxants, general anaesthetics, antipsychotics, gabapentinoids, cannabis, other opioids (e.g. methadone, analgesics, and antitussives), antihistamines (e.g. sedating H1-receptor antagonists), clonidine (see section 4.4 Special Warnings and Precautions for Use).
<i>Clinical Impact:</i>	Due to additive pharmacologic effects, the concomitant use of benzodiazepines or other CNS depressants, including alcohol, increases the risk of respiratory depression, profound sedation, coma, and death.
<i>Intervention</i>	<p>Cessation of benzodiazepines or other CNS depressants is preferred in most cases of concomitant use. In some cases, monitoring in a higher level of care for taper may be appropriate. In others, gradually tapering a patient off a prescribed benzodiazepine or other CNS depressant or decreasing to the lowest effective dose may be appropriate. Similarly, cessation of other CNS depressants is preferred when possible.</p> <p>Before co-prescribing benzodiazepines for anxiety or insomnia, ensure that patients are appropriately diagnosed and consider alternative medications and non-pharmacologic treatments.</p> <p>This combination with benzodiazepines may result in death due to respiratory depression of central origin; therefore, patients must be closely monitored when prescribed this combination, and this combination should be avoided in cases where there is a risk of misuse. Patients should be warned that it is extremely dangerous to self-administer non-prescribed benzodiazepines while taking this product and should also be cautioned to use benzodiazepines concurrently with this product only as prescribed.</p> <p>Use caution with medicines containing alcohol.</p>
<b>Other Opioid Analgesics</b>	
<i>Clinical Impact:</i>	The analgesic properties of other opioids may be reduced in patients receiving treatment with buprenorphine for opioid dependence. Adequate analgesia may be difficult to achieve when administering a full opioid agonist in patients receiving buprenorphine. Conversely, the potential for overdose should be considered with higher than usual doses of full agonist opioids, such as methadone or level III analgesics, especially when attempting to overcome buprenorphine partial agonist effects, or when buprenorphine plasma levels are declining.
<i>Intervention</i>	Patients with a need for analgesia and opioid dependence treatment may be best managed by multidisciplinary teams that include both pain and opioid dependence treatment specialists (see Section 4.4 Special Warnings and Precautions for Use).
<b>Naltrexone and other opioid antagonists</b>	
<i>Clinical Impact:</i>	Since buprenorphine is a partial mu-opioid agonist, concomitantly administered opioid antagonists such as naltrexone can reduce or completely block the effects of SUBLOCADE. Patients maintained on buprenorphine may experience a sudden onset of prolonged and

	intense opioid withdrawal symptoms if dosed with opioid antagonists that achieve pharmacologically relevant systemic concentrations.
<b>CYP3A4 inhibitors</b>	
<i>Examples</i>	Protease inhibitors (like ritonavir, saquinavir or indinavir), azole antifungals like ketoconazole or itraconazole, calcium channel antagonists and macrolide antibiotics like erythromycin.
<i>Clinical Impact:</i>	<p>The effects of co-administered CYP3A4 inhibitors on buprenorphine exposure in subjects treated with SUBLOCADE have not been studied and the effects may be dependent on the route of administration; however, such interactions have been established in studies using transmucosal buprenorphine. Buprenorphine is metabolized to norbuprenorphine primarily by CYP3A4, therefore potential interactions may occur when SUBLOCADE is given concurrently with agents that affect CYP3A4 activity.</p> <p>The concomitant use of sublingual buprenorphine and CYP3A4 inhibitors can increase the plasma concentration of buprenorphine, resulting in increased or prolonged opioid effects.</p>
<i>Intervention:</i>	<p>Patients who transfer to SUBLOCADE treatment from a regimen of transmucosal buprenorphine used concomitantly with CYP3A4 inhibitors should be monitored to ensure that the plasma buprenorphine level provided by SUBLOCADE is adequate. If patients already on SUBLOCADE require newly-initiated treatment with CYP3A4 inhibitors, patients should be monitored for signs and symptoms of over-medication. Within 2 weeks of SUBLOCADE administration, if signs and symptoms of buprenorphine toxicity or overdose occur but the concomitant medication cannot be reduced or discontinued, it may be necessary to remove the depot and treat the patient with a formulation of buprenorphine that permits dose adjustments. Conversely, if a patient has been stabilised on SUBLOCADE in the setting of concomitant medication that is a CYP3A4 inhibitor, and the concomitant medication is discontinued, the patient should be monitored for withdrawal. If the dose of SUBLOCADE is not adequate in the absence of the concomitant medication, that patient should be transitioned back to a formulation of buprenorphine that permits dose adjustments.</p>
<b>CYP3A4 inducers</b>	
<i>Examples</i>	Rifampicin, phenobarbital, carbamazepine, phenytoin.
<i>Clinical Impact:</i>	<p>The effects of co-administered CYP3A4 inducers on buprenorphine exposure in subjects treated with SUBLOCADE have not been studied. Buprenorphine is metabolized to norbuprenorphine primarily by CYP3A4; therefore, potential interactions may occur when SUBLOCADE is given concurrently with agents that affect CYP3A4 activity.</p> <p>CYP3A4 inducers may induce the metabolism of buprenorphine and, therefore, may cause increased clearance of the drug which could lead to a decrease in buprenorphine plasma concentrations, lack of efficacy or, possibly, development of an abstinence syndrome.</p>
<i>Intervention:</i>	<p>Patients who transfer to SUBLOCADE treatment from a regimen of transmucosal buprenorphine used concomitantly with CYP3A4 inducers should be monitored to ensure that the plasma</p>

	buprenorphine level provided by SUBLOCADE is adequate. If patients already on SUBLOCADE require newly-initiated treatment with CYP3A4 inducers, the patients should be monitored for withdrawal. If the dose of SUBLOCADE is not adequate and the concomitant medication cannot be reduced or discontinued, that patient should be transitioned back to a formulation of buprenorphine that permits dose adjustments. Conversely, if a patient has been stabilised on SUBLOCADE in the setting of concomitant medication that is a CYP3A4 inducer, and the concomitant medication is discontinued, the patient should be monitored for signs and symptoms of over-medication. Within 2 weeks of SUBLOCADE administration, if the dose provided by SUBLOCADE is excessive in the absence of the concomitant inducer, it may be necessary to remove SUBLOCADE and treat the patient with a formulation of buprenorphine that permits dose adjustments.
<b>Antiretrovirals: Non-nucleoside reverse transcriptase inhibitors (NNRTIs)</b>	
<i>Examples</i>	Efavirenz, nevirapine, etravirine, delavirdine
<i>Clinical Impact:</i>	Non-nucleoside reverse transcriptase inhibitors (NNRTIs) are metabolized principally by CYP3A4. Efavirenz, nevirapine, and etravirine are known CYP3A inducers, whereas delavirdine is a CYP3A inhibitor. Significant pharmacokinetic interactions between NNRTIs (e.g. efavirenz and delavirdine) and sublingual buprenorphine have been shown in clinical studies, but these pharmacokinetic interactions did not result in any significant pharmacodynamic effects.
<i>Intervention:</i>	Patients who are on chronic treatment with SUBLOCADE should be monitored for increase or decrease in therapeutic effects if NNRTIs are added to their treatment regimen.
<b>Antiretrovirals: Protease inhibitors (PIs)</b>	
<i>Examples:</i>	Atazanavir, ritonavir
<i>Clinical Impact:</i>	Studies have shown some antiretroviral protease inhibitors (PIs) with CYP3A4 inhibitory activity (lopinavir/ritonavir, ritonavir) have little effect on sublingual buprenorphine pharmacokinetic and no significant pharmacodynamic effects. Other PIs with CYP3A4 inhibitory activity (atazanavir and atazanavir/ritonavir) resulted in elevated levels of buprenorphine and norbuprenorphine after sublingual administration, and patients in one study reported increased sedation. Symptoms of opioid excess have been found in post-marketing reports of patients receiving sublingual buprenorphine and atazanavir with and without ritonavir concomitantly.
<i>Intervention:</i>	If treatment with atazanavir with and without ritonavir must be initiated in a patient already treated with SUBLOCADE, the patient should be monitored for signs and symptoms of over-medication. It may be necessary to remove the depot and treat the patient with a sublingual buprenorphine product that permits rapid dose adjustments.

## 4.6 FERTILITY, PREGNANCY AND LACTATION

### Effects on fertility

In a fertility study in rats, female mating, fertility, and fecundity indices were unaffected by the SC administration of SUBLOCADE up to approximately 38 times the maximum recommended human dose (MRHD) of 300 mg on an AUC basis. However, higher mean post-implantation loss was observed

with SUBLOCADE at 38 times the maximum recommended human dose of buprenorphine and at an equivalent level of ATRIGEL® alone, which correlated with higher mean number of resorptions and reduced mean number of viable fetuses/litter size. Mean gravid uterine weight and mean final body weight were lower and correlated with higher mean number of resorptions and lower fetal body weights. The NOAEL (No Observed Adverse Effect Level) for female fertility was approximately 25 times the MRHD for buprenorphine (AUC).

Male fertility and reproduction indices were lower as evidenced by abnormal sperm parameters (low motility, low mean number of sperm and higher percentage of abnormal sperm) with SUBLOCADE at 600 mg/kg and with an equivalent level of ATRIGEL®. The NOAEL for male fertility parameters, including sperm analysis, and male-mediated developmental parameters was approximately 32 times the MRHD on an AUC basis.

In a fertility study in male and female rats, there were no adverse effects on mating, fertility, and fecundity indices when N-methyl-2-pyrrolidone (NMP) an excipient in SUBLOCADE, was administered SC at up to 288 mg/kg/day. NMP was administered daily in this study (compared with the proposed clinical monthly dosing) to ensure reproductive tissue exposure throughout the critical periods of development. The NOAEL for NMP corresponded to a daily human exposure of SUBLOCADE 3-fold higher than the MRHD, based on body surface area.

#### **Use in pregnancy (Category C)**

In an embryofetal development study in rats, SUBLOCADE administered subcutaneously to pregnant animals before mating and again on GD 7 during the period of organogenesis resulted in increased post-implantation loss, which correlated with higher mean number of resorptions and decreased number of viable fetuses per litter, and decreased mean fetal body weights at 900 mg/kg (approximately 38 times the MRHD of 300 mg of SUBLOCADE on an AUC basis); however, similar effects were observed with an equivalent level of ATRIGEL® delivery system alone, indicating they may be attributable to the vehicle. Dose-related increases in incidences of skeletal malformations of the head and visceral malformations were observed with SUBLOCADE with significant changes at 900 mg/kg (approximately 38 times the MRHD on an AUC basis). Similar effects were observed with equivalent levels of ATRIGEL® delivery system. Based on these results, the NOAEL for developmental toxicity was 300 mg/kg, or approximately 15 times the MRHD for buprenorphine (on an AUC basis).

In a separate embryofetal study, daily subcutaneous administration of NMP to pregnant rats during the period of organogenesis at doses greater than 86 mg/kg/day (corresponding to daily administration of SUBLOCADE at 0.9 times the MRHD, based on body surface area) was associated with reduced fetal body weight, but there were no teratogenic effects observed at NMP doses of up to 370 mg/kg/day, nor was any maternal toxicity observed. NMP was administered daily in this study (compared with the proposed clinical monthly dosing) to ensure reproductive tissue exposure throughout the critical periods of development. The NOAEL for fetal developmental effects corresponded to a daily human exposure to NMP 4-fold higher than the MRHD for SUBLOCADE, based on body surface area.

In an embryofetal development study in rabbits, administration of a single subcutaneous injection of SUBLOCADE to pregnant animals on Gestation Day 7 during the period of organogenesis resulted in an increased litter incidence of skeletal malformations at 155 mg/kg (approximately 6 times the MRHD on an AUC basis). There was also an increased litter incidence of external malformations, visceral, and skeletal malformations and variations at 390 mg/kg SUBLOCADE (approximately 15 times the MRHD for buprenorphine [AUC]) with similar effects observed with an equivalent level of the ATRIGEL® delivery system, indicating they may be attributable to the vehicle. Moreover, increased post-implantation loss, which correlated with increased mean number of resorptions and decreased mean number of viable fetuses, and decreased fetal body weights were observed at the same dose.

In a separate embryofetal study, an increased incidence of brachydactyly of the forelimbs, and reduced gallbladder size was seen in fetal rabbits following daily subcutaneous administration of NMP to their dams during the period of organogenesis at doses of 356 mg/kg/day (corresponding to daily administration of SUBLOCADE at 10 times the MRHD, based on body surface area). The NOAEL for these effects (133 mg/kg/day), which was also the NOAEL for maternal toxicity, corresponded to daily administration of SUBLOCADE at 4 times the MRHD, based on body surface area. NMP was administered daily in this study (compared with the proposed clinical monthly dosing) to ensure reproductive tissue exposure throughout the critical periods of development.

Mean pup bodyweights were generally significantly lower than saline and ATRIGEL® groups in both sexes in a rat pre-/postnatal development study with maternal SC administration at 150 mg/kg (administered once on GD 7 and LD7) from birth through weaning and to PND 28; however body weights returned to saline control levels during the F1 growth phase. Dosing with ATRIGEL® or SUBLOCADE had little or no effect on the physical development, sensory response, reflex performance, and subsequent reproductive performance of F1 pups. These results suggested that lowest dose of 50 mg/kg (exposure ratio 1.5 based on body surface area) is the NOAEL for rat pre-/postnatal development.

In a separate pre/postnatal development study, daily subcutaneous administration of NMP to female rats from GD 6 through to the end of lactation (PND 20) at 288 mg/kg/day (equivalent to daily SUBLOCADE doses 3-fold higher than the MRHD, based on body surface area) was associated with decreased offspring body weights at birth and throughout lactation and post-weaning, and reduced fertility and fecundity in both male and female offspring, in the absence of maternal toxicity. Maternal doses of 144 mg/kg (equivalent to daily SUBLOCADE doses 1.6-fold higher than the MRHD, based on body surface area) throughout the same period had no adverse effects on pregnancy or on the physical development, sensory response, reflex performance, and subsequent reproductive performance of F1 pups. NMP was administered daily in this study (compared with the proposed clinical monthly dosing) to ensure reproductive tissue exposure throughout the critical periods of development.

Continued use of heroin during pregnancy is associated with significant risk to the mother and the fetus and neonate.

Buprenorphine readily crosses the placental barrier and may cause respiratory depression in neonates. During the last three months of pregnancy, chronic use of buprenorphine may be responsible for a withdrawal syndrome in neonates (e.g. hypertonia, neonatal tremor, neonatal agitation, myoclonus, or convulsions). The syndrome is generally delayed for several hours to several days after birth. Due to the long half-life of buprenorphine, neonatal monitoring for several days should be considered at the end of pregnancy to prevent the risk of respiratory depression or withdrawal syndrome in neonates.

Data on the use of buprenorphine in pregnancy, and its impact on the mother and fetus, are limited. Data from randomised, controlled trials and observational studies do not indicate an increased risk of maternal or fetal adverse outcomes compared to methadone.

Buprenorphine should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

#### **Use in lactation**

Animal studies indicate buprenorphine has the potential to inhibit lactation or milk production. Decreases in postnatal survival, growth and development were also observed in animals treated with buprenorphine during lactation. In two studies of thirteen women, buprenorphine was found in low levels in human breast milk. In both studies the estimated infant dose was <1% of the maternal dose.



Because buprenorphine passes into the mother’s milk, the development and health benefits of breastfeeding should be considered along with the mother’s clinical need for SUBLOCADE and any potential adverse effects on the breastfed child from the drug or from the underlying maternal condition.

#### 4.7 EFFECTS ON ABILITY TO DRIVE AND USE MACHINES

Buprenorphine may influence the ability to drive and use machines when administered to opioid dependent patients. This product may cause drowsiness, dizziness or impaired thinking, especially during the first few days following treatment and dose adjustment. If used with alcohol or central nervous system depressants the effect is likely to be more pronounced (See section 4.4 Special Warnings and Precautions for Use). Caution patients about operating hazardous machinery, including automobiles, until they are reasonably certain that SUBLOCADE does not adversely affect their ability to engage in such activities.

There is an increased level of buprenorphine for 3 days after each injection. Buprenorphine levels increase during the first two months and are maintained with the 100mg dose; further accumulation occurs with the 300mg maintenance dose, which achieves steady-state after the fourth monthly injection.

#### 4.8 ADVERSE EFFECTS (UNDESIRABLE EFFECTS)

The clinical safety of SUBLOCADE was evaluated in a total of 1083 opioid-dependent subjects who received at least 1 dose of SUBLOCADE (948 of whom received at least 1 dose of 300 mg) during the clinical development program, with 848 subjects in the pivotal Phase 3 studies and 235 in the Phase 1 and 2 studies. In these studies, there were a total of 570 subjects who received at least 6 injections of SUBLOCADE and 395 subjects who received 12 injections.

The most commonly reported treatment related adverse reactions reported during the pivotal clinical studies (≥5% of subjects) were constipation, nausea, vomiting, headache, fatigue, hepatic enzymes increased, and injection site pain and pruritus.

Adverse events reported for the groups receiving SUBLOCADE and placebo following administration in the 6-month, double-blind, placebo-controlled study are shown in Table 3. Both dosing regimens of SUBLOCADE included treatment with 300 mg for 2 months then either 100 mg or 300 mg for 4 months. The frequency of possible side effects listed below is defined using the following convention: Very common (≥1/10), Common (≥1/100 to <1/10).

**Table 3 Adverse Events during the Phase 3 Double-Blind Study: ≥1% of Total Subjects Receiving SUBLOCADE by Body System and Treatment Group in Study RB-US-13-0001**

System Organ Class Preferred term	SUBLOCADE (300/300 mg) N=201	SUBLOCADE (300/100 mg) N=203	Placebo N=100
<b>Gastrointestinal Disorders</b>			
Constipation	16 (8.0%)	19 (9.4%)	0
Nausea	16 (8.0%)	18 (8.9%)	5 (5.0%)
Vomiting	11 (5.5%)	19 (9.4%)	4 (4.0%)
Toothache	5 (2.5%)	8 (3.9%)	1 (1.0%)
Diarrhoea	5 (2.5%)	5 (2.5%)	5 (5.0%)
Abdominal pain upper	3 (1.5%)	4 (2.0%)	1 (1.0%)

System Organ Class Preferred term	SUBLOCADE (300/300 mg) N=201	SUBLOCADE (300/100 mg) N=203	Placebo N=100
<b>General Disorders and Administration Site Conditions</b>			
Injection site pruritus	19 (9.5%)	13 (6.4%)	4 (4.0%)
Injection site pain	12 (6.0%)	10 (4.9%)	3 (3.0%)
Fatigue	12 (6.0%)	8 (3.9%)	3 (3.0%)
Drug withdrawal syndrome	7 (3.5%)	9 (4.4%)	6 (6.0%)
Injection site erythema	6 (3.0%)	9 (4.4%)	0
Pain	5 (2.5%)	3 (1.5%)	4 (4.0%)
Injection site bruising	2 (1.0%)	2 (1.0%)	0
Injection site induration	2 (1.0%)	2 (1.0%)	0
Injection site oedema/swelling	2 (1.0%)	2 (1.0%)	0
Non-cardiac chest pain	2 (1.0%)	2 (1.0%)	0
<b>Infections and Infestations</b>			
Upper respiratory tract infection	12 (6.0%)	15 (7.4%)	1 (1.0%)
Nasopharyngitis	10 (5.0%)	11 (5.4%)	1 (1.0%)
Tooth abscess	5 (2.5%)	8 (3.9%)	0
Urinary tract infection	5 (2.5%)	4 (2.0%)	0
Gastroenteritis viral	5 (2.5%)	3 (1.5%)	0
Sinusitis	3 (1.5%)	3 (1.5%)	1 (1.0%)
Bronchitis	1 (0.5%)	5 (2.5%)	0
Tooth infection	1 (0.5%)	5 (2.5%)	0
Cellulitis	2 (1.0%)	2 (1.0%)	1 (1.0%)
<b>Nervous System Disorders</b>			
Headache	17 (8.5%)	19 (9.4%)	6 (6.0%)
Somnolence	4 (2.0%)	10 (4.9%)	0
Sedation	3 (1.5%)	7 (3.4%)	0
Dizziness	3 (1.5%)	5 (2.5%)	2 (2.0%)
Migraine	3 (1.5%)	2 (1.0%)	0
Lethargy	3 (1.5%)	1 (0.5%)	0
Paraesthesia	3 (1.5%)	1 (0.5%)	0
<b>Investigations</b>			
Hepatic enzyme increased*	15 (7.5%)	14 (6.9%)	1 (1.0%)
Blood creatine phosphokinase increased	5 (2.5%)	11 (5.4%)	1 (1.0%)
Weight increased	7 (3.5%)	2 (1.0%)	0
Electrocardiogram QT prolonged	3 (1.5%)	2 (1.0%)	0
Lipase increased	1 (0.5%)	3 (1.5%)	1 (1.0%)
<b>Psychiatric Disorders</b>			
Insomnia	17 (8.5%)	13 (6.4%)	11 (11.0%)
Anxiety	8 (4.0%)	10 (4.9%)	5 (5.0%)
<b>Musculoskeletal and Connective Tissues Disorders</b>			
Back pain	6 (3.0%)	8 (3.9%)	3 (3.0%)
Arthralgia	3 (1.5%)	4 (2.0%)	3 (3.0%)
Pain in extremity	4 (2.0%)	1 (0.5%)	0
Muscle twitching	3 (1.5%)	1 (0.5%)	0

System Organ Class Preferred term	SUBLOCADE (300/300 mg) N=201	SUBLOCADE (300/100 mg) N=203	Placebo N=100
<b>Skin and Subcutaneous Tissue Disorders</b>			
Hyperhidrosis	4 (2.0%)	4 (2.0%)	0
Pruritus	3 (1.5%)	4 (2.0%)	0
Rash	1 (0.5%)	6 (3.0%)	0
<b>Injury, Poisoning and Procedural Complications</b>			
Ligament sprain	3 (1.5%)	2 (1.0%)	0
Limb injury	1 (0.5%)	3 (1.5%)	1 (1.0%)
Muscle strain	2 (1.0%)	2 (1.0%)	0
Road traffic accident	1 (0.5%)	3 (1.5%)	0
<b>Respiratory, Thoracic and Mediastinal Disorders</b>			
Cough	3 (1.5%)	2 (1.0%)	0
Dyspnoea	3 (1.5%)	1 (0.5%)	0
<b>Vascular Disorders</b>			
Hypertension	2 (1.0%)	3 (1.5%)	0
Hot flush	2 (1.0%)	2 (1.0%)	1 (1.0%)
<b>Metabolism and Nutrition Disorders</b>			
Decreased appetite	4 (2.0%)	1 (0.5%)	3 (3.0%)

\* Includes Hepatic enzyme increased, Liver function test abnormal, and elevations of ALT, AST, GGT, Alkaline phosphatase and/or bilirubin. There were no cases of severe drug-induced liver injury (Hy's Law).

#### **Less Common Clinical Trial Adverse Reactions**

Treatment-emergent adverse reactions reported as less common (<1%) during the pivotal Phase 3 studies of the SUBLOCADE clinical development program included:

*Eye disorders:* Vision blurred

*General disorders and administration site conditions:* Injection site discomfort, injection site reaction

*Hepatobiliary disorders:* Hepatic function abnormal

*Infections and infestations:* Injection site cellulitis, injection site infection

*Nervous system disorders:* Dizziness postural, syncope

*Psychiatric disorders:* Euphoric mood, libido decreased

*Reproductive system and breast disorders:* Erectile dysfunction

*Vascular disorders:* Hypotension

#### **Post-marketing experience with buprenorphine**

Post-marketing experience with buprenorphine containing products for treatment of opioid dependence has been associated with the following side effects: respiratory depression (see PRECAUTIONS) and coma, hallucinations, neonatal withdrawal syndrome, neonatal tremor, neonatal feeding disorder, fetal disorders, convulsions, confusion, miosis, weight decrease, asphyxia, hypoventilation, urinary retention, vertigo, drug dependence, headache, nausea, vomiting, drug withdrawal syndrome, peripheral oedema, orthostatic hypotension, heart rate and rhythm disorders, and deaths.

Cases of hepatitis, jaundice, hepatic failure, hepatic necrosis, hepatorenal syndrome, hepatic encephalopathy, hepatic necrosis and elevations in hepatic transaminases have been reported (see PRECAUTIONS).

Cases of acute or chronic hypersensitivity to buprenorphine have been reported with symptoms including rashes, urticaria, pruritus and reported cases of bronchospasm, angioedema, and anaphylactic shock (see Sections 4.3 Contraindications and 4.4 Special Warnings and Precautions for Use).

Cases of serotonin syndrome, a potentially life-threatening condition, have been reported during concomitant use of opioids with serotonergic drugs. As with other opioids, buprenorphine could cause serotonin syndrome with concomitant administration of serotonergic drugs (e.g., antidepressants, migraine medications). Treatment with the serotonergic drug should be discontinued if such events (characterized by clusters of symptoms such as hyperthermia, rigidity, myoclonus, autonomic instability with possible rapid fluctuations of vital signs, mental status changes including confusion, irritability, extreme agitation progressing to delirium and coma) occur and supportive symptomatic treatment should be initiated.

#### ***Reporting suspected adverse effects***

Reporting suspected adverse reactions after registration of the medicinal product is important. It allows continued monitoring of the benefit-risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions at [www.tga.gov.au/reporting-problems](http://www.tga.gov.au/reporting-problems).

## **4.9 OVERDOSE**

Manifestations of acute overdose include miosis, sedation, hypotension, respiratory depression and death. Nausea and vomiting may be observed.

The major symptom requiring intervention is respiratory depression, which could lead to respiratory arrest and death. If the patient vomits, care must be taken to prevent aspiration of the vomitus.

#### ***Treatment***

In the event of depression of respiratory or cardiac function, primary attention should be given to the re-establishment of adequate respiratory exchange through provision of a patent airway and institution of assisted or controlled ventilation following standard intensive care measures. The patient should be transferred to an environment within which full resuscitation facilities are available. Oxygen, intravenous fluids, vasopressors, and other supportive measures should be employed as indicated. High doses of naloxone hydrochloride 10-35 mg/70 kg may be of limited value in the management of buprenorphine overdose.

The long duration of action of buprenorphine should be taken into consideration when determining the length of treatment needed to reverse the effects of an overdose. Naloxone can be cleared more rapidly than buprenorphine, allowing for a return of previously controlled buprenorphine overdose symptoms, so a continuing infusion may be necessary. Ongoing IV infusion rates should be titrated to patient response. If infusion is not possible, repeated dosing with naloxone may be required.

Clinical data are limited with regards to the possible surgical removal of the depot as only two cases of surgical removal were reported in premarketing clinical studies.

For further information on the management of overdose, contact the Poison Information Centre on 131126 (Australia) or National Poisons Centre on 0800 764 766 (New Zealand).

## 5 PHARMACOLOGICAL PROPERTIES

### 5.1 PHARMACODYNAMIC PROPERTIES

#### **Mechanism of action**

Buprenorphine is a  $\mu$  (mu) opioid receptor partial agonist,  $\kappa$  (kappa) opioid receptor antagonist. Its activity in opioid maintenance treatment is attributed to its slow dissociation from the  $\mu$  receptors in the brain which reduces craving for opioids and opioid withdrawal symptoms. This minimises the need of the opioid dependent patient for illicit opioid medicines.

During clinical pharmacology studies in opioid-dependent subjects, buprenorphine demonstrated a ceiling effect on a number of parameters, including positive mood, "good effect", and respiratory depression.

An intent of buprenorphine treatment is to suppress withdrawal symptoms, cravings and opioid drug liking. These effects are achieved through sufficient receptor occupancy (receptor blockade) as described below.

#### ***Plasma concentration and Clinical Response***

In Opioid blockade study (13-0002) overall the relationship of the buprenorphine plasma concentration versus the VAS scores for the subjective measures (Drug Liking, Any Drug Effect, Good Drug Effect, Bad Drug Effect, Sedation, and High,) indicate there was a reduction in VAS scores with increased buprenorphine plasma concentration.

In a Positron Emission Tomography (PET) study with SUBLOCADE in 2 subjects (one subject receiving 200 mg SC injections and one subject receiving 300 mg SC injections) with opioid use disorder, 79 to 92% occupancy of the mu-opioid receptors in the brain at day 7 following the last dose under steady-state conditions was maintained for 28 days to 75 & 81%.

The SUBLOCADE opioid blockade study evaluated the blockade of subjective opioid effects, pharmacokinetics (PK) and safety of SC injections of SUBLOCADE and the results are presented in the Clinical Trials section.

Exposure-response relationships were assessed for illicit opioid use, based on urine samples negative for illicit opioids combined with self-reports negative for illicit opioid use, craving and withdrawal symptoms using data obtained from 489 opioid dependent patients in the double-blind Phase 3 Study (13-0001).

The observed plateau for maximal response was reached at buprenorphine plasma concentrations of approximately 2-3 ng/mL for illicit opioid use and 4 ng/mL for opioid withdrawal symptoms.

Withdrawal symptoms [Clinical Opiate Withdrawal Scale (COWS)] were clinically controlled (defined as  $\leq 12$  on a 48-point scale) in most subjects consistent with a concentration of  $\geq 2$  ng/mL, however, observed maximal response (COWS 0) was reached at approximately 4 ng/mL.

Opioid craving was clinically controlled (defined as craving  $\leq 20$  on a 100-point Opioid Craving VAS) in most subjects consistent with a concentration of  $\geq 2$  ng/mL, however, the observed plateau for maximal response (0 craving) was reached at approximately 3 ng/mL.

#### **Clinical trials**

The pivotal studies from the SUBLOCADE clinical development program are a Phase 3 double-blind efficacy and safety study (13-0001) and an opioid blockade study (13-0002).

### *Opioid blockade study (13-0002)*

The study evaluated the blockade of subjective opioid effects, PK and safety of SC injections of SUBLOCADE in 39 subjects with OUD (not treatment-seeking).

The primary objective of this study was to demonstrate that the "Drug Liking" visual analog scale (VAS) measured after challenge with intramuscular injections of 6mg (Dose 1) and 18mg (Dose 2) hydromorphone is noninferior to the "Drug Liking" visual analog scale (VAS) measured after challenge with placebo at weeks 1 through 4 following the first injection of 300mg SUBLOCADE.

After SUBLOCADE injections at weeks 0 and 4, on average, subjective effects of both 6 and 18 mg doses of hydromorphone were blocked; however wide variability was seen across subjects. Complete blockade continued throughout the 8 weeks of observation that followed the second SUBLOCADE injection.

For comparison, stabilisation doses of SL buprenorphine in Week 0 failed to provide full blockade of subjective effects of 18 mg of hydromorphone.

### *Efficacy study (13-0001)*

The efficacy of SUBLOCADE in the treatment of opioid use disorder was evaluated in a Phase 3, 24-week, randomised, double-blind, placebo-controlled, multicentre trial in treatment-seeking patients who met the DSM-5 criteria for moderate or severe opioid use disorder. Patients were randomised to one of following dosing regimens: 6 once-monthly 300 mg doses, 2 once-monthly 300 mg doses followed by 4 once-monthly 100 mg doses, or 6 once-monthly SC injections of placebo. All doses were administered by a physician or suitably-qualified designee and were separated by  $28 \pm 2$  days. In addition to study medication, all subjects received protocol specified psychosocial support at least once a week (Individual Drug Counselling = IDC).

Prior to the first dose, subjects were inducted and dose stabilised on 8/2 to 24/6 mg per day of SUBOXONE<sup>®</sup> (buprenorphine/naloxone) sublingual film (SUBOXONE SL Film) for a minimum of 7 days. Subjects were considered dose stabilised when cravings and withdrawal symptoms were clinically controlled ( $\leq 12$  on a 48-point COWS scale and  $\leq 20$  on a 100-point Opioid Craving VAS) for a minimum of 24 hours. After randomisation, supplemental dosing with SUBOXONE SL Film was not permitted during the study.

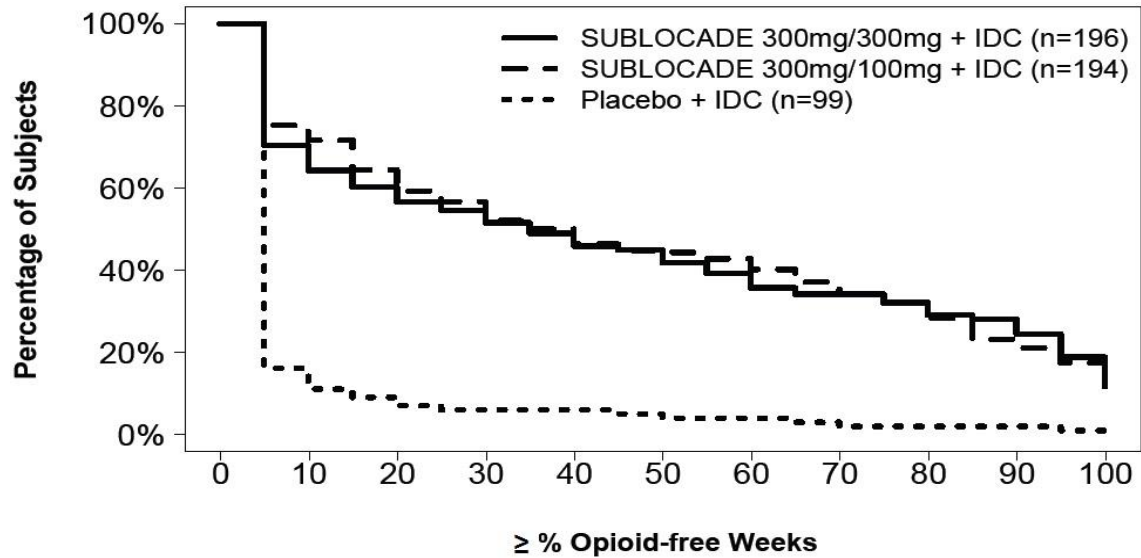
Efficacy was evaluated over Weeks 5 to 24 based on weekly urine drug screens combined with self-reported use of illicit opioid use. A "grace period" was applied for Weeks 1 through 4 to allow patients to stabilise in treatment. During this period, opioid use, if it occurred, was not considered in the analysis. Missing urine drug screen samples and/or self-reports during weeks 5-24 were counted as positive for illicit opioids. The key secondary endpoint was treatment success (responder), defined as any subject with  $\geq 80\%$  of urine samples negative for opioids combined with self-reports negative for illicit opioid use (opioid-free weeks) from Week 5 through Week 24.

A total of 504 patients were randomised 4:4:1:1 [203 subjects in the 300 mg/100 mg group, 201 patients in the 300 mg/300 mg group and 100 patients in the placebo group (2 groups of volume-matched placebo)].

Based on the cumulative distribution function (CDF) of the percentage of urine samples negative for illicit opioids combined with self-reports of negative for illicit opioid is collected from week 5 through week 24 (Table 4), regardless of dose, SUBLOCADE was superior to the placebo group with statistical significance. The proportion of patients achieving treatment success (defined as patients with  $\geq 80\%$  opioid-free weeks) was statistically significantly higher in both groups receiving SUBLOCADE compared to the placebo group.

Analysis of the dropout pattern in Study 13-0001 indicated that opioid craving was a major predictor of dropout. An opioid craving score >20 was associated with an increase in dropout rate of up to 3.0 and 3.6-fold in active treatment arms and placebo arm, respectively, compared to craving ≤5.

**Figure 10. Subjects Achieving Varying Percentages of Opioid-Free Weeks**



**Table 4. Cumulative Distribution Function of Percentage of Opioid-Free Weeks**

Percentage Opioid-Free Weeks	Number (%) of Subjects		
	SUBLOCADE 300mg/100mg + IDC (N = 194)	SUBLOCADE 300mg/300mg + IDC (N = 196)	Placebo + IDC (N = 99)
≥ 0%	194 (100.0)	196 (100.0)	99 (100.0)
≥ 10%	139 (71.6)	126 (64.3)	11 (11.1)
≥ 20%	115 (59.3)	111 (56.6)	7 (7.1)
≥ 30%	101 (52.1)	101 (51.5)	6 (6.1)
≥ 40%	90 (46.4)	90 (45.9)	6 (6.1)
≥ 50%	86 (44.3)	82 (41.8)	4 (4.0)
≥ 60%	78 (40.2)	70 (35.7)	4 (4.0)
≥ 70%	66 (34.0)	67 (34.2)	2 (2.0)
≥ 80%	55 (28.4)	57 (29.1)	2 (2.0)
≥ 90%	41 (21.1)	48 (24.5)	2 (2.0)
= 100%	25 (13)	23 (12)	1 (1.0)

**Table 5 Primary and Key Secondary Endpoints (Study 13-0001)**

	SUBLOCADE 300 mg/100 mg	SUBLOCADE 300 mg/300 mg	Placebo
<b>Percentage Abstinence (Opioid-free Weeks)</b>			
Mean (SD)	42.7% (38.50%)	41.3% (39.66%)	5.0% (16.98%)
p-value	< 0.0001	< 0.0001	-
<b>≥80% Abstinence (Opioid-free Weeks) (Responder)</b>			
Treatment Success*	28.4%	29.1%	2.0%
p-value	< 0.0001	< 0.0001	-

\*Treatment success was defined as any subject with ≥80% of urine samples negative for opioids combined with self-reports negative for illicit opioid use between Week 5 and Week 24.

## 5.2 PHARMACOKINETIC PROPERTIES

### Absorption

The pharmacokinetics (PK) of buprenorphine following subcutaneous injection of SUBLOCADE was evaluated in subjects with opioid use disorder after single doses (20 mg to 200 mg) and repeated doses (50 to 300 mg) separated by 28 days for up to 12 injections.

After SUBLOCADE injection, an initial buprenorphine peak was observed and the median T<sub>max</sub> occurred at 24 hours after injection. After the initial buprenorphine peak, the plasma buprenorphine concentrations decreased slowly to a plateau. Steady-state was achieved at 4-6 months. Observed mean buprenorphine concentrations levels for C<sub>avg</sub>, C<sub>max</sub> and C<sub>min</sub> are presented in Table 6.

**Table 6 Comparison of Buprenorphine Mean Pharmacokinetic parameters between SUBUTEX and SUBLOCADE**

Pharmacokinetic parameters	SUBUTEX daily stabilisation		SUBLOCADE		
	12 mg (steady-state)	24 mg (steady-state)	300 mg <sup>1</sup> (1 <sup>st</sup> injection)	100 mg <sup>2</sup> (steady-state)	300 mg <sup>2</sup> (steady-state)
Mean					
C <sub>avg,ss</sub> <sup>3</sup> (ng/mL)	1.71	2.91	2.19	3.21	6.54
C <sub>max,ss</sub> (ng/mL)	5.35	8.27	5.37	4.88	10.12
C <sub>min,ss</sub> (ng/mL)	0.81	1.54	1.86 <sup>4</sup>	2.48	5.01

<sup>1</sup>Exposure after 1 injection of 300 mg SUBLOCADE following 24 mg SUBUTEX stabilisation

<sup>2</sup>Steady-state exposure after 4 injections of 100 mg or 300 mg SUBLOCADE, following 2 injections of 300 mg SUBLOCADE

<sup>3</sup>C<sub>avg,ss</sub> represents the average of plasma concentrations calculated as AUC<sub>tau</sub>/tau where tau is 24 hours for SUBUTEX daily administration and tau is 28 days for SUBLOCADE injections

<sup>4</sup> C<sub>min</sub> on Day 29 (end of dosing interval)

### Distribution

Buprenorphine is approximately 96% protein bound, primarily to alpha and beta globulin.



## **Metabolism**

Buprenorphine is metabolised into its major metabolite, norbuprenorphine, primarily by CYP3A4. Norbuprenorphine can further undergo glucuronidation. Norbuprenorphine has been found to bind opioid receptors *in vitro*; however, it has not been studied clinically for opioid-like activity. Norbuprenorphine steady-state plasma concentrations in humans after subcutaneous injection of SUBLOCADE are low compared to buprenorphine (AUC norbuprenorphine/buprenorphine ratio of 0.20 to 0.40).

## **Excretion**

Buprenorphine is metabolised and eliminated in urine and faeces. The apparent terminal plasma half-life of buprenorphine following subcutaneous injection of SUBLOCADE ranged from 43 to 60 days as a result of the slow release of buprenorphine from the subcutaneous depot.

Buprenorphine is essentially eliminated in the faeces by biliary excretion of the glucuroconjugated metabolites (70%), the rest being eliminated in urine.

## **5.3 PRECLINICAL SAFETY DATA**

### **Genotoxicity**

No evidence of clastogenic potential towards rat bone marrow cells by subcutaneous SUBLOCADE was found in an *in vivo* micronucleus test.

The conclusion from various genotoxicity assays, including Ames tests and chromosome aberration studies is that buprenorphine and N-methyl-2-pyrrolidone (NMP) are not genotoxic.

### **Carcinogenicity**

Studies conducted in animals (rats and mice) show that buprenorphine is not carcinogenic at oral doses of up to 56 and 100 mg/kg/day, respectively, both of which equate to approximately 15-fold human exposure at the maximum recommended clinical dose of 32 mg based on body surface area. N-methyl-2-pyrrolidone (NMP), an excipient in SUBLOCADE, produced an increase in hepatocellular adenomas and carcinomas in male and female mice at around 6 and 8 times, respectively, the maximum daily dose (MDD) of NMP delivered via SUBLOCADE. The clinical significance of these findings is unclear. No tumours were noted at 1 and 1.3 times the MDD. Exposure of rats to NMP for 2 years via inhalation (at around 0.7 x MDD) or via diet (at around 3 x MDD) was shown to be non-carcinogenic. The possible carcinogenicity of NMP from subcutaneous SUBLOCADE has not been tested.

## **6 PHARMACEUTICAL PARTICULARS**

### **6.1 LIST OF EXCIPIENTS**

ATRIGEL® Delivery System contains:

polyglactin

N-methyl-2-pyrrolidone

## **6.2 INCOMPATIBILITIES**

In the absence of compatibility studies, this medicinal product must not be mixed with other medicinal products.

## **6.3 SHELF LIFE**

18 months.

## **6.4 SPECIAL PRECAUTIONS FOR STORAGE**

Store at 2 - 8°C. Refrigerate. Do not freeze.

Once outside the refrigerator this product may be stored in its original packaging at room temperature (below 25°C) for up to 28 days prior to administration.

Discard SUBLOCADE if left at room temperature for longer than 28 consecutive days.

## **6.5 NATURE AND CONTENTS OF CONTAINER**

SUBLOCADE is supplied in a single use pack.

SUBLOCADE buprenorphine 100 mg/0.5 mL modified release injection solution for subcutaneous administration is supplied as a single use dose in a 1 mL plastic syringe with a plunger stopper (bromobutyl rubber), together with a pre-packaged sterile safety needle (19 G, 16 mm with polypropylene shield).

SUBLOCADE buprenorphine 300 mg/1.5 mL modified release solution for injection for subcutaneous administration is supplied as a single-use dose in a 2.25 mL plastic syringe with a plunger stopper (bromobutyl rubber), together with a pre-packaged sterile safety needle (19 G, 16 mm with polypropylene shield).

Each assembled syringe with plastic plunger rod is supplied in an aluminium foil-laminate pouch containing an oxygen absorber. The pouch is in a labelled paperboard carton along with a sterile safety needle and labelling.

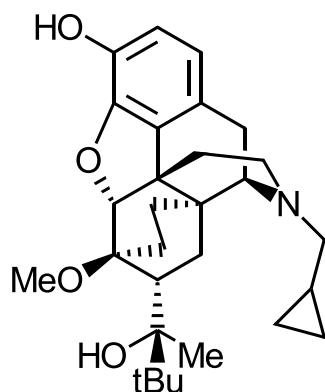
## **6.6 SPECIAL PRECAUTIONS FOR DISPOSAL**

Dispose of all syringe components in a secure sharps disposal container.

## **6.7 PHYSICOCHEMICAL PROPERTIES**

### **Chemical structure**

The chemical structure of buprenorphine is:



**CAS number**

The CAS number is 52485-79-7.

**7 MEDICINE SCHEDULE (POISONS STANDARD)**

Schedule 8

**8 SPONSOR**

Indivior Pty Ltd  
 78 Waterloo Road  
 Macquarie Park NSW 2113  
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For adverse event reporting please contact:

Indivior Pty Ltd  
 +800-270-81901  
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**9 DATE OF FIRST APPROVAL**

18 July 2019

**10 DATE OF REVISION**

29 March 2021

**SUMMARY TABLE OF CHANGES**

Section Changed	Summary of new information
6.3 6.4	Reduction of shelf-life to 18 months Extension of period at room temperature.
4.4	TGA Review of prescription opioids – addition of black box warning

	Addition of information on hazardous and harmful use, life-threatening respiratory depression and concomitant use of benzodiazepines and other CNS depressants.
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