*** BACLOFFA INJECTION**

0.05 mg/mL, 0.5 mg/mL, and 2 mg/mL
For intrathecal injection and intrathecal infusion only

## THERAPEUTIC CLASSIFICATION

Antispastic Agent

## CLINICAL PHARMACOLOGY

The precise mechanisms of action of baclofen as an antispastic agent are not fully understood. Baclofen inhibits both monosynaptic and polysynaptic activity in animal models. It may act in humans by decreasing excitatory neurotransmitter release from primary afferent terminals. Actions at supraspinal sites may also contribute to its clinical effect. Baclofen is an analogue of the inhibitory neurotransmitter gamma-aminobutyric acid (GABA), and may exert its effect in part by binding to GABA receptors.

Baclofen has been shown to have general Central Nervous System (CNS) depressant properties as indicated by the production of sedation, drowsiness, and ataxia. Baclofen has been reported to cause severe depression. It does dependent irritability effect on erectile function has been shown in men through GABA<sub>B</sub> receptor stimulation.

In neurological diseases associated with spasm of the skeletal muscles, baclofen intrathecal may have beneficial action on reflex activity originating in the spinal cord, including spasms, clonus, tonus, and clonus. Neuromuscular transmission is not affected by baclofen. Baclofen may also reduce pain associated with spasticity.

## Pharmacokinetics of Baclofen Intrathecal

### Intrathecal Bolus

The onset of action is generally half an hour to one hour after administration of an intrathecal bolus dose. Peak antispastic effect may be seen in approximately 4 hours and effects may last for 4 to 8 hours. Small, peak response, and duration of action vary with individual patients depending on the dose and severity of symptoms.

### Continuous Intrathecal Infusion

The antispastic action is best seen at 6 to 8 hours after initiation of continuous infusion.

Minimum efficacy is observed in 24 to 48 hours.

## Pharmacokinetics of Baclofen Intrathecal

After baclofen intrathecal administration, the concentration of baclofen in cerebrospinal fluid (CSF) is approximately 100 times higher than what is found following oral administration.

Because of slow CSF circulation and a baclofen concentration-dependent elimination from CSF, the pharmacokinetic parameters as described below should be interpreted considering a high inter- and intra-patient variability.

The clearance of intrathecal baclofen, calculated from intrathecal bolus or continuous infusion studies, approximate to CSF turnover. Elimination half-life ranges from 2 to 14 hours. The half-life includes the spinal subarachnoid space bypasses absorption processes and allows exposure to the receptor sites in the dorsal horn of the spinal cord.

### Intravenous Bolus

Following intrathecal administration of 50 or 100 mg baclofen intrathecal in 7 patients, the average CSF elimination half-life was 1.51 hours over the first four hours and the average CSF clearance was approximately 0.7 mL/min. In the 100 mg dose group, 3 patients received semi-chronic infusions, the volume of distribution in intrathecal compartment, calculated from CSF levels, ranges from 22 to 157 mL.

### Continuous Infusion

A study conducted in 15 patients, suggests that the mean CSF clearance for continuous intrathecal infusion of baclofen is approximately 30 mL/hour.

Continuous intrathecal infusion daily doses of 50 to 1200 mcg result in lumbar CSF concentrations of baclofen as high as 1000 ng/mL. The CSF concentration of baclofen is also measured in the CSF. CSF steady state concentrations will be reached within 1-2 days. During intrathecal infusion the plasma concentration of baclofen is very low.

Limited pharmacokinetic data suggest that a lumbar-external baclofen concentration gradient of about 4:1 is established during continuous baclofen infusion. This is likely due to the presence of CSF sampling via external and lumbar flow during continuous baclofen infusion. This gradient may be important in the clinical efficacy. The intracranial variability was considerable. This gradient suggests that spasticity in the lower extremities may be relieved with lower CSF levels than in the upper extremities. Lumbar external medicines due to diminished effects on the brain.

## General Pharmacokinetics

### Excretion

No pharmacokinetic data is available in elderly patients after administration of baclofen intrathecal. Where a single dose and the total baclofen intrathecal dose, the elimination half-life is prolonged. This is slower rate of elimination and elimination, a slightly prolonged elimination half-life, but a similar systemic exposure to baclofen compared to young adults.

### Hepatic Impairment

No pharmacokinetic data is available in patients with hepatic impairment after administration of baclofen intrathecal.

The dose does not play a significant role in the disposition of baclofen, it is unlikely that its pharmacokinetics would be altered to a clinically significant extent in patients with hepatic impairment.

### Renal Impairment

No pharmacokinetic data is available in patients with renal impairment after administration of baclofen intrathecal. Since baclofen is primarily eliminated unchanged through the kidneys, renal impairment is expected to lead to a decrease in baclofen clearance. Renal impairment, neurological outcomes have been reported in patients with renal impairment after oral administration. Use in patients with renal impairment requires careful monitoring.

## INDICATIONS AND CLINICAL USE

Baclofen injection is indicated for the management of patients with severe spasticity due to spinal cord injury or multiple sclerosis who are unresponsive to oral baclofen or who experience unacceptable side effects or intolerable dose.

Intrathecal baclofen should not be considered as an alternative to destructive neurosurgical procedures.

Prior to implantation of a device for chronic intrathecal infusion, patients must demonstrate a positive clinical response to a Baclofen injection screening trial (see **DOSAGE AND ADMINISTRATION**).

Intrathecal baclofen injection is indicated for the management of severe spasticity, a condition following injury to spinal cord, multiple head injury, or stroke, however, clinical experience is limited.

## CONTRAINDICATIONS

Known or suspected hypersensitivity to baclofen or to any of the excipients.

**Baclofen injection should not be administered by intravenous, intramuscular, subcutaneous, or epidural routes.**

## WARNINGS

Because of the possibility of potential life-threatening CNS depression, cardiovascular collapse and/or respiratory failure, Baclofen injection should be administered only by experienced physicians.

Specific instructions for programming and/or refilling the implantable pump are given by the pump manufacturers and must be strictly adhered to. Consult pump manufacturer's literature for information on the appropriate use and care of these devices.

Baclofen injection should be administered only by trained personnel and the administration of dosage following pump implantation, these procedures must be performed in a medically supervised and adequately equipped environment (see **DOSAGE AND ADMINISTRATION**).

### Neuromotor equipment should be available.

Baclofen injection should be administered with caution and under the supervision and addition, have been reported in some patients with severe spasticity, and in patients, these reports include cases of death, may interfere with an assessment of the patient's response to bolus intrathecal baclofen.

Careful monitoring of respiratory and cardiovascular functions is essential during initial bolus administration (screening phase), particularly in patients with severe spasticity of spinal cord origin.

Following surgical implantation of the pump, particularly during the initial phase of pump use, the patient should be monitored closely for signs of CNS depression, respiratory failure, or cardiac collapse.

Whenever the dosing rate of the pump, particularly during the initial phase of pump use, the patient should be monitored closely for signs of CNS depression, respiratory failure, or cardiac collapse.

It is mandatory that the patient and all those involved in the care of the patient receive adequate information regarding the risks of the implantation procedure, the implanted pump, and the use of baclofen intrathecal. In the event of overdose and 2) proper care of the pump and insertion site.

### Inflammatory mass at the tip of implanted catheter with baclofen intrathecal

Cases of inflammatory mass at the tip of the implanted catheter have been reported in patients with baclofen intrathecal administration. These reports include cases in which the inflammatory mass is decreased (therapeutic response) symptoms, spasticity, symptoms, pain response to escalating doses, or frequent or large dosage increases. It is known that inflammatory mass at intrathecal catheter tip may cause a life-threatening neurological emergency. Clinical monitor patients for baclofen intrathecal therapy carefully for any new neurological signs or symptoms. In patients with new neurological signs or symptoms, consider the possibility of an inflammatory mass and consider prompt diagnostic evaluation. Signs and symptoms of inflammatory mass are similar to the symptoms experienced with baclofen intrathecal overdose. Prompt diagnostic evaluation and imaging procedures may be appropriate to confirm or rule-out inflammatory mass. Inflammatory masses have also been reported in patients without baclofen intrathecal administration. Inflammatory masses, including spasticity. Diagnosis and management of inflammatory mass in these patients should take into consideration the pharmacology of the drugs in addition to Baclofen injection.

### Seizures

The onset of seizures or worsening of a pre-existing seizures has been reported in patients treated with Baclofen injection. Signs of seizures should be monitored during treatment with Baclofen injection.

## Abrupt Drug Withdrawal

Abrupt withdrawal of baclofen intrathecal, regardless of the cause, may precipitate a drastic that include high fever, altered mental status, exaggerated rebound spasticity, and muscle rigidity. Life-threatening complications have been reported in patients.

Prevention of abrupt discontinuation of Baclofen injection requires careful attention to proper programming and monitoring of the infusion system, refill scheduling and procedures, and the patient's medical condition. Abrupt withdrawal can result from the interruptions of medicine scheduled refill visits and should be calculated on the early symptoms of Baclofen injection withdrawal, which may include pain, muscle spasms, paresthesia, and/or CNS reactions. Symptoms of withdrawal are similar, communication difficulties, history of withdrawal symptoms from oral baclofen or Baclofen injection, and/or CNS reactions. Prompt diagnosis and appropriate treatment are essential. Consult pump manufacturer's literature for information on the appropriate use and care of these devices.

## Hypersensitivity to Baclofen

Hypersensitivity to baclofen has been reported with the patient's response to a bolus intrathecal injection of Baclofen injection has been properly evaluated and found to be clinically safe and effective.

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### Inflammatory mass at the tip of implanted catheter with baclofen intrathecal

Cases of inflammatory mass at the tip of the implanted catheter have been reported in patients with baclofen intrathecal administration. These reports include cases in which the inflammatory mass is decreased (therapeutic response) symptoms, spasticity, symptoms, pain response to escalating doses, or frequent or large dosage increases. It is known that inflammatory mass at intrathecal catheter tip may cause a life-threatening neurological emergency. Clinical monitor patients for baclofen intrathecal therapy carefully for any new neurological signs or symptoms. In patients with new neurological signs or symptoms, consider the possibility of an inflammatory mass and consider prompt diagnostic evaluation. Signs and symptoms of inflammatory mass are similar to the symptoms experienced with baclofen intrathecal overdose. Prompt diagnostic evaluation and imaging procedures may be appropriate to confirm or rule-out inflammatory mass. Inflammatory masses have also been reported in patients without baclofen intrathecal administration. Inflammatory masses, including spasticity. Diagnosis and management of inflammatory mass in these patients should take into consideration the pharmacology of the drugs in addition to Baclofen injection.

### Bradycardia

Bradycardia has been reported in patients treated with Baclofen injection. Signs of scoliosis should be monitored during treatment with Baclofen injection.

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## PRECAUTIONS

### Drug: withdrawal reactions including irritability, high-pitched crying, tremor, hyperkinesia, excessive sucking, disordered sleep, hyperthermia, vomiting, and peripheral convulsions have been reported in infants born to mothers who have been treated with baclofen with risk of intrauterine exposure to baclofen should be carefully monitored for the development of signs consistent with withdrawal. Infants born to mothers who have been treated with non-pharmacologic measures should be considered the sedatives, minimizing sensory or environmental stimulation, maintaining adequate nutrition, and decreasing the frequency of feeds. Initiation of pharmacotherapy may be considered in neonates with moderate to severe signs of withdrawal. Consult pump manufacturer's literature for information on the appropriate use and care of these devices.

## Screening

Patients should be infection free prior to the screening trial with Baclofen injection. Patients should be free of any active infection, may interfere with an assessment of the patient's response to bolus intrathecal baclofen.

Careful monitoring of respiratory and cardiovascular functions is essential during initial bolus administration (screening phase), particularly in patients with severe spasticity of spinal cord origin.

Elderly patients may be more susceptible to the side effects of oral baclofen in the direction dosage and thus may also apply to intrathecal baclofen.

## Pediatrics

The safety and efficacy of baclofen intrathecal has not been studied in pediatric patients. Use in children should be based on careful consideration of the potential benefits and risks.

## Pregnant Women:

There are no adequate and well-controlled studies of baclofen intrathecal in pregnant women. Baclofen intrathecal has been reported in pregnant women. Use in pregnant women should be based on careful consideration of the potential benefits and risks. Pregnancy monitoring reports on mothers who used baclofen intrathecal during pregnancy. Use in pregnant women should be based on careful consideration of the potential benefits and risks. Pregnancy monitoring resulted in low birth weights according to what would be expected for gestational age. Use in pregnant women should be based on careful dosing pregnancy and the potential benefits to the mother outweigh the potential risk to the fetus.

Infants exposed to baclofen through maternal oral dosing during pregnancy are at risk of experiencing baclofen withdrawal at birth. Infants born to mothers who have been treated with baclofen at dosage appearance of withdrawal symptoms in this population.

## Nursing Women:

Oral baclofen at therapeutic doses passes into breast milk. Baclofen injection should not be used in nursing women unless the potential benefit outweighs the risk.

## Patients with Special Diseases and Conditions

Patients with Parkinson's disease, Alzheimer's disease, or other degenerative disorders of the central nervous system.

Patients suffering from psychotic disorders, schizophrenia, schizoaffective disorder, or Parkinson's disease should be treated cautiously with Baclofen injection and kept under careful surveillance.

## Drug Interactions

Concomitant use of oral baclofen and meperidine, alcohol, or other CNS depressants may result in additive or potentiated effects.

Baclofen injection should be used with caution in patients with a history of autonomic dysreflexia. The presence of neuroplasty scleral or abrupt withdrawal of Baclofen injection may cause an autonomic dysreflexia crisis.

Baclofen injection should be used with caution in patients with cardiovascular or respiratory insufficiency as these conditions may be exacerbated by baclofen.

Interaction of intrathecal baclofen with antidepressants, CNS related medicines, and other medicines. Other listed events include stupor, coma, and respiratory depression. Baclofen injection should be used with caution in patients with a history of psychiatric illness, history of epilepsy, alcohol, or other medicines, and respiratory depression.

## Alcohol and Other Consumption Affecting CNS

The central nervous system depressant effects of alcohol and other medicines such as CNS depressants, tricyclic antidepressants, tranquilizers, benzodiazepines, antihistamines, may be additive to the effects of Baclofen injection. Increased sedation may occur when Baclofen injection is used in combination with medicines affecting CNS depression. Including other muscle relaxants such as tizanidine, synthetic opioids, hypnotics, anesthetics, or alcohol may cause additive CNS depression. Cases of respiratory depression, coma, and death have been reported in patients with severe spasticity of spinal cord origin, especially in patients with cardiovascular functions or essential, especially in patients with cardiopulmonary diseases and respiratory muscle weakness.

## Tricyclic Antidepressants

*** BAUSCH&LOMB BUSTALID ***

0,05 mg/ml, 2,5 mg/ml, et 5 mg/ml.

Pour injection intrathécale et perfusion intrathécale seulement.

**CLASSE THÉRAPEUTIQUE**

Antiparkinsonien

**PHARMACOLOGIE CLINIQUE**

La mode d'action précis de baclofène comme antispasmodique n'est pas connu mais il semble agir au niveau de la moelle épinière. Les mécanismes d'action pharmacologiques ne sont pas connus mais ils diminuent le relâchement des neurotransmetteurs excitateurs des motoneurones spinaux. Il semble que le baclofène agit en inhibant les réactions polysynaptiques et monosynaptiques spinales. Le baclofène est une substance analogue au neurotransmetteur inhibiteur GABA (acide gamma-aminobutyrique) qui agit sur le récepteur GABA-B et non sur les récepteurs GABA-A.

Il se démontre que le baclofène exerce un effet dépresseur général sur le système nerveux central (SNC) et produit des symptômes de sédation avec tolérance, de somnolence, d'ataxie et de dépression respiratoire et cardiovasculaire. Le baclofène exerce également un effet inhibiteur sur les polysynaptiques spinales et sur les réflexes monosynaptiques (d'une durée plus courte).

Dans les atteintes neurologiques qui s'accompagnent de spasmes douloureux et de spasticité, le baclofène diminue la fréquence et la sévérité des spasmes et des contractions musculaires réflexes, les spasmes douloureux, les autoinfections, l'hyperréflexie, le tremus et le clonus, ainsi que l'amélioration de la mobilité et de la force des membres. La spasticité peut aussi diminuer à dosage suffisant à la spasticité.

**Pharmacocinétique de baclofène intrathécal**

**Dose intrathécal**

Le médicament commence généralement à exercer son effet une demi-heure après l'injection intrathécale et atteint son maximum en 4 heures. L'effet antispasmodique maximal se manifeste environ 4 heures après l'administration et peut durer entre 4 et 8 heures. Le retour d'activité, le retour de la spasticité et des spasmes se produit habituellement 2 heures après la dose administrée et la durée des symptômes.

**Perfusion intrathécale continue**

Lorsque antispasmodique se manifeste dans les 0,5 heures qui suivent le début de l'administration de la perfusion continue, elle atteint son maximum environ dans les 2 heures.

**Pharmacocinétique du baclofène intrathécal**

Après injection intrathécale ou bien de baclofène, la concentration de baclofène dans le liquide cérébrospinalien (LCR) est environ 100 fois plus élevée que celle qu'on obtient après l'administration par voie orale.

Après injection intrathécale, la concentration de baclofène dans le LCR diminue et le LCR contient en 4 LCR des concentrations de baclofène environ 10 fois plus élevées que celles qu'on obtient après l'administration par voie orale.

Le pic de dernière pharmacocinétique (baclofène) apparaît environ quatre heures après l'injection intrathécale. Le baclofène, le gradient de concentration de baclofène entre le LCR et le plasma est environ 10 fois plus élevé après l'injection intrathécale qu'après l'administration par voie orale.

La clairance du baclofène intrathécal, calculée à partir d'études intrathécales, est environ 10 fois plus élevée que celle qu'on obtient après l'administration par voie orale. Le baclofène est éliminé principalement par voie rénale et environ 85 % du baclofène administré par voie orale, environ 70 % du baclofène présent dans le LCR et environ 70 % du baclofène présent dans le plasma sont éliminés à l'urine. Le processus d'élimination est rapide et le médicament ne contient pas les résidures de la cumine pendant la durée du traitement.

**Dose intrathécal**

Après une injection ventriculo en dose de 50 ou 100 mg de baclofène chez des patients atteints de spasticité cérébrale, les patients atteint de spasticité cérébrale ont présenté des concentrations de baclofène dans le LCR atteint en 1,5 heures et le LCR des concentrations 10 fois plus élevées que celle qu'on observe après l'administration par voie orale.

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**Dose intrathécal**

Après injection intrathécale en dose de 50 ou 100 mg de baclofène chez des patients atteints de spasticité cérébrale, les patients atteint de spasticité cérébrale ont présenté des concentrations de baclofène dans le LCR atteint en 1,5 heures et le LCR des concentrations 10 fois plus élevées que celle qu'on observe après l'injection intrathécale.

**Perfusion continue**

Une étude menée chez 12 patients ayant présenté une spasticité d'origine cérébrale et ayant reçu une perfusion intrathécale continue de baclofène, les patients ont présenté des concentrations de baclofène dans le LCR environ 100 fois plus élevées que celle qu'on observe après l'administration par voie orale.

L'administration de doses quotidiennes de 24 à 1200 mg en perfusion intrathécale continue produit des concentrations de baclofène dans le LCR environ 100 fois plus élevées que celle qu'on observe après l'administration par voie orale. Les concentrations de baclofène dans le LCR ont atteint des valeurs 2 fois et 10 fois plus élevées que celle qu'on observe dans le LCR après des doses de 1 mg et 2,5 mg