

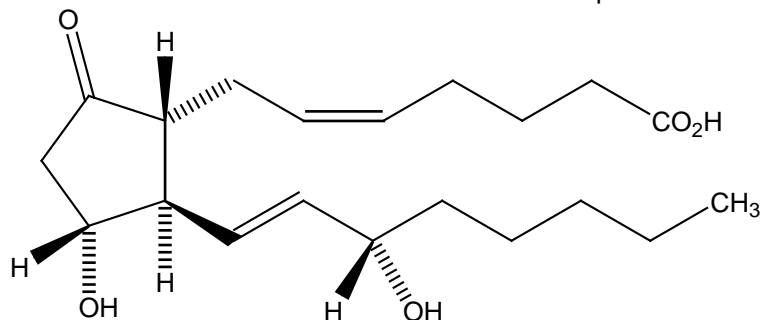
DATA SHEET

CERVIDIL®

NAME OF THE DRUG

Dinoprostone (Prostaglandin E₂)

The chemical name for dinoprostone (commonly known as prostaglandin E₂ or PGE₂) is 11 α -15S-dihydroxy-9-oxo-prosta-5Z,13E-dien-1-oic acid. It is a white to off-white crystalline powder. It has a melting point within the range of 65°C to 69°C. Dinoprostone is soluble in ethanol and in 25% ethanol in water. The structural formula is represented below:



Molecular formula: C₂₀H₃₂O₅

Molecular weight: 352.5

CAS registry number: 363-24-6

DESCRIPTION

CERVIDIL® is a thin, flat, polymeric pessary (vaginal insert) which is rectangular in shape with rounded corners. The pessary (vaginal insert) is contained within the pouch of an off-white knitted polyester retrieval system designed to aid retrieval at the end of the dosing interval.

Each pessary (vaginal insert) contains 10 mg of dinoprostone and releases a mean dose of approximately 0.3 mg dinoprostone per hour over 24 hours. The dinoprostone is dispersed throughout a matrix consisting of 241 mg of hexanetriol/macrogol 8000/isocyanate cross-linked hydrogel copolymer, which is a semi-opaque, beige coloured, flat rectangular pessary (vaginal insert) measuring 29 mm by 9.5 mm and 0.8 mm in thickness. The pessary (vaginal insert) and its retrieval system, made of polyester yarn, are non-toxic and when placed in a moist environment, absorb water, swell, and release dinoprostone.

PHARMACOLOGY

Prostaglandin E₂ (PGE₂) is a naturally occurring compound found in low concentrations in most tissues of the body. It functions as a local hormone.

PGE₂ plays an important role in the complex set of biochemical and structural alterations involved in cervical ripening. Cervical ripening involves a marked relaxation of the cervical smooth muscle fibres of the uterine cervix which must be transformed from a rigid structure to a softened, yielding and dilated configuration to allow passage of the fetus through the birth canal. This process involves activation of the enzyme collagenase which is responsible for digestion of some of the structural collagen network of the cervix.

PHARMACOKINETICS

CERVIDIL® releases PGE₂ to the cervical tissue continuously at a rate which allows cervical ripening to progress until complete (mean dose of approximately 0.3 mg per hour over 24 hours), and with the facility to remove the PGE₂ source when the clinician decides that cervical ripening is complete or labour has started, at which point no further PGE₂ is required. The reservoir of 10 mg dinoprostone serves to maintain a controlled and constant release. The release rate is approximately 0.3 mg per hour over 24 hours in women with intact membranes whereas release is higher and more variable in women with premature rupture of membranes.

Dinoprostone is established as a successful agent for cervical ripening and induction of labour. Dinoprostone initiates labour by a process which may be more akin to spontaneous labour than that produced by forewater amniotomy followed by oxytocin infusion. Local application of dinoprostone (endocervical and vaginal) has proved to be clinically superior to intravenous administration, avoiding gastrointestinal side effects.

Distribution: Using equilibrium dialysis, studies indicate that dinoprostone is approximately 73% bound to human plasma albumin.

Metabolism: Dinoprostone is rapidly metabolised in the lungs, kidneys and liver. Approximately 90% of dinoprostone is metabolised in the first pass. In man, three metabolites of dinoprostone have been identified in plasma, 13,14-dihydro-15-keto GE₂ (the primary metabolite), 11 alpha-hydroxy-9,15-diketoprost-5-enoic acid and 11 alpha-hydroxy-9,15-dioxyprost-5-13-dienoic acid.

Excretion: Dinoprostone is eliminated from the circulation very rapidly. Studies indicate that the half-life of dinoprostone is less than one minute.

The plasma concentration of dinoprostone and its metabolites is low after intravaginally administered PGE₂. The plasma half-life for dinoprostone is less than 1 minute and for its primary metabolite less than 10 minutes. Animal studies have shown that this metabolite (15-keto-13,14-dihydro-PGE₂) is about half as active as the mother substance. Dinoprostone is metabolised in the lung and is excreted via the urine.

CLINICAL TRIALS

Three randomised, double-blind placebo controlled studies have been conducted. Studies 101-003 and 101-103 involved the pessary (vaginal insert) alone, whereas study 101-801 used the pessary (vaginal insert) fitted with retrieval system to facilitate rapid and reliable retrieval of the pessary (vaginal insert). Pharmacokinetic studies had demonstrated that there was no significant difference between the PGE₂ release characteristics of the "netted" and "unnetted" versions of the pessary (vaginal insert).

All three studies involved patients with singleton pregnancies and cephalic presentation, for whom there were medical or obstetrical grounds for the induction of labour, and who had a Bishop score of 4 or less. Patients had to be in at least the 37th week of gestation. On randomisation, patients were stratified according to whether they were primiparous or multiparous.

The efficacy of CERVIDIL[®] as demonstrated in these studies is shown in Table 1:

Table 1 Efficacy of CERVIDIL[®] in Double Blind Studies

Parameter	Study	Primip/Nulliparous		Multiparous		P-Value
		Cervidil	Placebo	Cervidil	Placebo	
Treatment Success*	101-103 (n=81)	65%	28%	87%	29%	<0.001
	101-003 (n=371)	68%	24%	77%	24%	<0.001
	101-801 (n=206)	72%	48%	55%	41%	0.003
Time to Delivery (hrs)						
Average	101-103 (n=81)	33.7	48.6	14.0	28.6	0.001
Median		25.7	34.5	12.3	24.6	
Average	101-801 (n=206)	31.1	51.8	52.3	45.9	<0.001
Median		25.5	37.2	20.8	27.4	
Time to Onset of Labour (hrs)						
Average	101-103 (n=81)	19.9	39.4	6.8	22.4	<0.001
Median		12.0	19.2	6.9	18.3	

*Treatment success was defined as Bishop score increase at 12 hours of ≥ 3 , vaginal delivery within 12 hours or Bishop score at 12 hours ≥ 6 . These studies were not designed with the power to show differences in caesarean section rates between CERVIDIL[®] and placebo groups and none were noted.

INDICATIONS

Cervical ripening in patients, at or near term, who have favourable induction features and in whom there is a medical or obstetrical indication for induction of labour.

CONTRAINDICATIONS

CERVIDIL[®] SHOULD NOT BE USED OR LEFT IN PLACE IN THE FOLLOWING CONDITIONS:

1. When there is known hypersensitivity to dinoprostone or any other constituent of the pessary (vaginal insert) (eg urethane).
2. When the patient is carrying more than one fetus.
3. When labour has started.
4. When oxytocic drugs are being given or if they are to be given intravenously within 30 minutes.
5. When strong prolonged uterine contractions would be inappropriate such as in patients:
 - a. who have had previous major uterine surgery, e.g. caesarean section
 - b. with cephalopelvic disproportion
 - c. with fetal malpresentation

- d. with suspicion or evidence of fetal distress (eg abnormal cardiotocography)
 - e. who have had more than three full term deliveries
 - f. who have had previous cervical surgery or rupture of the cervix
6. When there is current pelvic inflammatory disease, unless adequate prior treatment has been instituted.
 7. Where vaginal delivery is not indicated, eg placenta praevia or active herpes genitalis
 8. When there has been unexplained vaginal bleeding during the pregnancy.
 9. When there is abnormal cardiotocography or suspected fetal compromise.
 10. In the presence of any suggestion of uterine hyperstimulation or hypertonic uterine contractions.

PRECAUTIONS

For hospital use only

CERVIDIL® should be administered only by trained obstetrical personnel in a hospital setting with appropriate obstetrical care facilities.

The condition of the cervix should be assessed carefully before CERVIDIL® is used.

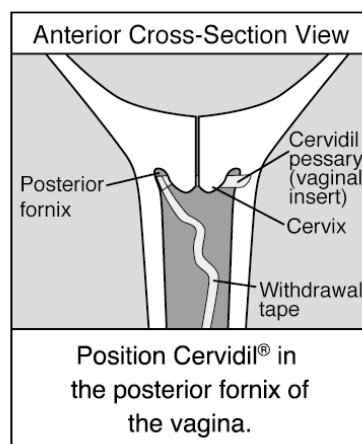
Use with caution in patients with cervical (Bishop) scores of 8 or more.

The experience of CERVIDIL® in patients with ruptured membranes is limited. Therefore, CERVIDIL® should be used with caution in those patients. Since the release of dinoprostone from the insert can be affected in the presence of amniotic fluid, special attention should be given to uterine activity and fetal condition.

Uterine rupture has been reported in association with the use of CERVIDIL®, mainly in patients with contraindicated conditions (see **CONTRAINDICATIONS**). Therefore, CERVIDIL® should not be administered to patients with a history of previous caesarean section or uterine surgery given the potential risk for uterine rupture and associated obstetrical complications.

After insertion, CERVIDIL® should be positioned transversely into the posterior fornix of the vagina (Figure 1). Incorrect positioning of the vaginal insert could lead to the loss of device from the vagina and consequent lack of efficacy, due to insufficient exposure of the cervix to the appropriate sustained concentrations of prostaglandin.

Figure 1



After insertion, uterine activity, fetal condition and the progression of cervical dilatation and effacement must be monitored regularly. CERVIDIL® must only be used if facilities for continuous fetal and uterine monitoring are available. If there is any suggestion of maternal

or fetal complications or if adverse effects occur, the pessary (vaginal insert) should be removed.

Since prostaglandins potentiate the effect of oxytocin, CERVIDIL[®] must be removed before oxytocin administration is initiated (see also **INTERACTIONS**) and the patient's uterine activity carefully monitored for uterine hyperstimulation.

If uterine hyperstimulation is encountered or if labour commences, the pessary (vaginal insert) should be removed immediately. CERVIDIL[®] should also be removed prior to amniotomy.

CERVIDIL[®] should be used with caution in patients with compromised cardiovascular function.

CERVIDIL[®] should be used with caution when the membranes are ruptured.

CERVIDIL[®] should be used with caution in patients with a previous history of uterine hypertony, glaucoma, epilepsy or asthma or unexplained genital bleeding during the current pregnancy.

Medication with non-steroidal anti-inflammatory drugs, including aspirin, should be stopped before administration of PGE₂.

A second dose of CERVIDIL[®] is not recommended, as the effects of a second dose have not been studied.

As with other oxytocic agents, the possibility of uterine rupture should be considered in the presence of excessive uterine activity or unusual uterine pain.

The use of the product in patients with diseases which could affect the metabolism or excretion of dinoprostone, e.g. lung, liver or renal disease, has not been specifically studied. The use of the product in such patients is not recommended.

Women aged 35 and over, women with complications during pregnancy, such as gestational diabetes, arterial hypotension and hypothyroidism, and women at gestational age above 40 weeks have a higher post-partum risk of developing disseminated intravascular coagulation (DIC). These factors may additionally enhance the risk of disseminated intravascular coagulation in women with pharmacologically induced labour (see also **ADVERSE REACTIONS**). Therefore, dinoprostone and oxytocin should be used with caution in these women. In the immediate post-partum phase the physician should continue to monitor for early signs of a developing DIC (e.g. fibrinolysis).

Carcinogenesis, mutagenesis

Long-term carcinogenicity and fertility studies have not been conducted with CERVIDIL[®]. No evidence of mutagenicity has been observed with PGE₂ in the Micronucleus Test, or Ames Test. PGE₂ did induce chromosomal aberrations in Chinese hamster lung fibroblasts in culture but only at an unphysiologically high concentration.

Exposure to PGE₂ at the dosage and administration recommended for induction of labour is not considered to be of toxicological concern. Long term clinical use of chemically related polymers such as those used in the hydrogel and retrieval system has not identified any concerns regarding genotoxicity.

Impairment of fertility

Fertility studies have not been conducted with CERVIDIL[®].

Renal and hepatic impairment

The use of CERVIDIL® in patients with diseases which could affect the metabolism or excretion of PGE₂, e.g. liver or renal disease, has not been specifically studied. The use of CERVIDIL® in such patients is not recommended.

Use in pregnancy and lactation (Category C)

Prostaglandin E₂ has produced an increase in skeletal anomalies in rats and rabbits. No effect would be expected clinically, when used as indicated, since CERVIDIL® is administered after the period of organogenesis. Prostaglandin E₂ has been shown to be embryotoxic in rats and rabbits. Specific fetotoxicity studies of this dose form of PGE₂ have not been conducted. However, an increase in still births was noted when PGE₂ containing pessaries (vaginal inserts) were used in studies in pregnant rats. There has been idiosyncratic sensitivity of the uterus resulting in anoxia. Any dose that produces sustained increased uterine tone could put the embryo or fetus at risk.

The product is for the initiation and/or continuation of cervical ripening in pregnant patients at term only where labour induction is indicated. CERVIDIL® is not indicated for use during early or other phases of pregnancy.

Use in lactation

CERVIDIL® is not indicated for use during lactation.

Interactions with other drugs

Prostaglandins potentiate the uterotonic effect of oxytocic drugs. Concurrent use of CERVIDIL® in patients receiving oxytocics is not recommended. A dosing interval of at least 30 minutes is recommended for the sequential use of oxytocin following the removal of the dinoprostone pessary (vaginal insert) (see also **PRECAUTIONS**). No other drug interactions have been identified.

ADVERSE REACTIONS

CERVIDIL® is well tolerated. In placebo-controlled trials in which 658 women were studied and 320 received active therapy (218 without retrieval system, 102 with retrieval system), the following events were reported.

CERVIDIL® - Drug Related Adverse Events

	Controlled Studies¹	
	Active	Placebo
Uterine hyperstimulation	2.8%	0.3%
Uterine tachysystole	4.7%	0%
Fetal Distress without uterine hyperstimulation	3.8%	1.2%
N	320	338

	Study 101-801²	
	Active	Placebo
Uterine hyperstimulation	2.9%	0%
Uterine tachysystole	2.0%	0%
Fetal Distress without uterine hyperstimulation	2.9%	1.0%
N	102	104

1. Controlled Studies (with and without retrieval system)
2. Controlled Study (with retrieval system)

In Postmarketing Experience Reports, uterine rupture has been reported in association with the use of CERVIDIL®.

Fever, nausea, vomiting, diarrhoea, and abdominal pain were noted in fewer than 1 % of patients who received CERVIDIL®.

Very rarely, cases of genital oedema and anaphylactic reaction have been reported.

In study 101-801 (with the retrieval system) cases of hyperstimulation reversed within 2 to 13 minutes of removal of the product. Tocolytics were required in one of the five cases.

In cases of fetal distress, when product removal was thought advisable, there was a return to normal rhythm and no neonatal sequelae.

Five minute Apgar scores were 7 or above in 98.2% (646/658) of studied neonates whose mothers received CERVIDIL®. In a report of a 3 year paediatric follow-up study in 121 infants, 51 of whose mothers received CERVIDIL®, there were no deleterious effects on physical examination or psychomotor evaluation.

An increased risk of post-partum disseminated intravascular coagulation (DIC) has been reported in patients whose labour was induced by pharmacological means, either with dinoprostone or oxytocin.

DOSAGE AND ADMINISTRATION

Administration

CERVIDIL[®] should be removed from the freezer immediately prior to the insertion. There is no need for prior warming of the product. To remove CERVIDIL[®] from the packaging, first tear the foil along the top of the sachet. Do not use scissors or sharp instruments to cut the foil as this may damage the product. Use the retrieval tape to gently pull the product out of the sachet.

The pessary (vaginal insert) should be inserted immediately after removal from the freezer and its foil package, however, controlled periods of time of up to one month at 2-8°C can be allowed within the shelf life of the product. CERVIDIL[®] must not be used without its retrieval system.

One pessary (vaginal insert) should be inserted high into the posterior vaginal fornix using only small amounts of water soluble lubricants to aid insertion. After CERVIDIL[®] has been inserted, the withdrawal tape may be cut with scissors always ensuring there is sufficient tape outside the vagina to allow removal. No attempt should be made to tuck the end of the tape into the vagina as this may make retrieval more difficult.

The patient should be recumbent for 30 minutes after insertion. As PGE₂ will be released continuously over a period of 24 hours, it is important to monitor uterine contractions and fetal condition at frequent regular intervals.

Removal

The pessary (vaginal insert) can be removed quickly and easily by gentle traction on the retrieval tape. After removal ensure that the entire product, pessary (vaginal insert) and retrieval system, has been removed from the vagina.

It is necessary to remove the pessary (vaginal insert) to terminate drug administration when cervical ripening is judged to be complete or for any of the reasons listed below.

1. Onset of labour. For the purposes of induction of labour with CERVIDIL[®], the onset of labour is defined as the presence of regular painful uterine contractions occurring every 3 minutes irrespective of any cervical change. There are two important points to note:
 - (i) Once regular, painful contractions have been established with CERVIDIL[®], they will not reduce in frequency or intensity as long as CERVIDIL[®] remains *in situ* because PGE₂ is still being administered, nor will they reduce if CERVIDIL[®] is removed because the woman is in labour.
 - (ii) Patients, particularly multigravidae, may develop regular painful contractions without any apparent cervical change. Effacement and dilatation of the cervix may not occur until uterine activity is established. Because of this, once regular painful uterine activity is established with CERVIDIL[®] *in-situ*, the pessary (vaginal insert) should be removed irrespective of cervical state to avoid the risk of uterine hyperstimulation.
2. Spontaneous rupture of the membranes or amniotomy.
3. Any suggestion of uterine hyperstimulation or hypertonic uterine contractions.
4. Evidence of fetal distress.
5. Evidence of maternal systemic adverse PGE₂ effects such as nausea, vomiting, hypotension or tachycardia.
6. At least 30 minutes prior to starting an intravenous infusion of oxytocin.
7. If there has been insufficient cervical ripening in 24 hours.

On removal of the product from the vagina, the pessary (vaginal insert) will have swollen to 2-3 times its original size and be pliable. The whole product should be disposed of as clinical waste.

OVERDOSAGE

CERVIDIL[®] is used as a single dosage in a single application. Overdosage is usually manifested by uterine hyperstimulation which may be accompanied by fetal distress and is responsive to removal of the pessary (vaginal insert). Other treatment must be symptomatic since, to date, clinical experience with prostaglandin antagonists is insufficient.

The use of beta-adrenergic agents should be considered in the event of undesirable increased uterine activity, if removal does not diminish the undesirable uterine activity.

PRESENTATION

CERVIDIL[®] is presented in an individual, sealed aluminium/polyethylene laminate sachet containing 1 pessary (vaginal insert).

The hydrogel polymer of CERVIDIL[®] is prepared with Polyethylene glycol 8000, Dicyclohexyl methane-4, 4'-diisocyanate and 1,2,6-Hexanetriol. The hydrogel polymer pessary is contained in a polyester retrieval system.

STORAGE

Store in a freezer below -18°C. The pessary (vaginal insert) should be inserted immediately after removal from the freezer and its foil package, however, controlled periods of time of up to one month at 2-8°C can be allowed within the shelf life of the product.

Pessaries (vaginal inserts) exposed to high humidity will absorb moisture from the air and thereby alter the release characteristics of dinoprostone. Once used, the pessary (vaginal insert) should be discarded.

MEDICINE CLASSIFICATION

Prescription Medicine

SPONSOR

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DATE OF PREPARATION

June 2006

CERVIDIL[®] is the registered trademark of Controlled Therapeutics (Scotland) Ltd.