

## PRODUCT INFORMATION

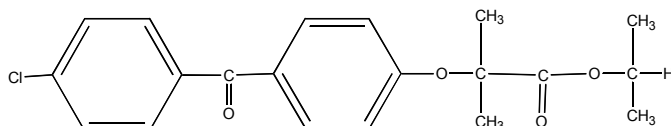
### LIPIDIL<sup>®</sup>

#### NAME OF THE MEDICINE

##### Non-proprietary Name

Fenofibrate

##### Chemical Structure



##### CAS Number

49562-28-9

#### DESCRIPTION

Fenofibrate is a fibric acid derivative. Chemical name: 2-[4-(4-chlorobenzoyl) phenoxy]-2-methylpropanoic acid, 1-methylethyl ester. The empirical formula is C<sub>20</sub>H<sub>21</sub>O<sub>4</sub>Cl. MW: 360.83. Fenofibrate is a white solid powder, stable under ordinary conditions and practically insoluble in water. The melting point is 79-82°C.

Lipidil 48 mg tablets contain 48 mg of fenofibrate nanoparticles. The tablets also contain sucrose, hypromellose, sodium laurylsulfate, lactose, cellulose microcrystalline, silica - colloidal anhydrous, crospovidone, docusate sodium, magnesium stearate. The film coating for the tablets consists of polyvinyl alcohol, titanium dioxide, purified talc, lecithin and xanthan gum and indigo carmine CI 73015 (aluminum lake), quinoline yellow CI 47005 (aluminum lake) and sunset yellow FCF CI 15985 (aluminum lake) as colouring agents.

Lipidil 145 mg tablets contain 145 mg of fenofibrate nanoparticles. The tablets also contain sucrose, hypromellose, sodium laurylsulfate, lactose, cellulose microcrystalline, silica - colloidal anhydrous, crospovidone, docusate sodium, magnesium stearate. The film coating for the tablets consists of polyvinyl alcohol, titanium dioxide, purified talc, lecithin and xanthan gum.

#### PHARMACOLOGY

The majority of clinical trials have been conducted with a micronised fenofibrate 200 mg capsule formulation. The micronised fenofibrate 200 mg capsule, 3 tablets of 48 mg and the 145 mg tablet have been demonstrated to be bioequivalent in a bioequivalence study carried out under fed conditions.

##### Pharmacodynamics

The lipid-lowering properties of fenofibrate seen in clinical practice have been explained in vivo in transgenic mice and in human hepatocyte cultures by the activation of Peroxisome Proliferator Activated Receptor type a (PPAR $\alpha$ ). Through this mechanism, fenofibrate increases lipolysis and elimination of triglyceride-rich particles from plasma by activating lipoprotein lipase and reducing production of Apoprotein C-III. Activation of PPAR $\alpha$  also induces an increase in the synthesis of Apoproteins A-I, A-II and of HDL cholesterol.

The above stated effects of fenofibrate on lipoproteins lead to a reduction in the very low- and low-density (VLDL and LDL) fractions containing apoprotein B and to an increase in the high density lipoprotein (HDL) fraction containing apoprotein AI and AII.

In addition, through modulation of the synthesis and the catabolism of VLDL fractions fenofibrate increases the LDL clearance and reduces small dense LDL, the levels of which are elevated in the atherogenic lipoprotein phenotype, a common disorder in patients at risk of coronary heart

disease. Extravascular deposits of cholesterol (tendinous and tuberous xanthoma) may be markedly reduced or even entirely eliminated during fenofibrate therapy. The uricosuric effect of fenofibrate leading to reduction in uric acid levels of approximately 25% should be of additional benefit in those dyslipidaemic patients with hyperuricaemia.

## **Pharmacokinetics**

### Absorption and Bioavailability

Unlike that observed for Lipidil 160 mg tablets and 67 mg and 200 mg capsules, in which the absorption of fenofibrate is increased significantly when administered with food, the rate and extent of absorption of fenofibrate from Lipidil 48 mg and 145 mg tablets is not significantly affected by food. A food-effect study involving administration of the new 145 mg tablet formulation of fenofibrate to healthy male and female subjects under fasting conditions and with a high fat meal indicated that exposure (AUC and C<sub>max</sub>) to fenofibric acid is not affected by food. Therefore, LIPIDIL 145 mg and 48 mg tablets may be taken without regard to meals.

The nanosized formulation of Lipidil 145 mg and Lipidil 160 mg are bioequivalent in respect of AUC and C<sub>max</sub> under low fat fed conditions. The average C<sub>max</sub> of Lipidil 145 mg is 15.5% higher than that from 160 mg tablets and its median T<sub>max</sub> significantly shorter (2.9 and 3.7 hours for Lipidil 145 mg and 160 mg respectively).

### Distribution

After oral administration, fenofibrate is rapidly hydrolysed by esterases to the active metabolite fenofibric acid. Unchanged fenofibrate is not recovered in the plasma. Fenofibric acid, the major plasma metabolite, is highly bound to plasma albumin (more than 99%).

Peak plasma concentration occurs after a mean period of 2 to 4 hours following administration of 145 mg fenofibrate tablets. Kinetic studies after administration of repeated doses show the absence of accumulation of the product. The plasma half-life of elimination of fenofibric acid is approximately 20 hours.

### Excretion

The product is mainly excreted in the urine: 70% in 24 hours and 88% in 6 days, at which time total excretion in urine and faeces reaches 93%. Fenofibrate is mainly excreted as fenofibric acid and its derived glucuronconjugate. Fenofibric acid is not eliminated during haemodialysis.

## **CLINICAL TRIALS**

### **Dyslipidaemia**

During clinical trials with fenofibrate total cholesterol was reduced by 20 to 25%, triglycerides by 40-50% and HDL cholesterol was increased by 10 to 30%. In hypercholesterolaemic patients, where LDL cholesterol levels were reduced by 20 to 30%, the overall effect on cholesterol resulted in a decrease in the ratios of total cholesterol to HDL cholesterol, LDL cholesterol to HDL cholesterol, and Apo B to Apo AI, all of which are markers of atherogenic risk. Patients with raised levels of fibrinogen treated with fenofibrate have shown significant reductions in this parameter, as have those with raised levels of Lp(a). Other inflammatory markers such as C Reactive Protein are reduced with fenofibrate treatment.

The long-term effects of fenofibrate were assessed in an open-label, prospective six month trial that examined the efficacy of fenofibrate 145 mg/day equivalent (see 'Pharmacology') in 1334 patients with type IIa, IIb or IV dyslipidaemia. The results of the trial are summarized in Table 1.

**Table 1: Change in lipid parameters compared to baseline after 6 months**

<b>Parameter (mmol/L):</b>	<b>Baseline</b>	<b>Month 6</b>	<b>Absolute change</b>
<b>Type IIa patients:</b>			
LDL-C	5.55	3.98	-1.57
Total Cholesterol	7.68	6.05	-1.63
HDL-C	1.47	1.57	0.10
Triglycerides	1.46	1.10	-0.36
<b>Type IIb patients:</b>			
LDL-C	5.25	4.15	-1.10
Total Cholesterol	7.91	6.39	-1.52
HDL-C	1.15	1.32	0.17
Triglycerides	3.77	2.11	-1.66
<b>Type IV patients:</b>			
LDL-C	3.24	3.12	-0.12
Total Cholesterol	7.65	6.13	-1.52
HDL-C	0.95	1.13	0.18
Triglycerides	3.72	2.60	-1.12

#### DAIS Study

The Diabetes Atherosclerosis Intervention Study (DAIS) was a double-blind, randomised, placebo-controlled study in 418 patients with type 2 diabetes and hyperlipoproteinaemia. Patients were randomised to fenofibrate 145 mg/day equivalent (see 'Pharmacology') or placebo for at least 3 years. Patients had stable glycaemic control, (mean HbA1c 7.5%), mild lipoprotein abnormalities typical of type 2 diabetes and at least one visible coronary lesion.

The primary efficacy criterion was the mean segment diameter averaged per patient across all pairs of analysable coronary segments, a criterion believed to reflect diffuse coronary artery disease. Among the secondary criteria were other angiographic parameters (mean diameter averaged per segment and minimum segment diameter averaged per patient and per segment).

Results (see Table 2) showed that fenofibrate significantly reduces the angiographic progression of focal coronary atherosclerosis characterized by minimum segment diameter and percent diameter stenosis in patients with type 2 diabetes and hyperlipoproteinaemia (mean total cholesterol 5.57 mmol/L, triglycerides 2.54 mmol/L, LDL cholesterol 3.37 mmol/L and HDL-cholesterol 1.03 mmol/L).

The reduction in the progression of angiographic coronary disease was associated with a reduction in lipid parameters (total cholesterol, LDL-cholesterol, triglycerides, TC/HDL-C), and an increase in HDL-cholesterol and therefore results apply to patients who respond to treatment. This trial did not assess whether the observed change in angiographic endpoints, particularly in asymptomatic patients, had any effect on cardiovascular events or mortality.

**Table 2: Coronary angiogram values (mean ± SD) averaged per patient at baseline and at the end of study (ITT population)**

	<b>Fenofibrate (n=207)</b>	<b>Placebo (n=211)</b>	<b>p-values*</b>
Mean segment diameter (mm)			
Baseline	2.70 ± 0.45	2.67 ± 0.45	0.494
End of study	2.62 ± 0.49	2.56 ± 0.50	0.173
Minimum segment diameter (mm)			
Baseline	2.14 ± 0.44	2.10 ± 0.44	0.457

End of study	2.05 ± 0.46	1.98 ± 0.48	0.028
Percent diameter stenosis (%)			
Baseline	21.80 ± 7.8	21.80 ± 7.4	0.958
End of study	24.10 ± 9.8	25.70 ± 10.8	0.020

\*p-values for Student's t test and for covariance analysis to compare treatment groups respectively at baseline and at the end of study

## FIELD

The Fenofibrate Intervention and Event Lowering in Diabetes (FIELD) study was a 5-year randomised, placebo-controlled study of 9795 patients with type 2 diabetes mellitus treated with fenofibrate. Fenofibrate demonstrated a non-significant 11% relative reduction in the primary outcome of coronary heart disease events (hazard ratio [HR] 0.89, 95% CI 0.75- 1.05, p=0.16) and a significant 11% relative reduction in the secondary outcome of total cardiovascular disease events (HR 0.89 [0.80-0.99], p=0.04). There was a non-significant 11% (HR 1.11 [0.95-1.29], p=0.18) and 19% (HR 1.19, [0.90-1.57]; p=0.22) relative increase in total and coronary heart disease mortality, respectively, with fenofibrate as compared with placebo.

## ACCORD-lipid

The Action to Control Cardiovascular Risk in Diabetes Lipid (ACCORD Lipid) trial was a randomised placebo-controlled study of 5518 patients with type 2 diabetes mellitus on background statin therapy treated with fenofibrate.

Fenofibrate plus simvastatin therapy did not show any significant differences compared to simvastatin monotherapy in the composite primary outcome of non-fatal myocardial infarction, non-fatal stroke, and cardiovascular death (hazard ratio [HR] 0.92, 95% CI 0.79-1.08, p = 0.32; absolute risk reduction: 0.74%). In the pre-specified subgroup of dyslipidaemic patients, defined as those in the lowest tertile of HDL-C ( $\leq 0.88$  mmol/L) and highest tertile of TG ( $\geq 2.3$  mmol/L) at baseline, fenofibrate plus simvastatin therapy demonstrated a 31% relative reduction compared to simvastatin monotherapy for the composite primary outcome (hazard ratio [HR] 0.69, 95% CI 0.49-0.97, p = 0.03 ; absolute risk reduction: 4.95%). Another pre-specified subgroup analysis identified a statistically significant treatment-by-gender interaction (p = 0.01) indicating a possible treatment benefit of combination therapy in men (p=0.037) but a potentially higher risk for the primary outcome in women treated with combination therapy compared to simvastatin monotherapy (p=0.069). This was not observed in the aforementioned subgroup of patients with dyslipidaemia but there was also no clear evidence of benefit in dyslipidaemic women treated with fenofibrate plus simvastatin, and a possible harmful effect in this subgroup could not be excluded.

Epidemiological studies have demonstrated a positive correlation between increased serum lipid levels and an increased risk of coronary heart disease. The control of such dyslipidaemias forms the rationale for treatment with fenofibrate. There is evidence that treatment with fibrates may reduce coronary heart disease events but fenofibrate has not been shown to decrease all-cause mortality in the primary or secondary prevention of cardiovascular disease.

Fenofibrate was not shown to reduce coronary heart disease morbidity and mortality in patients with type 2 diabetes mellitus overall.

## **Diabetic Retinopathy**

### FIELD-PSP-DR

In the (FIELD) study information on laser treatment for diabetic retinopathy—a pre-specified tertiary endpoint of the main study—was collected at each study visit for all study patients. The requirement for first laser treatment for all retinopathy was significantly lower in the fenofibrate group than in the placebo group (164 [3.4%] vs. 238 [4.9%]; hazard ratio [HR] 0.69, 95% CI 0.56–

0.84;  $p=0.0002$ ; absolute risk reduction [ARR] 1.5% [0.7–2.3]). The reduction in the need for laser in the fenofibrate treatment group was not related to baseline plasma lipid concentrations.

In the FIELD sub-study of 1012 patients (FIELD PSP-DR), standardised retinal photographs were taken and graded according to the Early Treatment Diabetic Retinopathy Study (ETDRS) criteria to determine the cumulative incidence of diabetic retinopathy and its component lesions. Analyses were by intention to treat. The primary endpoint of 2-step progression of EDTRS grade did not differ significantly between the two groups overall (46 [9.6%] patients on fenofibrate vs. 57 [12.3%] on placebo;  $p=0.19$ ) or in the subset of patients without pre-existing retinopathy (43 [11.4%] vs. 43 [11.7%];  $p=0.87$ ). By contrast, in patients with pre-existing retinopathy, significantly fewer patients on fenofibrate had a 2-step progression than did those on placebo (three [3.1%] patients vs. 14 [14.6%];  $p=0.004$ ). The composite endpoint of 2-step progression of EDTRS grade, macular oedema, or laser treatments was significantly lower in fenofibrate treated group (HR 0.66, 95% CI 0.47–0.94;  $p=0.022$ ).

### ACCORD-eye

A subgroup of 1593 participants of the ACCORD lipid trial (ACCORD-eye) was evaluated for the effects of treatment with fenofibrate and simvastatin compared to treatment with simvastatin plus a placebo at 4 years on the progression of diabetic retinopathy by 3 or more steps on the Early Treatment Diabetic Retinopathy Study (ETDRS) Severity Scale (as assessed from seven-field stereoscopic fundus photographs, with 17 possible steps and a higher number of steps indicating greater severity) or the development of diabetic retinopathy necessitating laser photocoagulation or vitrectomy.

The progression of diabetic retinopathy was 6.5% with fenofibrate for intensive dyslipidaemia therapy, versus 10.2% with placebo for standard dyslipidaemia therapy (adjusted odds ratio, 0.60; 95% CI, 0.42 to 0.87;  $P = 0.006$ ). It was concluded that intensive combination treatment of dyslipidaemia reduced the rate of progression of diabetic retinopathy.

An integrated analysis was performed from Patient individual Data from the FIELD study and the published information from ACCORD-Eye publications. The combined primary endpoint of ACCORD-Eye was applied to FIELD i.e. 3-step ETDRS severity scale, photocoagulation or vitrectomy for proliferative diabetic retinopathy. The two studies were homogeneous (fixed effect model applicable) and showed an overall 60% reduction in the progression of diabetic retinopathy, OR: 0.40; 95% CI (0.26-0.61) for the subjects with existing DR at baseline.

Neither FIELD nor ACCORD-Eye showed an improvement in visual acuity.

FIELD and ACCORD excluded patients with severe non-proliferative and proliferative diabetic retinopathy at baseline.

## **INDICATIONS**

Lipidil is indicated as an adjunct to diet in the treatment of:

- hypercholesterolaemia;
- types II, III, IV and V dyslipidaemia;
- dyslipidaemia associated with type 2 diabetes.

Lipidil is indicated for the reduction in the progression of diabetic retinopathy in patients with type 2 diabetes and existing diabetic retinopathy. Lipidil does not replace the appropriate control of blood pressure, blood glucose and blood lipids in reducing the progression of diabetic retinopathy.

## **CONTRAINDICATIONS**

Lipidil is contra-indicated in:

- children



- patients with liver dysfunction, including primary biliary cirrhosis and unexplained persistent liver function abnormality;
- patients with severe renal dysfunction;
- patients with existing gallbladder disease;
- co-administration with another fibrate,
- patients hypersensitive to fenofibrate and in cases of known photoallergy or phototoxic reactions during treatment with fibrates or ketoprofen
- chronic or acute pancreatitis with the exception of acute pancreatitis due to severe hypertriglyceridaemia.

## **PRECAUTIONS**

Initial therapy: Laboratory analysis should be performed to ascertain that the lipid levels are consistently abnormal before instituting Lipidil therapy. Every attempt should be made to control serum lipids with appropriate diet, exercise, weight loss in obese patients, and control of any medical problems such as diabetes mellitus and hypothyroidism that are contributing to the lipid abnormalities. Medications known to exacerbate hypertriglyceridemia (beta-blockers, thiazides, oestrogens) should be discontinued or changed if possible prior to consideration of triglyceride-lowering drug therapy.

Continued therapy: Periodic determinations of serum lipids should be obtained during initial therapy in order to establish the lowest effective dose of Lipidil. If an adequate response has not been achieved after three months of treatment with the maximum recommended dose of one 145 mg tablet per day, complementary or different therapeutic measures should be considered.

Mortality and Coronary Heart Disease Morbidity: The effects of fenofibrate on coronary heart disease morbidity and mortality and non-cardiovascular mortality have not been established (see Clinical Trials, FIELD and ACCORD studies). Fenofibrate was not shown to reduce coronary heart disease morbidity and mortality in patients with type 2 diabetes mellitus overall.

Renal impairment: In renal dysfunction (eGFR<60 mL/min/1.73 m<sup>3</sup> or CrCl<60 mL/min) the dose of fenofibrate may need to be reduced (see 'Dosage & Administration'). This should also be considered in elderly patients with impaired renal function.

Serum Creatinine: Elevations in serum creatinine have been reported in patients on fenofibrate. These elevations tend to return to baseline following discontinuation of fenofibrate. The clinical significance of these observations is unknown. In the FIELD study, plasma creatinine remained on average 10-12 micromol/L higher on fenofibrate than in the placebo group from 4 months after randomisation until the end of the study. It is recommended that creatinine is measured during the first 3 months after initiation of treatment and thereafter periodically. Monitoring of creatinine should also be considered for patients taking fenofibrate at risk for renal insufficiency such as the elderly and patients with diabetes. Treatment should be interrupted in case of an increase in creatinine levels > 50% of upper limit of normal).

Liver Function: Increased liver function test abnormalities have been observed during fenofibrate therapy (see 'Adverse Effects'). Clinically significant liver injury has been reported rarely. Hepatocellular, chronic active and cholestatic hepatitis associated with fenofibrate therapy have been reported after exposures of weeks to several years. In extremely rare cases, cirrhosis has been reported in association with chronic active hepatitis. The incidence of liver function test abnormalities or hepatic injury when fenofibrate is administered in combination with other potentially hepatotoxic agents has not been studied.

Transaminases: Fenofibrate at doses equivalent to 145 mg per day has been associated with increases in serum transaminases [AST (SGOT) or ALT (SGPT)]. When transaminase determinations were followed either after discontinuation of treatment or during continued treatment, a return to normal limits was usually observed. The incidence of increases in transaminases related to fenofibrate therapy appears to be dose related. Baseline and ongoing monitoring (every 3 months during the first 12 months of treatment and thereafter periodically) of

liver function should be performed for the duration of fenofibrate therapy. Therapy should be discontinued if AST (SGOT) and ALT (SGPT) levels increase to more than 3 times the upper limit of the normal range. Also, if symptoms indicative of hepatitis occur (e.g. jaundice, pruritus), and diagnosis is confirmed by laboratory testing, fenofibrate therapy should be discontinued.

**Cholelithiasis:** Fenofibrate, like clofibrate and gemfibrozil, may increase cholesterol excretion into the bile, leading to cholelithiasis. If cholelithiasis is suspected, gallbladder studies are indicated. Lipidil therapy should be discontinued if gallstones are found.

**Myopathy:** There have been reports of elevations (sometimes marked) of creatine phosphokinase (CPK), myositis and myopathy associated with fibrates as well as other systemically absorbed lipid modifying drugs. Rhabdomyolysis has also been reported rarely. Patients receiving fenofibrate and complaining of muscle pain, tenderness or weakness should have prompt medical evaluation for myositis, including serum creatinine level determination. If myositis is suspected or if CPK rises to  $\geq 5$  times the upper limit of normal, fenofibrate therapy should be withdrawn. Patients with pre-disposing factors for myopathy and/or rhabdomyolysis, including age above 70 years old, personal or familial history of hereditary muscular disorders, renal impairment, hypoalbuminaemia, hypothyroidism and high alcohol intake, may be at an increased risk of developing rhabdomyolysis. For these patients, the putative benefits and risks of fenofibrate therapy should be carefully weighed up. The risk of serious muscle toxicity is increased if fenofibrate is used concomitantly with HMG-CoA reductase inhibitors or other fibrates (see 'Interactions with Other Medicines').

**Pancreatitis:** Pancreatitis has been reported in patients taking fenofibrate, gemfibrozil, and clofibrate. This occurrence may represent a failure of efficacy in patients with severe hypertriglyceridemia, a direct drug effect, or a secondary phenomenon mediated through biliary tract stone or sludge formation with obstruction of the common bile duct (see 'Adverse Effects').

**Oestrogens:** For hyperlipidaemic patients taking oestrogens or contraceptives containing estrogen it should be ascertained whether the hyperlipidaemia is of primary or secondary nature (possible elevation of lipid values caused by oral oestrogen).

Patients with rare hereditary problems of fructose and galactose intolerance, the Lapp lactase deficiency or glucose-galactose malabsorption should not take this medicine.

Lipidil should not be taken in patients allergic to lecithin or related products due to the risk of hypersensitivity reactions.

**Venothromboembolic Disease:** In the FIELD trial, pulmonary embolus (PE) and deep vein thrombosis (DVT) were observed at higher rates in the fenofibrate- than the placebo-treated group. Of 9,795 patients enrolled in FIELD, there were 4,900 in the placebo group and 4,895 in the fenofibrate group. For DVT, there were 48 events (1%) in the placebo group and 67 (1.4%) in the fenofibrate group ( $p = 0.074$ ); and for PE, there were 32 (0.7%) events in the placebo group and 53 (1.1%) in the fenofibrate group ( $p = 0.022$ ).

### **Effects on Fertility**

Fertility was not affected in rats at oral doses up to 300 mg/kg/day. Based on AUC after single PO dose in rats, the exposure at 300 mg/kg/day is approximately 16x the clinical exposure at steady state.

### **Use in Pregnancy**

#### **Category B3**

There are no adequate and well-controlled studies in pregnant women. Embryofetal toxicity was observed in animals (see below). It is recommended that fenofibrate should not be administered to pregnant women.

In rats, fenofibrate treatment during organogenesis (gestation days 6-15) caused an increase in fetal abnormalities (domed head, rounded body, hunched shoulders, supernumerary ribs and misshapen vertebrae) at 300 mg/kg/day and stunting at 150 and 300 mg/kg/day (approximately 10x and 16x the clinical exposure based on AUC, respectively). When administered to rats during gestation and lactation, fenofibrate prolonged gestation, increased stillbirths and reduced birth weight, pup weight gain and survival at 300 mg/kg/day PO, and decreased birth weight, pup

survival and pup weight gain at 75 mg/kg/day PO (approximately 6x the clinical exposure based on AUC). The above findings were associated with maternal toxicity (decreased body weight gain). In rabbits, fenofibrate caused abortion at 150 and 300 mg/kg/day and increased fetal deaths at 300mg/kg/day, associated with maternal body weight loss at 300 mg/kg/day (not at 150 mg/kg/day). The oral doses of 150 and 300 mg/kg/day in rabbits were 12.5x and 25x the MRCD, based on BSA.

### **Use in Lactation**

It is not known whether fenofibrate is excreted into human milk. Fenofibrate should not be administered to breastfeeding women.

As described above in the 'Use in Pregnancy' section, fenofibrate treatment during gestation and lactation in rats at oral doses of 75 and 300 mg/kg/day decreased pup survival and pup weight gain.

### **Carcinogenicity**

The carcinogenic potential of fenofibrate was investigated in mice and rats. In two carcinogenicity studies in rats at dietary doses of 10, 45 and 200 mg/kg/day (24-month study) or 10 and 60 mg/kg/day (27-month study), the incidence of liver carcinomas and/or adenomas was increased at <sup>3</sup>45 mg/kg/day (<sup>3</sup>4x the clinical exposure, based on AUC) in the 24-month study. Increased incidence of pancreatic acinar cell tumours (carcinomas and/or adenomas) occurred in males in both studies at <sup>3</sup>45 mg/kg/day and increased testicular Leydig cell tumours in both studies at <sup>3</sup>60 mg/kg/day (<sup>3</sup>5x the clinical exposure, based on AUC). In two mouse studies at fenofibrate doses 10, 45 and 200 mg/kg/day (18-month study) or 10, 60 and 200 mg/kg/day (21-month study), the incidence of liver tumours (hepatocellular adenomas and/or carcinomas) was increased in the 18-month study at all doses (0.2x to 4.5x the maximum recommended clinical dose (MRCD) adjusted for body surface area (BSA)), and in the 21-month study at <sup>3</sup>60 mg/kg/day (1.4x the MRCD adjusted for BSA). Electron microscopy studies have demonstrated peroxisomal proliferation following fenofibrate administration to the rat. These changes are specific to small rodents and have not been observed in other animal species. This is of no relevance to therapeutic use in man.

### **Genotoxicity**

Fenofibrate did not induce gene mutation in bacteria or mouse lymphoma cells *in vitro*, or chromosome aberration in CHO cells *in vitro* or rat bone marrow cells *in vivo*. Nor did it cause DNA damage in rat hepatocytes *in vitro*.

### **Interactions with Other Medicines**

#### Oral Anti-coagulants

Fenofibrate enhances oral anticoagulant effect and may increase risk of bleeding. It is recommended that the dose of anticoagulants is reduced by about one third at the start of treatment and then gradually adjusted if necessary according to INR (International Normalised Ratio) monitoring.

#### HMG-CoA Reductase Inhibitors

There have been reports of severe myositis and myoglobinuria (rhabdomyolysis) when fenofibrate and HMG-CoA reductase inhibitors were used concurrently. The risk of serious muscle toxicity is increased if fenofibrate is used concomitantly with HMG-CoA reductase inhibitors. This reaction may occur at any point throughout therapy. Such combination therapy should be used with caution in patients with severe combined dyslipidemia and high cardiovascular risk without any history of muscular disease and patients monitored closely for chronic signs of muscle toxicity although toxicity may occur even in the presence of such monitoring. However, data from fenofibrate- HMG-CoA Reductase Inhibitors interaction studies have shown that, contrary to gemfibrozil, the co-administration of fenofibrate with pravastatin, atorvastatin and simvastatin is associated with moderate pharmacokinetic interactions.



- Pravastatin: concomitant administration of fenofibrate (dose equivalent to Lipidil 145 mg tablet once daily over 10 days) and pravastatin (40 mg once daily for 15 days) resulted in an increase of the mean AUC and C<sub>max</sub> for pravastatin by 27 and 36%, respectively and its metabolite 3-hydroxy-iso-pravastatin (which activity represents only 2,5 to 10% of the activity of pravastatin) by 39 and 55%, respectively. The clinical significance of this finding has not been studied. A previous single dose study showed that pravastatin had no effect on the pharmacokinetics of fenofibric acid.

- Atorvastatin: concomitant administration over 10 days of fenofibrate (dose equivalent to Lipidil 145 mg tablet once daily) and atorvastatin (20 mg once daily) resulted in a slight decrease in the mean atorvastatin AUC (14%). Atorvastatin C<sub>max</sub> was not affected by fenofibrate. The pharmacokinetics of fenofibric acid was not significantly modified by atorvastatin (-3% and 4% for AUC and C<sub>max</sub>, respectively).

- Simvastatin: concomitant administration of fenofibrate (160 mg tablet once daily for 10 days) and simvastatin (single dose of 40 mg taken simultaneously with the last dose of fenofibrate) resulted in no significant change in simvastatin AUC (-8%), but in significant decrease in simvastatin acid AUC (-42%) the main active metabolite. However, recently published data, while showing similar PK results, provide data on HMG CoA reductase inhibition, and show that despite the significant reduction in exposure to simvastatin acid, the pharmacological activity of simvastatin measured by active HMGC<sub>o</sub>A reductase inhibitors, is not significantly impacted by concomitant treatment with fenofibrate. No significant effect was observed on C<sub>max</sub>. The pharmacokinetics of fenofibric acid was not significantly modified by simvastatin (+14% for C<sub>min</sub>).

Patients receiving fenofibrate and complaining of muscle pain, tenderness or weakness should have prompt medical evaluation for myositis, including serum creatinine level determination. If myositis is suspected or diagnosed, fenofibrate therapy should be withdrawn.

#### Fibrates

The risk of serious toxicity is increased if fibrates are used concomitantly. Such combination therapy is contraindicated (see Contraindications).

#### Cyclosporin

Some severe cases of reversible renal function impairment have been reported during concomitant administration of fenofibrate and cyclosporin. The renal function of these patients must therefore be closely monitored and treatment with fenofibrate stopped in the case of a severe alteration of laboratory parameters.

#### Other concomitant therapy

The potential for fenofibrate/fenofibric acid to affect the metabolism of other drugs has not been fully investigated *in vitro* or *in vivo*. Interactions cannot be predicted, and therefore, caution is therefore recommended if fenofibrate is combined with other drugs. *In vitro* studies using human liver microsomes indicate that fenofibrate and fenofibric acid are not inhibitors of cytochrome (CYP) P450 isoforms CYP3A4, CYP2D6, CYP2E1, or CYP1A2 dependent metabolism, weakly inhibits CYP2C19 and CYP2A6 dependent metabolism, and exhibits a mild-to-moderate inhibition of CYP2C9 dependent metabolism at therapeutic concentrations. *In vitro* interaction studies suggest displacement of phenylbutazone from plasma protein binding sites.

### **ADVERSE EFFECTS**

The frequencies of adverse events are ranked according to the following: Very common (>1/10); common (>1/100, <1/10); uncommon (>1/1,000, <1/100); rare (>1/10,000, <1/1,000); very rare (<1/10,000), including isolated reports.

#### Gastrointestinal disorders:

Common: Digestive, gastric or intestinal disorders (abdominal pain, nausea, vomiting, diarrhoea, and flatulence) moderate in severity

Uncommon: pancreatitis\*

Hepato-biliary disorders:

Common: Moderately elevated levels of serum transaminases

Uncommon: Development of gallstones

Rare: episodes of hepatitis. When symptoms (e.g. jaundice, pruritus) indicative of hepatitis occur, laboratory tests are to be conducted for verification and fenofibrate discontinued, if applicable

Skin and subcutaneous tissue disorders:

Uncommon: rashes, pruritus, urticaria or photosensitivity reactions

Rare: alopecia

Very rare: cutaneous photosensitivity with erythema, vesiculation or nodulation on parts of the skin exposed to sunlight or artificial UV light (e.g. sunlamp) in individual cases (even after many months of uncomplicated use)

Musculoskeletal, connective tissue and bone disorders:

Uncommon: diffuse myalgia, myositis, muscular cramps and weakness

Very rare: rhabdomyolysis

Cardiovascular system

Uncommon: Thromboembolism (pulmonary embolism, deep vein thrombosis).

Blood and lymphatic system disorders:

Rare: decrease in haemoglobin and leukocytes

Nervous system disorders:

Rare: sexual asthenia, headache

Respiratory, thoracic and mediastinal disorders:

Very rare: interstitial pneumopathies

Investigation:

Uncommon: Increases in serum creatinine and urea.

\*In the FIELD-study, a randomised placebo-controlled trial performed in 9795 patients with type 2 diabetes mellitus, a statistically significant increase in pancreatitis cases was observed in patients receiving fenofibrate versus patients receiving placebo (0.8% versus 0.5%; p = 0.031).

Adverse events reported by 1% or more of patients with dyslipidemia or type 2 diabetes treated with fenofibrate during double blind, placebo-controlled trials, regardless of causality, at the time of registration are listed in Table 3.

**Table 3: Adverse events reported by 1% or more of patients with dyslipidemia or type 2 diabetes treated with fenofibrate during double blind, placebo-controlled trials, regardless of causality.**

Adverse events	Dyslipidemia		Type 2 diabetes	
	fenofibrate N= 473 (%)	Placebo N= 397 (%)	fenofibrate N=207 (%)	Placebo N=211 (%)
Body as a whole	20.3	20.1	65.7	69.2
Abdominal pain	5.1	4.5	15.9	11.9
Back pain	3.8	2.8	15.0	19
Asthenia	2.5	2.8	6.8	5.7
Headache	3.6	3.3	5.8	6.2

Accidental injury	1.5	2.0	18.4	18.5
Flu syndrome	1.7	2.0	17.9	18.0
Chest pain	1.9	1.3	10.1	8.5
Malaise	1.5	0.2	2.4	0.5
Cardiovascular system	4.9	4.0	40.6	45.5
Digestive system	21.8	17.6	41.6	41.2
Diarrhea	2.9	4.8	7.3	5.7
Nausea	2.3	2.3	0.5	1.9
Constipation	2.3	1.5	5.3	3.8
Dyspepsia	2.7	2.5	3.9	5.7
Endocrine system	0.4	0	4.8	5.2
Haemic & lymphatic system	2.1	1.0	9.2	7.1
Metabolic & nutritional disorders	7.6	5.5	15.5	19.4
CPK increase	2.7	1.2	1.9	2.8
ALAT increase	3.4	1.5	3.9	1.4
ASAT increase	4.0	0.5	1.0	1.9
Musculo-skeletal system	4.9	5.3	40.6	39.8
Arthralgia	1.9	1.8	25.1	22.1
Myalgia	0.8	1.0	3.4	3.8
Nervous system	4.4	6.0	28.5	27.5
Dizziness	1.5	1.0	7.3	5.7
Insomnia	1.05	0.5	1.9	2.4
Respiratory system	12.9	12.1	52.2	49.8
Respiratory dis.	6.3	5.5	6.8	4.3
Sinusitis	1.9	2.5	7.7	7.6
Pharyngitis	2.9	2.5	7.8	7.6
Rhinitis	2.7	1.8	23.2	21.2
Bronchitis	1.3	1.3	16.4	14.7
Skin and appendages	7.0	2.5	28.0	22.8
Rash	1.5	0.75	7.3	4.3
Pruritus	2.1	0.5	3.4	2.8
Urticaria	1.3	0	0	0
Special senses	3.2	2.8	21.3	23.7
Conjunctivitis	1.05	1.0	1.9	4.3
Urogenital system	4.4	5.0	26.6	21.8

## **DOSAGE AND ADMINISTRATION**

### **Adults (Dyslipidaemia and Diabetic Retinopathy)**

Lipidil is presented as a 145 mg tablet and a 48 mg tablet. The usual dose of fenofibrate is 1 x 145 mg tablet. Although 3 x 48 mg tablets are equivalent to 1 x 145 mg tablet, the 48 mg tablets are only recommended when a decreased dosage is required (see 'Renal Impairment').

Patients should never be administered any combination of the 48 mg tablet and the 145 mg tablet of fenofibrate. There is no indication for use of fenofibrate dosages above 145 mg per day. Lipidil 145 mg and 48 mg tablets should be swallowed whole with a glass of water. Lipidil 145 mg and 48 mg may be given at any time of the day, with or without food, but it is recommended that they be taken at the same time each day. Dietary measures instituted before therapy should be continued.

## **Elderly**

In elderly patients without renal impairment, the normal adult dose is recommended.

## **Renal Impairment**

In renal dysfunction, the dosage may need to be reduced depending on the rate of creatinine clearance.

<b>Creatinine clearance (ml/min)</b>	<b>Dosage</b>
> 60	one 145 mg tablet
20 – 60*	Two 48 mg tablets
10 – 20*	One 48 mg tablet

\*Lipidil 48 mg should be used in this case

In patients with severe renal dysfunction (CrCl < 10mL/min), fenofibrate should not be used.

## **Hepatic disease**

Patients with hepatic disease have not been studied.

## **OVERDOSAGE**

There is no specific treatment for overdose with Lipidil. General supportive care of the patient is indicated, including monitoring of vital signs and observation of clinical status, should an overdose occur. Because fenofibrate is highly bound to plasma proteins, hemodialysis should not be considered. In case of overdose, contact the Poisons Information Centre on 13 11 26 for advice on management.

## **PRESENTATION AND STORAGE CONDITIONS**

48 mg tablets (AUST R 118642): Yellow, oblong, film-coated tablets engraved “48” on one side and “Fournier logo” on the reverse. Packs of 60 in blister strip (PVC/PE/PVDC/Aluminium).

145 mg tablets (AUST R 118634): White, oblong, film-coated tablets engraved “145” on one side and “Fournier logo” on the reverse. Packs of 30 and 10 tablets in blister strip (PVC/PE/PVDC/Aluminium).

Store below 30°C. Protect from moisture.

## **NAME AND ADDRESS OF THE SPONSOR**

Abbott Australasia Pty Ltd  
32-34 Lord Street  
Botany NSW 2019  
Australia

## **POISON SCHEDULE OF THE MEDICINE**

Schedule 4

## **DATE OF APPROVAL**

Date of TGA approval: 16 May 2006  
Date of last amendment: XX October 2013