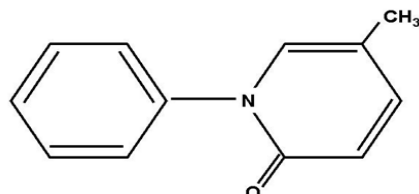




## NAME OF THE MEDICINE

### ESBRIET®

Pirfenidone



CAS: 53179-13-8

## DESCRIPTION

The chemical name of pirfenidone is 5-methyl-1-phenyl-2-1(H)-pyridone. It has a molecular formula of  $C_{12}H_{11}NO$  and a molecular weight of 185.23.

Pirfenidone is a white to pale yellow, non-hygroscopic powder. It is freely soluble in methanol, ethyl alcohol, acetone and chloroform. Sparingly soluble in 1.0 N HCl, water and 0.1N sodium hydroxide. The melting point is approximately 109°C.

ESBRIET is available as a white hard gelatin capsule for oral administration containing 267 mg of pirfenidone and the following inactive ingredients: microcrystalline cellulose, croscarmellose sodium, povidone, and magnesium stearate. In addition, the capsule shell contains gelatin and titanium dioxide. The capsule brown printing ink includes shellac, iron oxide black, iron oxide red, iron oxide yellow, propylene glycol, ammonium hydroxide.

## PHARMACOLOGY

### Pharmacodynamics

The mechanism of action of pirfenidone has not been fully established. Idiopathic pulmonary fibrosis (IPF) is a chronic fibrotic and inflammatory pulmonary disease affected by the synthesis and release of pro-inflammatory cytokines including tumour necrosis factor-alpha (TNF- $\alpha$ ) and interleukin-1-beta (IL-1 $\beta$ ). Existing data indicate that pirfenidone exerts both anti-fibrotic and anti-inflammatory properties in animal models of inflammation and pulmonary fibrosis.

Pirfenidone attenuated the release of pro-inflammatory and pro-fibrotic cytokines in response to inflammatory stimuli in mice at clinically relevant doses. In addition, pirfenidone was able to prevent the development of lung fibrosis when given prophylactically, and arrest further fibrosis development, in the bleomycin-induced model of lung fibrosis. Pirfenidone did not reverse established lung fibrosis in rats at clinically relevant doses.

## Pharmacokinetics

### *Absorption*

Administration of ESBRIET with food results in a large reduction in C<sub>max</sub> (by 50%) and a smaller effect on AUC, compared to the fasted state. Following oral administration of a single dose of 801 mg to healthy older adult volunteers (50–66 years of age) in the fed state, the rate of pirfenidone absorption slowed, while the AUC in the fed state was approximately 80–85% of the AUC observed in the fasted state. A reduced incidence of adverse events (nausea and dizziness) was observed in fed subjects when compared to the fasted group. Therefore, it is recommended that ESBRIET be administered with food to reduce the incidence of nausea and dizziness.

The bioavailability of pirfenidone has not been determined in humans.

### *Distribution*

Pirfenidone binds to human plasma proteins, primarily to serum albumin. The overall mean binding ranged from 50% to 62% in studies conducted *in vitro* (1 to 100 µg/mL) and *ex vivo*. Mean apparent oral steady-state volume of distribution is approximately 70 L, indicating that pirfenidone distribution to tissues is modest.

### *Metabolism*

*In vitro* metabolism studies with hepatic microsomes indicate that pirfenidone is metabolized primarily via CYP1A2 with lesser contribution from other CYP isoenzymes including CYP2C9, 2C19, 2D6 and 2E1 (see INTERACTIONS WITH OTHER MEDICINES). The major metabolite, 5-carboxy-pirfenidone, displays no or only very weak pharmacological activity.

### *Excretion*

The oral clearance of pirfenidone appears modestly saturable. In a multiple dose, dose ranging study in healthy older adults administered doses ranging from 267 mg to 1335 mg three times a day, the mean clearance decreased by approximately 25% above a dose of 801 mg three times a day. Following single dose administration of pirfenidone in healthy older adults, the mean apparent terminal elimination half-life was approximately 2.4 hours. Approximately 80% of an orally administered dose of pirfenidone is cleared in the urine within 24 hours of dosing. The majority of pirfenidone is excreted as the 5-carboxy-pirfenidone metabolite (>95% of that recovered), with less than 1% of pirfenidone excreted unchanged in urine.

### *Pharmacokinetics in Special Populations*

#### **Hepatic impairment**

The pharmacokinetics of pirfenidone and the 5-carboxy-pirfenidone metabolite were compared in subjects with moderate hepatic impairment (Child Pugh Class B) and in subjects with normal hepatic function. Results showed that there was a mean increase of 60% in pirfenidone exposure after a single dose of 801 mg pirfenidone (3 x 267 mg capsule) in patients with moderate hepatic impairment. Pirfenidone should be used with caution in patients with mild to moderate hepatic impairment and patients should be monitored closely for signs of toxicity especially if they are concomitantly taking a known CYP1A2 inhibitor (see PRECAUTIONS;

DOSAGE AND ADMINISTRATION). ESBRIET is contraindicated in severe hepatic impairment and end stage liver disease (see CONTRAINDICATIONS; PRECAUTIONS).

### **Renal impairment**

No clinically relevant differences in the pharmacokinetics of pirfenidone were observed in subjects with mild to severe renal impairment compared with subjects with normal renal function. The parent substance is predominantly metabolised to 5 carboxy-pirfenidone, and the pharmacokinetics of this metabolite is altered in subjects with moderate to severe renal impairment. However, the predicted amount of metabolite accumulation at steady state is not pharmacodynamically important because the terminal elimination half-life is only 1–2 hours in these subjects. No dose adjustment is required in patients with mild to moderate renal impairment who are receiving pirfenidone. The use of pirfenidone is contraindicated in patients with severe renal impairment (CrCl <30ml/min) or end stage renal disease requiring dialysis (see PRECAUTIONS; DOSAGE AND ADMINISTRATION).

Population pharmacokinetic analyses from 4 studies in healthy subjects or subjects with renal impairment and one study in patients with IPF showed no clinically relevant effect of age, gender or body size on the pharmacokinetics of pirfenidone.

### **CLINICAL TRIALS**

The clinical efficacy of ESBRIET has been studied in three multinational, Phase 3, multicenter, randomized, double-blind, placebo-controlled studies in patients with idiopathic pulmonary fibrosis (IPF): PIPF 004, PIPF 006 (CAPACITY) and PIPF-016 (ASCEND).

PIPF 004 and PIPF 006 compared treatment with ESBRIET 2403 mg/day to placebo. The studies were nearly identical in design, with few exceptions including an intermediate dose group (1197 mg/day) in PIPF 004. In both studies, treatment was administered three times daily for a minimum of 72 weeks. The primary endpoint in both studies was the change from baseline to Week 72 in percent predicted Forced Vital Capacity (FVC).

In study PIPF 004, the decline in percent predicted FVC from baseline at Week 72 of treatment was significantly reduced in patients receiving ESBRIET (N = 174) compared with patients receiving placebo (N = 174; p = 0.001, rank ANCOVA). Treatment with ESBRIET also significantly reduced the decline in percent predicted FVC from baseline at Weeks 24 (p = 0.014), 36 (p < 0.001), 48 (p < 0.001), and 60 (p < 0.001). At Week 72, a decline from baseline in percent predicted FVC of ≥10% (a threshold indicative of the risk of mortality in IPF) was seen in 20% of patients receiving ESBRIET compared to 35% receiving placebo (Table 1).

**Table 1: Categorical Assessment of Change from Baseline to Week 72 in Percent Predicted FVC in Study PIPF-004**

	<b>Pirfenidone 2403 mg/day (N = 174)</b>	<b>Placebo (N = 174)</b>
Decline of $\geq 10\%$ or death or lung transplant	35 (20%)	60 (35%)
Decline of less than 10%	97 (56%)	90 (52%)
No decline (FVC change $>0\%$ )	42 (24%)	24 (14%)

Although there was no difference between patients receiving ESBRIET compared to placebo in change from baseline to Week 72 of distance walked during a six minute walk test (6MWT) by the pre-specified rank ANCOVA, in an ad hoc analysis, 37% of patients receiving ESBRIET showed a decline of  $\geq 50$  m in 6MWT distance, compared to 47% of patients receiving placebo in PIPF-004.

In study PIPF 006, treatment with ESBRIET (N = 171) did not reduce the decline in percent predicted FVC from baseline at Week 72 compared with placebo (N = 173;  $p = 0.501$ ). However, treatment with ESBRIET reduced the decline in percent predicted FVC from baseline at Weeks 24 ( $p < 0.001$ ), 36 ( $p = 0.011$ ), and 48 ( $p = 0.005$ ). At Week 72, a decline in FVC of  $\geq 10\%$  was seen in 23% of patients receiving ESBRIET and 27% receiving placebo (Table 2).

**Table 2: Categorical Assessment of Change from Baseline to Week 72 in Percent Predicted FVC in Study PIPF-006**

	<b>Pirfenidone 2403 mg/day (N = 171)</b>	<b>Placebo (N = 173)</b>
Decline of $\geq 10\%$ or death or lung transplant	39 (23%)	46 (27%)
Decline of less than 10%	88 (52%)	89 (51%)
No decline (FVC change $>0\%$ )	44 (26%)	38 (22%)

The decline in 6MWT distance from baseline to Week 72 was significantly reduced compared with placebo ( $p < 0.001$ , rank ANCOVA). Additionally, in an ad hoc analysis, 33% of patients receiving ESBRIET showed a decline of  $\geq 50$  m in 6MWT distance, compared to 47% of patients receiving placebo.

In a pooled analysis of survival in PIPF 004 and PIPF 006 the mortality rate with ESBRIET 2403 mg/day group was 7.8% compared with 9.8% with placebo (HR 0.77 [95% CI, 0.47–1.28]).

PIPF-016 compared treatment with ESBRIET 2,403 mg/day to placebo. Treatment was administered three times daily for 52 weeks. The primary endpoint was the change from Baseline to Week 52 in percent predicted FVC. In a total of 555 patients, the median baseline

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percent predicted FVC and %DLCO were 68% (range: 48–91%) and 42% (range: 27–170%), respectively. Two percent of patients had percent predicted FVC below 50% and 21% of patients had a percent predicted DLCO below 35% at Baseline.

In study PIPF-016, the decline in percent predicted FVC from baseline at Week 52 of treatment was significantly reduced in patients receiving ESBRIET (N = 278) compared with patients receiving placebo (N = 277;  $p < 0.000001$ , rank ANCOVA). Treatment with ESBRIET also significantly reduced the decline in percent predicted FVC from baseline at Weeks 13 ( $p < 0.000001$ ), 26 ( $p < 0.000001$ ), and 39 ( $p = 0.000002$ ). At Week 52, a decline from baseline in percent predicted FVC of  $\geq 10\%$  or death was seen in 17% of patients receiving ESBRIET compared to 32% receiving placebo (Table 3).

**Table 3: Categorical Assessment of Change from Baseline to Week 52 in Percent Predicted FVC in Study PIPF-016**

	<b>Pirfenidone 2403 mg/day (N = 278)</b>	<b>Placebo (N = 277)</b>
Decline of $\geq 10\%$ or death	46 (17%)	88 (32%)
Decline of less than 10%	169 (61%)	162 (58%)
No decline (FVC change $> 0\%$ )	63 (23%)	27 (10%)

The decline in distance walked during a 6MWT from baseline to Week 52 was significantly reduced in patients receiving ESBRIET compared with patients receiving placebo in PIPF-016 ( $p = 0.036$ , rank ANCOVA); 26% of patients receiving ESBRIET showed a decline of  $\geq 50$  m in 6MWT distance compared to 36% of patients receiving placebo.

In a pre-specified pooled analysis of studies PIPF-016, PIPF-004, and PIPF-006 at Month 12, all-cause mortality was significantly lower in ESBRIET 2403 mg/day group (3.5%, 22 of 623 patients) compared with placebo (6.7%, 42 of 624 patients), resulting in a 48% reduction in the risk of all-cause mortality within the first 12 months (HR 0.52 [95% CI, 0.31–0.87],  $p = 0.0107$ , log-rank test).

## INDICATIONS

ESBRIET is indicated for the treatment of idiopathic pulmonary fibrosis (IPF)

## CONTRAINDICATIONS

- Hypersensitivity to the active substance or to any of the excipients
- Concomitant use of fluvoxamine (see INTERACTIONS WITH OTHER MEDICINES)
- History of angioedema with pirfenidone (see PRECAUTIONS).
- Severe hepatic impairment or end stage liver disease (see PHARMACOLOGY, Pharmacokinetics in Special Populations and PRECAUTIONS).

- Severe renal impairment (CrCl <30 ml/min) or end stage renal disease requiring dialysis (see PHARMACOLOGY, Pharmacokinetics in Special Populations and PRECAUTIONS).

## **PRECAUTIONS**

### **Hepatic Function**

Increases in ALT and AST  $>3 \times$  ULN have been reported in patients treated with ESBRIET. Rarely these have been associated with concomitant elevations in bilirubin. Patients treated with ESBRIET 2403 mg/day in the three Phase 3 trials had a higher incidence of elevations in ALT or AST  $\geq 3 \times$  ULN than placebo patients (3.7% vs. 0.8%, respectively). Elevations  $\geq 10 \times$  ULN in ALT or AST occurred in 0.3% of patients in the ESBRIET 2403 mg/day group and in 0.2% of patients in the placebo group. Increases in ALT and AST  $\geq 3 \times$  ULN were reversible with dose modification or treatment discontinuation. No cases of liver transplant or death due to liver failure that were related to ESBRIET have been reported. However, the combination of transaminase elevations and elevated bilirubin without evidence of obstruction is generally recognized as an important predictor of severe liver injury, that could lead to death or the need for liver transplants in some patients. Conduct liver function tests (ALT, AST, and bilirubin) prior to the initiation of therapy with ESBRIET in all patients, then monthly for the first 6 months and every 3 months thereafter. Dosage modifications or interruption may be necessary for liver enzyme elevations (see DOSAGE AND ADMINISTRATION).

### **Photosensitivity Reaction and Rash**

Exposure to direct sunlight (including sunlamps) should be avoided or minimized during treatment with ESBRIET. Patients should be instructed to use an effective sunblock daily, to wear clothing that protects against sun exposure, and to avoid other medicinal products known to cause photosensitivity. Patients should be instructed to report symptoms of photosensitivity reaction or rash to their physician. Dose adjustments or temporary treatment discontinuation may be necessary for photosensitivity reaction or rash (see DOSAGE AND ADMINISTRATION).

### **Cigarette Smoking and Inducers of CYP1A2**

A Phase 1 interaction study evaluated the effect of cigarette smoking (CYP1A2 inducer) on the pharmacokinetics of ESBRIET. The exposure to pirfenidone in smokers was 50% of that observed in non-smokers. Smoking has the potential to induce hepatic enzyme production and thus increase clearance and decrease exposure to ESBRIET. Concomitant use of strong inducers of CYP1A2 including smoking should be avoided during ESBRIET therapy based on the observed relationship between cigarette smoking and its potential to induce CYP1A2. Patients should be encouraged to discontinue use of strong inducers of CYP1A2 and to stop smoking before and during treatment with pirfenidone.

### **Effects on fertility**

Fertility indices were unaffected in male and female rats treated with pirfenidone at oral doses up to 1000 mg/kg/day. However, prolongation of the oestrous cycle and a high incidence of irregular cycles was observed in rats at doses  $\geq 450$  mg/kg/day (1.7-times the maximum recommended human dose based on body surface area).



### **Use in pregnancy – Category B3**

There are no data from the use of ESBRIET in pregnant women.

In animals, placental transfer of pirfenidone and/or its metabolites occurs with the potential for accumulation of pirfenidone and/or its metabolites in amniotic fluid. Pirfenidone was not teratogenic in rats or rabbits at oral doses up to 1000 mg/kg/day and 300 mg/kg/day in the respective species (approximately 4 and 2 times the maximum recommended human dose on a body surface area basis). In rats, treatment at  $\geq 450$  mg/kg/day was associated with delayed fetal ossification, and at 1000 mg/kg/day, prolongation of gestation and reduction in fetal viability were observed (the doses being approximately 2 to 4 times the MRHD). As a precautionary measure, it is preferable to avoid the use of ESBRIET during pregnancy.

### **Use in lactation**

It is unknown whether pirfenidone or its metabolites are excreted in human milk. Studies in lactating rats have shown excretion of pirfenidone and/or its metabolites in milk with the potential for accumulation of pirfenidone and/or its metabolites in milk. Postnatal body weight gain was reduced in the offspring of rats that received oral doses of pirfenidone at  $\geq 300$  mg/kg/day (approximately equal to the MRHD on a body surface area basis) during gestation and lactation. A risk to the breastfeeding child cannot be excluded.

A decision must be made whether to discontinue breast feeding or to discontinue from ESBRIET therapy, taking into account the benefit of breast feeding for the child and the benefit of ESBRIET therapy for the mother.

### **Paediatric use**

The safety and efficacy of ESBRIET in paediatric patients has not been established.

### **Use in the elderly**

No overall differences in safety or effectiveness were observed between older and younger patients. No dosage adjustment is required based upon age.

### **Genotoxicity**

Pirfenidone showed no indication of genotoxic activity in assays for bacterial mutagenicity, for chromosomal aberrations in vitro in mammalian cells, for clastogenicity in vivo in mice, and for DNA damage in rats. No significant mutagenic activity was observed with pirfenidone in bacteria when tested under UV exposure.

### **Carcinogenicity**

An increased incidence of liver tumours (hepatocellular adenomas and carcinomas, and hepatoblastomas) was observed in 2-year carcinogenicity studies conducted by the oral route in rats and mice. This occurred at doses  $\geq 750$  mg/kg/day and  $\geq 800$  mg/kg/day in the respective species, associated with systemic exposure (plasma AUC) less than that of patients at the maximum recommended human dose. These hepatic findings are consistent with an induction of hepatic microsomal enzymes, an effect which has not been observed in patients receiving ESBRIET. These findings are considered unlikely to be relevant to humans but this cannot be excluded.

A statistically significant increase in uterine tumours (adenocarcinoma) was observed in female rats administered 1500 mg/kg/day, yielding systemic exposure (plasma AUC) similar to that in patients at the maximum recommended human dose of 2403 mg/day. The relevance of this finding to humans is unclear.

### **Use in renal impairment**

ESBRIET should be used with caution in patients with mild, moderate, or severe renal impairment.

The safety, efficacy, and pharmacokinetics of ESBRIET have not been studied in patients with end-stage renal disease requiring dialysis. Use of ESBRIET in patients with end-stage renal diseases requiring dialysis is not recommended.

### **Use in hepatic impairment**

ESBRIET should be used with caution in patients with mild to moderate hepatic impairment (see PRECAUTIONS/ Hepatic Function).

The safety, efficacy, and pharmacokinetics of ESBRIET have not been studied in patients with severe hepatic impairment or end stage liver disease. ESBRIET is contraindicated in patients with severe hepatic impairment or end stage liver disease.

### **Angioedema**

Reports of angioedema (some serious) such as swelling of the face, lips and/or tongue which may be associated with difficulty breathing or wheezing have been received in association with use of ESBRIET in the post-marketing setting. Therefore, patients who develop signs or symptoms of angioedema following administration of ESBRIET should immediately discontinue treatment. Patients with angioedema should be managed according to standard of care. ESBRIET should not be used in patients with a history of angioedema due to ESBRIET (see CONTRAINDICATIONS).

### **Dizziness**

Dizziness has been reported in patients taking ESBRIET. Therefore, patients should know how they react to this medicinal product before they engage in activities requiring mental alertness or coordination (see PRECAUTIONS, Ability to Drive or Operate Machinery). In clinical studies, most patients who experienced dizziness had a single event, and most events resolved, with a median duration of 22 days. If dizziness does not improve or if it worsens in severity, dose adjustment or even discontinuation of ESBRIET may be warranted.

### **Fatigue**

Fatigue has been reported in patients taking ESBRIET. Therefore, patients should know how they react to this medicinal product before they engage in activities requiring mental alertness or coordination (see PRECAUTIONS, Ability to Drive or Operate Machinery).

### **Weight Loss**

Weight loss has been reported in patients treated with ESBRIET (see ADVERSE EFFECTS). Physicians should monitor patients' weight, and when appropriate encourage increased caloric intake if weight loss is considered to be of clinical significance.



### **Ability to Drive or Operate Machinery**

No studies on the effects of the ability to drive and use machines have been performed. ESBRIET may cause dizziness and fatigue, which could influence the ability to drive or use machines.

### **INTERACTIONS WITH OTHER MEDICINES**

Pirfenidone is metabolized primarily via CYP1A2 with minor contributions from other CYP isoenzymes including CYP2C9, 2C19, 2D6 and 2E1.

#### ***Fluvoxamine and Inhibitors of CYP1A2***

In a Phase 1 study, the co-administration of ESBRIET and fluvoxamine (a strong inhibitor of CYP1A2 with inhibitory effects on other CYP isoenzymes [CYP2C9, 2C19, and 2D6]) resulted in a 4 fold increase in exposure to pirfenidone in non-smokers.

ESBRIET is contraindicated in patients with concomitant use of fluvoxamine (see CONTRAINDICATIONS). Fluvoxamine should be discontinued prior to the initiation of ESBRIET therapy and avoided during ESBRIET therapy due to the reduced clearance of pirfenidone.

In vitro-in vivo extrapolations indicate that strong and selective inhibitors of CYP1A2 have the potential to increase the exposure to pirfenidone by approximately 2 to 4 fold. If concomitant use of ESBRIET with a strong and selective inhibitor of CYP1A2 cannot be avoided, the dose of ESBRIET should be reduced to 801 mg daily (one capsule, three times a day). Patients should be closely monitored for emergence of adverse reactions associated with ESBRIET therapy. Discontinue ESBRIET if necessary (see DOSAGE AND ADMINISTRATION)

Co-administration of ESBRIET and 750 mg of ciprofloxacin (a moderate and selective inhibitor of CYP1A2) increased the exposure to pirfenidone by 81%. If ciprofloxacin at the dose of 750 mg twice daily cannot be avoided, the dose of ESBRIET should be reduced to 1602 mg daily (two capsules, three times a day). ESBRIET should be used with caution when ciprofloxacin is used at a dose of 250 mg or 500 mg once or twice daily.

ESBRIET should be used with caution in patients treated with other moderate inhibitors of CYP1A2.

Agents or combinations of agents that are moderate or strong inhibitors of both CYP1A2 and one or more other CYP isoenzymes involved in the metabolism of pirfenidone (i.e., CYP2C9, 2C19, 2D6, and 2E1) should be avoided during ESBRIET treatment.

#### ***Inducers of CYP1A2***

In the case of moderate inducers of CYP1A2 (e.g., omeprazole), concomitant use may theoretically result in a lowering of pirfenidone plasma levels.

Co-administration of medicinal products that act as potent inducers of both CYP1A2 and the other CYP isoenzymes involved in the metabolism of pirfenidone (e.g., rifampicin) may result in significant lowering of pirfenidone plasma levels. These medicinal products should be avoided whenever possible.

### ***Effects of pirfenidone on transporters***

Pirfenidone is not a substrate for P-glycoprotein. In vitro, pirfenidone inhibited P-glycoprotein-mediated transport by approximately 30% at 1 mM, the highest concentration tested. The predicted intestinal concentration of pirfenidone at the MRHD is 1.7 mM. Therefore, pirfenidone may inhibit intestinal P-glycoprotein during clinical use. The effects of pirfenidone on other transport proteins have not been investigated.

## **ADVERSE EFFECTS**

### ***Clinical Trials***

The safety of ESBRIET has been evaluated in clinical studies including 1650 volunteers and patients.

More than 170 patients have been investigated in open studies for more than five years and some for up to 10 years.

The most commonly reported adverse reactions during clinical study experience with ESBRIET at a dose of 2403 mg/day compared to placebo, respectively, were nausea (32.4% versus 12.2%), rash (26.2% versus 7.7%), diarrhoea (18.8% versus 14.4%), fatigue (18.5% versus 10.4%), dyspepsia (16.1% versus 5.0%), anorexia (11.4% versus 3.5%), headache (10.1% versus 7.7%), and photosensitivity reaction (9.3% versus 1.1%).

Serious adverse reactions were recorded at similar frequencies among patients treated with 2403 mg/day of ESBRIET and placebo in clinical studies.

The most common adverse reactions with an incidence of  $\geq 10\%$  and more frequent in the ESBRIET than placebo treatment group are listed in Table 4.

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**Table 4 Adverse reactions occurring in  $\geq 10\%$  of ESBRIET-treated patients and more commonly than placebo in pivotal Studies**

Adverse Reaction	% of Patients (0 to 118 Weeks)	
	ESBRIET 2403 mg/day (N = 623)	Placebo (N = 624)
Nausea	36%	16%
Rash	30%	10%
Abdominal Pain <sup>1</sup>	24%	15%
Upper Respiratory Tract Infection	27%	25%
Diarrhea	26%	20%
Fatigue	26%	19%
Headache	22%	19%
Dyspepsia	19%	7%
Dizziness	18%	11%
Vomiting	13%	6%
Anorexia	13%	5%
Gastro-esophageal Reflux Disease	11%	7%
Sinusitis	11%	10%
Insomnia	10%	7%
Weight Decreased	10%	5%
Arthralgia	10%	7%

<sup>1</sup> Includes abdominal pain, upper abdominal pain, abdominal distension, and stomach discomfort.

### ***Post marketing experience***

In addition to adverse reactions identified from clinical trials the following adverse reactions have been identified during post approval use of pirfenidone. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency.

*Blood and Lymphatic System Disorders:* Agranulocytosis

*Immune System Disorders:* Angioedema

*Hepatobiliary Disorders:* Bilirubin increased in combination with increases of ALT and AST

### **DOSAGE AND ADMINISTRATION**

Treatment with ESBRIET should be initiated by physicians experienced in the diagnosis and treatment of IPF.

## **Adults**

Upon initiating treatment, the dose should be titrated to the recommended daily dose of nine capsules per day over a 14 day period as follows:

- Days 1 to 7: one capsule, three times a day (801 mg/day)
- Days 8 to 14: two capsules, three times a day (1602 mg/day)
- Day 15 onward: three capsules, three times a day (2403 mg/day)

The recommended daily dose of ESBRIET for patients with IPF is three 267 mg capsules three times a day with food for a total of 2403 mg/day.

Doses above 2403 mg/day are not recommended for any patient.

Patients who miss 14 consecutive days or more of ESBRIET treatment should re-initiate therapy by undergoing the initial 2 week titration regimen up to the recommended daily dose.

For treatment interruption of less than 14 consecutive days, the dose can be resumed at the previous recommended daily dose without titration.

### Dose Adjustments and Other Considerations

*Gastrointestinal events:* In patients who experience intolerance to therapy due to gastrointestinal side effects, patients should be reminded to take the medicinal product with food. If symptoms persist ESBRIET may be reduced to 1–2 capsules (267 mg – 534 mg) 2–3 times/day with food with re-escalation to the recommended daily dose as tolerated. If symptoms continue, patients may be instructed to interrupt treatment for 1 to 2 weeks to allow symptoms to resolve.

*Photosensitivity reaction or rash:* Patients who experience a mild to moderate photosensitivity reaction or rash should be reminded of the instruction to use a sunblock daily and to avoid sun exposure (see PRECAUTIONS). The dose of ESBRIET may be reduced to 3 capsules/day (1 capsule three times daily). If the rash persists after 7 days, ESBRIET should be discontinued for 15 days, with re escalation to the recommended daily dose in the same manner as the dose escalation period.

Patients who experience severe photosensitivity reaction or rash should be instructed to interrupt the dose and to seek medical advice (see PRECAUTIONS). Once the rash has resolved, ESBRIET may be reintroduced and re-escalated up to the recommended daily dose at the discretion of the physician.

*Hepatic function:* In the event of significant elevation of alanine and /or aspartate aminotransferases (ALT/AST) with or without bilirubin elevation, the dose of ESBRIET should be adjusted or treatment discontinued (see DOSAGE AND ADMINISTRATION/Recommendations in case of elevations in ALT, AST and serum bilirubin) .

*Recommendations in case of elevations in ALT, AST and serum bilirubin:* If a patient exhibits an aminotransferase elevation  $>3$  to  $\leq 5 \times$  ULN after starting ESBRIET therapy, confounding

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medicinal products should be discontinued, other causes excluded, and the patient monitored closely. If clinically appropriate the dose of ESBRIET should be reduced or interrupted. Once liver function tests are within normal limits ESBRIET may be re-escalated to the recommended daily dose if tolerated.

If a patient exhibits an aminotransferase elevation to  $\leq 5 \times$  ULN accompanied by symptoms or hyperbilirubinemia, ESBRIET should be discontinued and the patient should not be rechallenged.

If a patient exhibits an aminotransferase elevation to  $>5 \times$  ULN, ESBRIET should be discontinued and the patient should not be rechallenged.

## **Special Populations**

### ***Elderly***

No dose adjustment is necessary in patients 65 years and older (see PRECAUTIONS/Use in elderly).

### ***Hepatic impairment***

No dose adjustment is necessary in patients with mild to moderate hepatic impairment (i.e., Child-Pugh Class A and B). However, since plasma levels of pirfenidone may be increased in some individuals with mild to moderate hepatic impairment, caution should be used with ESBRIET treatment in this population. Patients should be monitored closely for signs of toxicity especially if concomitantly taking a known CYP1A2 inhibitor (see PRECAUTIONS and INTERACTIONS WITH OTHER MEDICINES). ESBRIET has not been studied in patients with severe hepatic impairment or end stage liver disease, and it should not be used in patients with these conditions (see PRECAUTIONS). It is recommended to monitor liver function during treatment, and dose adjustments may be necessary in the event of elevations (see PRECAUTIONS and DOSAGE AND ADMINISTRATION/Recommendations in case of elevations in ALT, AST and serum bilirubin).

### ***Renal impairment***

No dose adjustment is necessary in patients with mild to moderate renal impairment. ESBRIET therapy should not be used in patients with severe renal impairment ( $\text{CrCl} < 30 \text{ mL/min}$ ) or end-stage renal disease requiring dialysis (see PRECAUTIONS).

## **OVERDOSAGE**

There is limited clinical experience with overdose. Multiple dosages of ESBRIET up to a dose of 4806 mg/day were administered as six 267 mg capsules three times daily to healthy adult volunteers over a 12-day dose escalation period. Adverse reactions were mild, transient and consistent with most frequently reported adverse reactions for pirfenidone.

In the event of a suspected overdose, supportive medical care should be provided including monitoring of vital signs and close observation of the clinical status of the patient.

For information on the management of overdose, contact the Poison Information Centre on 131126 (Australia).

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## **PRESENTATION AND STORAGE CONDITIONS**

ESBRIET 267 mg hard capsules are available in high-density polyethylene (HDPE) bottles of 270 capsules.

ESBRIET 267 mg are hard gelatin capsules with a white opaque body and a white opaque cap printed with "PFD" and "267 mg" in brown ink.

Store below 30°C.

## **DISPOSAL OF MEDICINES**

The release of medicines into the environment should be minimised. Medicines should not be disposed of via wastewater and disposal through household waste should be avoided. Unused or expired medicine should be returned to a pharmacy for disposal.

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

Roche Products Pty Limited

ABN 70 000 132 865

4-10 Inman Road, Dee Why NSW 2099

AUSTRALIA

Medical enquiries: 1800 233 950

Roche Products (New Zealand) Limited

PO Box 109113 Newmarket

Auckland 1149

NEW ZEALAND

Medical enquiries: 0800 656 464

## **POISON SCHEDULE OF THE MEDICINE**

Schedule 4 – Prescription Only Medicine

## **DATE OF FIRST INCLUSION IN THE AUSTRALIAN REGISTER OF THERAPEUTIC GOODS (THE ARTG)**

29 February 2016