

**SCHEDULING STATUS:** **S4**

## 1. NAME OF THE MEDICINE

DIFLUCAN® CAPSULES 50 mg

DIFLUCAN® CAPSULES 150 mg

DIFLUCAN® CAPSULES 200 mg

DIFLUCAN® IV INFUSION 100 mL

DIFLUCAN® 50 mg/5 mL Powder for oral suspension

DIFLUCAN® 200 mg/5 mL Powder for oral suspension

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each DIFLUCAN capsule 50 mg contains 50 mg fluconazole.

Each DIFLUCAN capsule 150 mg contains 150 mg fluconazole.

Each DIFLUCAN capsule 200 mg contains 200 mg fluconazole.

Contains sugar (lactose monohydrate).

Each DIFLUCAN IV infusion 100 mL contains 200 mg fluconazole (2 mg/mL). DIFLUCAN IV infusion is a sterile aqueous solution which is made iso-osmotic with sodium chloride.

Sugar free.

DIFLUCAN 50 mg/5 mL powder for oral suspension yields on reconstitution with 24 mL water as a suspension containing the equivalent of 50 mg fluconazole per 5 mL.

DIFLUCAN 200 mg/5 mL powder for oral suspension yields on reconstitution with 24 mL water as a suspension containing the equivalent of 200 mg fluconazole per 5 mL.

Contains sugar (sucrose).

*Excipients with known effect*

#### *DIFLUCAN capsules*

Each DIFLUCAN 50 mg capsule contains 49,708 mg lactose monohydrate.

Each DIFLUCAN 150 mg capsule contains 149,123 mg lactose monohydrate.

Each DIFLUCAN 200 mg capsule contains 198,830 mg lactose monohydrate.

#### *DIFLUCAN powder for oral suspension*

Each 5 mL DIFLUCAN 50 mg/5 mL powder for oral suspension contains 2,88 g sucrose and 0,24 % m/v sodium benzoate as preservative.

Each 5 mL DIFLUCAN 200 mg/5 mL powder for oral suspension contains 2,73 g sucrose and 0,24 % m/v sodium benzoate as preservative.

For the full list of excipients, see section 6.1.

### **3. PHARMACEUTICAL FORM**

#### *Hard capsules*

DIFLUCAN capsules 50 mg: Hard gelatin capsules with a white opaque body and a turquoise blue cap imprinted with the Pfizer logo and the code FLU-50.

DIFLUCAN capsules 150 mg: Hard gelatin capsules with a turquoise blue body and cap, imprinted with the Pfizer logo and the code FLU-150.

DIFLUCAN capsules 200 mg: Hard gelatin capsules with a white opaque body and a purple opaque cap imprinted with the Pfizer logo and the code FLU-200.

#### *Solution for infusion*

DIFLUCAN IV infusion 100 mL: Clear glass vials containing a clear, colourless solution.

#### *Powder for oral suspension*

DIFLUCAN 50 mg/5 mL and 200 mg/5 mL is a dry powder which yields on reconstitution with water an off-white, orange flavoured suspension. The colour of the powder is white to off-white.

## **4. CLINICAL PARTICULARS**

### **4.1 Therapeutic indications**

Once the results of cultures and other laboratory studies become available, anti-infective therapy should be adjusted accordingly.

DIFLUCAN is indicated for the treatment of the following conditions in adults and children:

- Cryptococcal meningitis in mentally alert patients without localising neurological signs and as a follow up therapy after amphotericin B therapy
- Maintenance therapy to prevent relapse of cryptococcal disease in patients with acquired immunodeficiency syndrome (AIDs)
- Systemic candidiasis
- Oropharyngeal and oesophageal candidiasis
- Prevention of fungal infections in patients with malignancy who are predisposed to such infections as a result of cytotoxic chemotherapy and radiotherapy

When systemic treatment is indicated and appropriate, DIFLUCAN 150 mg capsules is used in adults for the following conditions:

- Vaginal candidiasis, acute or recurrent and prophylaxis to reduce the incidence of recurrent vaginal candidiasis
- Candidial balanitis
- Dermatomycosis including tinea pedis, tinea corporis, tinea cruris, tinea unguium (onychomycosis), and dermal *Candida* infections

### **4.2 Posology and method of administration**

#### **Posology**

The daily dose of DIFLUCAN should be based on the nature and severity of the fungal infection.

Therapy for those types of infections requiring multiple dose treatment should be continued until clinical parameters or laboratory tests indicate that active fungal infection has subsided. An inadequate period of treatment may lead to recurrence of active infection.

Patients with AIDS and cryptococcal meningitis or recurrent oropharyngeal candidiasis usually require maintenance therapy to prevent relapse.

#### *Use in adults*

1. For cryptococcal meningitis the usual dose is 400 mg on the first day followed by 200 mg once daily. Depending on the clinical response of the patient this dose may be increased to 400 mg daily. Usually, duration of treatment for cryptococcal meningitis is 6 to 8 weeks.

For the prevention of relapse of cryptococcal meningitis in patients with AIDS, after the patient receives a full course of primary therapy, DIFLUCAN may be administered at a daily dose of 100 mg to 200 mg until the CD4 count has stabilised at more than 250 cells/mm<sup>3</sup>.

2. For systemic candidiasis, the usual dose is 400 mg on the first day followed by 200 mg daily. Depending on the clinical response, the dose may be increased to 400 mg daily. Duration of treatment is based upon the clinical response.
3. For oropharyngeal candidiasis, the usual dose is 50 mg to 100 mg once daily for 7 to 14 days. If necessary, treatment can be continued for longer periods in patients with severely compromised immune function.

For the prevention of relapse of oropharyngeal candidiasis in patients with AIDS, after the patient receives a full course of primary therapy, DIFLUCAN may be administered at a 150 mg once weekly dose.

For oesophageal candidiasis, the recommended dose is 200 mg on the first day, followed by 100 mg to

200 mg once daily. Doses up to 400 mg/day may be used, based on medical judgment of the patient's response to therapy. Patients with oesophageal candidiasis should be treated for a minimum of 3 weeks and for at least 2 weeks following resolution of symptoms.

4. The recommended DIFLUCAN dosage for the prevention of candidiasis is 50 mg to 400 mg once daily, based on the patient's risk for developing fungal infection. For patients at high risk of systemic infection e.g. patients who are anticipated to have profound or prolonged neutropenia, a dose of 400 mg once daily has been used. DIFLUCAN administration should start several days before the anticipated onset of neutropenia and continue for 7 days after the neutrophil count rises above 1 000 cells per mm<sup>3</sup>.

#### *DIFLUCAN 150 mg capsules*

For vaginal candidiasis DIFLUCAN 150 mg should be administered as a single oral dose.

To reduce the incidence of recurrent vaginal candidiasis, a 150 mg once monthly dose may be used. The duration of therapy should be individualised but ranges from 4 to 12 months. Some patients may require more frequent dosing.

For *Candida balanitis*, DIFLUCAN 150 mg should be administered as a single oral dose.

For dermal infections including tinea pedis, corporis, cruris and *Candida* infections the recommended dosage is 150 mg once weekly. Duration of treatment is normally 2 to 4 weeks but tinea pedis may require treatment for up to 6 weeks.

For tinea unguium, the recommended dosage is 150 mg once weekly. Treatment should be continued until infected nail is replaced (uninfected nail grows in). Regrowth of fingernails and toenails normally require 3 to 6 months and 6 to 12 months, respectively. However, growth rates may vary widely in individuals and by age. After successful treatment of long-term chronic infections, nails occasionally remain disfigured.

### Special populations

#### *Use in elderly patients*

Where there is no evidence of renal impairment, normal dosage recommendations should be adopted. For patients with renal impairment (creatinine clearance < 50 mL/min) the dosage schedule should be adjusted as described below.

#### *Use in patients with impaired renal function*

DIFLUCAN is cleared primarily by renal excretion as unchanged medicine. No adjustments in single dose therapy are necessary. Multiple-dose therapy should be carefully monitored in patients with renal impairment.

In patients (including children) with impaired renal function, an initial dose of 50 mg to 400 mg should be given. After the loading dose, the daily dose (according to indication) should be based on the following table:

Creatinine clearance (mL/min)	DIFLUCAN
	Percent of recommended dose
> 50	100 %
≤ 50 (no dialysis)	50 %
Haemodialysis	100 % after each haemodialysis

Patients on haemodialysis should receive 100 % of the recommended dose after each haemodialysis; on non-dialysis days, patients should receive a reduced dose according to their creatinine clearance.

These are suggested dose adjustments based on pharmacokinetics following administration of multiple doses. Further adjustment may be needed depending upon clinical condition. When serum creatinine is the only measure of renal function available, the following formula (based on sex, weight, and age of the patient) should be used to estimate the creatinine clearance:

Males:

$$\frac{[140 - \text{age}] \times \text{Wt (kg)} \times \text{constant}}{S_{\text{cr}} \text{ (mmol/L)}}$$

$S_{\text{cr}}$  (mmol/L)

Constant = 1,23 for males

Females:

$$\frac{[140 - \text{age}] \times \text{Wt (kg)} \times \text{constant}}{S_{\text{cr}} \text{ (mmol/L)}}$$

$S_{\text{cr}}$  (mmol/L)

Constant = 1,04 for females (0,85 x 1,23 = 1,04)

$S_{\text{cr}}$  = serum creatinine

### Paediatric population

As with similar infections in adults, the duration of treatment is based on the clinical and mycological response. The maximum adult daily dosage should not be exceeded in children. DIFLUCAN is administered as a single daily dose.

1. The recommended dosage of DIFLUCAN for oropharyngeal candidiasis in children is 6 mg/kg on the first day, followed by 3 mg/kg once daily.

Treatment should be administered for at least 2 weeks to decrease the likelihood of relapse.

2. For the treatment of oesophageal candidiasis, the recommended dosage of DIFLUCAN in children is 6 mg/kg on the first day, followed by 3 mg/kg once daily. Doses up to 12 mg/kg/day may be used based on medical judgment of the patient's response to therapy. Patients with oesophageal candidiasis should be treated for a minimum of 3 weeks and for at least 2 weeks following the resolution of symptoms.
3. For the treatment of systemic candidiasis and cryptococcal infection, the recommended dosage is 6

mg/kg/day – 12 mg/kg/day, depending on the severity of the disease.

4. For the prevention of fungal infections in immunocompromised patients considered at risk as a consequence of neutropenia following cytotoxic chemotherapy or radiotherapy, the dose should be 3 mg/kg/day – 12 mg/kg daily, depending on the extent and duration of the induced neutropenia.

For children with impaired renal function the daily dose should be reduced in accordance with the guidelines given for adults, dependent on the degree of renal impairment.

#### *Use in children 4 weeks of age and younger*

Neonates excrete DIFLUCAN slowly. In the first 2 weeks of life the same mg/kg dosing as in older children should be used but administered every 72 hours. During weeks 3 and 4 of life the same dose should be given every 48 hours.

#### **Method of administration**

##### *DIFLUCAN capsules*

For oral use.

##### *DIFLUCAN IV infusion*

For intravenous infusion.

DIFLUCAN may be infused at a maximum rate of approximately 200 mg/hour through an existing line with one of the fluids listed in section 6.6.

DIFLUCAN IV infusion is formulated in 0,9 % sodium chloride solution, each 200 mg (100 mL bottle) containing 15 mmol each of Na<sup>+</sup> and Cl<sup>-</sup>. Because DIFLUCAN IV infusion is available as a dilute saline solution, in patients requiring sodium or fluid restriction, consideration should be given to the rate of fluid administration.



For instructions on dilution of DIFLUCAN IV infusion, see section 6.6.

#### *DIFLUCAN powder for oral suspension*

For oral use.

For instructions on reconstitution of DIFLUCAN powder for oral suspension, see section 6.6.

### **4.3 Contraindications**

- DIFLUCAN should not be used in patients with known hypersensitivity to fluconazole or to related azole medicines or any of the excipients of DIFLUCAN (listed in section 6.1).
- Co-administration of terfenadine is contraindicated in patients receiving DIFLUCAN at multiple doses of 400 mg per day or higher based upon results of a multiple dose interaction study. Co-administration of other medicines known to prolong the QT interval and which are metabolised via the cytochrome P450 (CYP) 3A4 such as cisapride, astemizole, erythromycin, pimozide and quinidine are contraindicated in patients receiving DIFLUCAN (see sections 4.4 and 4.5).
- Pregnancy and lactation.

### **4.4 Special warnings and precautions for use**

#### *Hepatobiliary system*

DIFLUCAN should be administered with caution to patients with liver dysfunction.

DIFLUCAN has been associated with cases of serious hepatic toxicity including fatalities, primarily in patients with serious underlying medical conditions. In cases of DIFLUCAN-associated hepatotoxicity, no obvious relationship to total daily dose, duration of therapy, sex or age of patient has been observed. Hepatotoxicity may be reversible on discontinuation of therapy.

Patients who develop abnormal liver function tests during DIFLUCAN therapy should be monitored for the development of more serious hepatic injury. DIFLUCAN should be discontinued if clinical signs or

symptoms consistent with liver disease develop that may be attributable to DIFLUCAN.

#### *Dermatological reactions*

Patients have less frequently developed pruritus, rashes, urticaria, angioedema, dry skin, abnormal odour, exfoliative cutaneous reactions, such as Stevens-Johnson syndrome and toxic epidermal necrolysis during treatment with DIFLUCAN. Drug reaction with eosinophilia and systemic symptoms (DRESS) has been reported. AIDS patients are more prone to the development of severe cutaneous reactions to many medicines. If a rash, which is considered attributable to DIFLUCAN, develops in a patient treated for a superficial fungal infection, further therapy with DIFLUCAN should be discontinued. If patients with invasive/systemic fungal infections develop rashes, they should be monitored closely and DIFLUCAN discontinued if bullous lesions or erythema multiforme develop.

#### *Hypersensitivity*

Anaphylaxis has been reported with the use of DIFLUCAN.

#### *Cardiovascular system*

DIFLUCAN has been associated with prolongation of the QT interval on the electrocardiogram. DIFLUCAN causes QT prolongation via the inhibition of Rectifier Potassium Channel current ( $I_{kr}$ ). The QT prolongation caused by other medicines (such as amiodarone) may be amplified via the inhibition of cytochrome P450 (CYP) 3A4. During post-marketing surveillance, there have been cases of QT prolongation and *torsades de pointes* in patients taking DIFLUCAN. These reports included seriously ill patients with multiple confounding risk factors, such as structural heart disease, electrolyte abnormalities and concomitant medicines that may have been contributory. Patients with hypokalaemia and advanced cardiac failure are at an increased risk for the occurrence of life-threatening ventricular dysrhythmias and *torsades de pointes*.

DIFLUCAN should be administered with caution to patients with these potentially pro-dysrhythmic conditions.

#### *Halofantrine*

Halofantrine has been shown to prolong QTc interval at the recommended therapeutic dose and is a substrate of CYP3A4. The concomitant use of DIFLUCAN and halofantrine is therefore not recommended (see section 4.5).

#### *Renal system*

DIFLUCAN should be administered with caution to patients with renal dysfunction (see section 4.2).

#### *Adrenal insufficiency*

DIFLUCAN may cause adrenal insufficiency relating to concomitant treatment with prednisone (see section 4.5, *The effect of DIFLUCAN on other medicines*).

#### *Cytochrome P450*

DIFLUCAN is a moderate CYP2C9 and CYP3A4 inhibitor. DIFLUCAN is also a strong inhibitor of CYP2C19. DIFLUCAN-treated patients who are concomitantly treated with medicines with a narrow therapeutic window metabolised through CYP2C9, CYP2C19 and CYP3A4 should be monitored (see section 4.5).

#### *Terfenadine*

The co-administration of DIFLUCAN at doses lower than 400 mg per day with terfenadine should be carefully monitored (see sections 4.3 and 4.5).

#### *Candidiasis*

Studies have shown an increasing prevalence of infections with *Candida* species other than *C. albicans*. These are often inherently resistant (e.g. *C. krusei* and *C. auris*) or show reduced susceptibility to DIFLUCAN (*C. glabrata*). Such infections may require alternative antifungal therapy secondary to treatment failure. Therefore, health care providers are advised to take into account the prevalence of resistance in various *Candida* species to DIFLUCAN.

### *Excipients*

#### *DIFLUCAN capsules*

DIFLUCAN capsules contain lactose monohydrate. Patients with rare hereditary problems of galactose intolerance, total lactase deficiency or glucose-galactose malabsorption should not take this medicine.

#### *DIFLUCAN IV infusion*

DIFLUCAN IV infusion contains 15 mmol sodium per 100 mL dose. This should be taken into consideration by patients on a controlled sodium diet.

#### *DIFLUCAN powder for oral suspension*

DIFLUCAN powder for oral suspension contains sucrose. Patients with rare hereditary problems of fructose intolerance, glucose-galactose malabsorption or sucrase-isomaltase insufficiency should not take this medicine.

## **4.5 Interaction with other medicines and other forms of interaction**

*Concomitant use of the following other medicines is contraindicated:*

### *Cisapride*

There have been reports of cardiac events including *torsades de pointes* in patients to whom DIFLUCAN and cisapride were co-administered. A controlled study found that concomitant DIFLUCAN 200 mg once daily and cisapride 20 mg four times a day yielded a significant increase in cisapride plasma levels and prolongation of QTc interval. Concomitant treatment with DIFLUCAN and cisapride is contraindicated in patients receiving DIFLUCAN (see section 4.3).

### *Terfenadine*

Because of the occurrence of serious cardiac dysrhythmias secondary to prolongation of the QTc interval in patients receiving azole antifungals in conjunction with terfenadine, interaction studies have been performed. One study at a 200 mg daily dose of DIFLUCAN failed to demonstrate a prolongation in QTc interval. Another

study at a 400 mg and 800 mg daily dose of DIFLUCAN demonstrated that DIFLUCAN taken in doses of 400 mg per day or greater significantly increases plasma levels of terfenadine when taken concomitantly. The combined use of DIFLUCAN at doses of 400 mg or greater with terfenadine is contraindicated. The coadministration of DIFLUCAN at doses lower than 400 mg per day with terfenadine should be carefully monitored (see section 4.3).

#### *Astemizole*

Concomitant administration of DIFLUCAN with astemizole may decrease the clearance of astemizole. Resulting increased plasma concentrations of astemizole can lead to QT prolongation and *torsades de pointes*. Co-administration of DIFLUCAN and astemizole is contraindicated (see section 4.3).

#### *Pimozide*

Although not studied *in vitro* or *in vivo*, concomitant administration of DIFLUCAN with pimozide may result in inhibition of pimozide metabolism. Increased pimozide plasma concentrations can lead to QT prolongation and *torsades de pointes*. Co-administration of DIFLUCAN and pimozide is contraindicated (see section 4.3).

#### *Quinidine*

Although not studied *in vitro* or *in vivo*, concomitant administration of DIFLUCAN with quinidine may result in inhibition of quinidine metabolism. Use of quinidine has been associated with QT prolongation and *torsades de pointes*. Co-administration of DIFLUCAN and quinidine is contraindicated (see section 4.3).

#### *Erythromycin*

Concomitant use of DIFLUCAN and erythromycin has the potential to increase the risk of cardiotoxicity (prolonged QT interval, *torsades de pointes*) and consequently sudden death. Co-administration of DIFLUCAN and erythromycin is contraindicated (see section 4.3).

*Concomitant use of the following other medicines cannot be recommended:*

#### *Halofantrine*

DIFLUCAN can increase halofantrine plasma concentration due to an inhibitory effect on CYP3A4. Concomitant use of DIFLUCAN and halofantrine has the potential to increase the risk of cardiotoxicity (prolonged QT interval, *torsades de pointes*) and consequently sudden heart death. This combination should be avoided (see section 4.4).

*Concomitant use that should be used with caution:*

*Amiodarone*

Concomitant administration of DIFLUCAN with amiodarone may increase QT prolongation. Caution must be exercised if the concomitant use of DIFLUCAN and amiodarone is necessary, notably with high dose DIFLUCAN (800 mg) (see section 4.4).

*Concomitant use of the following medicines leads to precautions and dose adjustments:*

*The effect of other medicines on DIFLUCAN*

*Hydrochlorothiazide*

In a pharmacokinetic interaction study, co-administration of multiple-dose hydrochlorothiazide to healthy volunteers receiving DIFLUCAN increased plasma concentrations of DIFLUCAN by 40 %. An effect of this magnitude may necessitate a change in the DIFLUCAN dose regimen in subjects receiving concomitant diuretics.

*Rifampicin*

Concomitant administration of DIFLUCAN and rifampicin resulted in a 25 % decrease in the AUC and a 20 % shorter half-life of DIFLUCAN. In patients receiving concomitant rifampicin, an increase of the DIFLUCAN dose should be considered.

Interaction studies have shown that when oral DIFLUCAN is co-administered with food, cimetidine, antacids or following total body irradiation for bone marrow transplantation, no clinically significant impairment of absorption occurs.

*The effect of DIFLUCAN on other medicines*

DIFLUCAN is a moderate inhibitor of cytochrome P450 (CYP) isoenzyme 2C9 and 3A4. DIFLUCAN is also a strong inhibitor of the isoenzyme CYP2C19. In addition to the observed/documentated interactions mentioned below, there is a risk of increased plasma concentration of other medicines metabolised by CYP2C9, CYP2C19 and CYP3A4 co-administered with DIFLUCAN. Therefore, caution should be exercised when using these combinations and the patients should be carefully monitored. The enzyme inhibiting effect of DIFLUCAN persists for 4 – 5 days after discontinuation of DIFLUCAN treatment due to the long half-life of DIFLUCAN (see section 4.3).

*Alfentanil*

A study observed a reduction in clearance and distribution volume as well as prolongation of  $t_{1/2}$  of alfentanil following concomitant treatment with DIFLUCAN. A possible mechanism of action is DIFLUCAN's inhibition of CYP3A4. Dosage adjustment of alfentanil may be necessary.

*Amitriptyline, nortriptyline*

DIFLUCAN increases the effect of amitriptyline and nortriptyline. 5-nortriptyline and/or S-amitriptyline may be measured at initiation of the combination therapy and after one week. Dosage of amitriptyline/nortriptyline should be adjusted, if necessary.

*Amphotericin B*

Concurrent administration of DIFLUCAN and amphotericin B in infected normal and immunosuppressed mice showed the following results: a small additive antifungal effect in systemic infection with *C. albicans*, no interaction in intracranial infection with *Cryptococcus neoformans*, and antagonism of the two medicines in systemic infection with *Aspergillus fumigatus*. The clinical significance of results obtained in these studies is unknown.

*Anticoagulants*

In an interaction study, DIFLUCAN increased the prothrombin time/international normalised ratio (INR) (12

%) after warfarin administration in healthy males. In post-marketing experience, bleeding events (bruising, epistaxis, gastrointestinal bleeding, haematuria, and melena) have been reported, in association with increases in prothrombin time/INR in patients receiving DIFLUCAN concurrently with warfarin. Prothrombin time in patients receiving coumarin-type (warfarin) or indanedione anticoagulants should be carefully monitored. Dose adjustment of these anticoagulants may be necessary.

#### *Azithromycin*

There was no significant pharmacokinetic interaction between DIFLUCAN and azithromycin.

#### *Benzodiazepines (short-acting), i.e. midazolam, triazolam*

Following oral administration of midazolam, DIFLUCAN resulted in substantial increases in midazolam concentrations and psychomotor effects. This effect on midazolam appears to be more pronounced following oral administration of DIFLUCAN than with DIFLUCAN administered intravenously. If concomitant benzodiazepine therapy is necessary in patients being treated with DIFLUCAN, consideration should be given to decreasing the benzodiazepine dosage, and the patients should be appropriately monitored.

DIFLUCAN increases the AUC of triazolam (single dose) by approximately 50 %,  $C_{max}$  by 20 – 32 % and increases  $t_{1/2}$  by 25 – 50 % due to the inhibition of metabolism of triazolam. Dosage adjustments of triazolam may be necessary.

#### *Carbamazepine*

DIFLUCAN inhibits the metabolism of carbamazepine and an increase in serum carbamazepine of 30 % has been observed. There is a risk of developing carbamazepine toxicity. Dosage adjustment of carbamazepine may be necessary depending on concentration measurements/effect.

#### *Calcium channel blockers*

Certain calcium channel antagonists (nifedipine, isradipine, amlodipine, verapamil and felodipine) are metabolised by CYP3A4. DIFLUCAN has the potential to increase the systemic exposure of the calcium



channel antagonists. Frequent monitoring for adverse events is recommended.

#### *Celecoxib*

During concomitant treatment with DIFLUCAN (200 mg daily) and celecoxib (200 mg) the celecoxib  $C_{max}$  and AUC increased by 68 % and 134 %, respectively. A 50 % reduction of the celecoxib dose may be necessary when combined with DIFLUCAN.

#### *Ciclosporin*

DIFLUCAN significantly increases the concentration and AUC of ciclosporin. This combination may be used by reducing the dosage of ciclosporin depending on ciclosporin concentration.

#### *Cyclophosphamide*

Combination therapy with cyclophosphamide and DIFLUCAN results in an increase in serum bilirubin and serum creatinine. The combination may be used while taking increased consideration to the risk of increased serum bilirubin and serum creatinine.

#### *Endogenous steroid*

No adverse effect has been seen on endogenous steroid levels or on ACTH stimulated cortisol response.

#### *Fentanyl*

One fatal case of possible fentanyl DIFLUCAN interaction was reported. The author judged that the patient died from fentanyl intoxication. Furthermore, in a randomised crossover study with twelve healthy volunteers it was shown that DIFLUCAN delayed the elimination of fentanyl significantly. Elevated fentanyl concentration may lead to respiratory depression.

#### *HMG-CoA reductase inhibitors*

The risk of myopathy and rhabdomyolysis increases when DIFLUCAN is co-administered with HMG-CoA reductase inhibitors metabolised through CYP3A4, such as atorvastatin and simvastatin, or through

CYP2C9, such as fluvastatin. If concomitant therapy is necessary, the patient should be observed for symptoms of myopathy and rhabdomyolysis and creatine kinase should be monitored. HMG-CoA reductase inhibitors should be discontinued if a marked increase in creatine kinase is observed, or myopathy/rhabdomyolysis is diagnosed or suspected.

#### *Ibrutinib*

Moderate inhibitors of CYP3A4 such as DIFLUCAN increase plasma ibrutinib concentrations and may increase risk of toxicity. If the combination cannot be avoided, reduce the dose of ibrutinib to 280 mg once daily (two capsules) for the duration of the inhibitor use and provide close clinical monitoring.

#### *Losartan*

DIFLUCAN inhibits the metabolism of losartan to its active metabolite (E-31 74) which is responsible for most of the angiotensin II-receptor antagonism which occurs during treatment with losartan. Patients should have their blood pressure monitored regularly.

#### *Methadone*

DIFLUCAN may enhance the serum concentration of methadone. Dosage adjustment of methadone may be necessary.

#### *Non-steroidal anti-inflammatory drugs (NSAIDs)*

The  $C_{max}$  and AUC of flurbiprofen were increased by 23 % and 81 %, respectively, when co-administered with DIFLUCAN compared to administration of flurbiprofen alone. Similarly, the  $C_{max}$  and AUC of the pharmacologically active isomer [S-(+)-ibuprofen] were increased by 15 % and 82 %, respectively, when DIFLUCAN was co-administered with racemic ibuprofen (400 mg) compared to administration of racemic ibuprofen alone.

Although not specifically studied, DIFLUCAN has the potential to increase the systemic exposure of other NSAIDs that are metabolised by CYP2C9 (e.g. naproxen, lornoxicam, meloxicam, diclofenac). Frequent

monitoring for adverse events and toxicity related to NSAIDs is recommended. Adjustment of dosage of NSAIDs may be needed.

#### *Olaparib*

Moderate inhibitors of CYP3A4 such as DIFLUCAN increase olaparib plasma concentrations; concomitant use is not recommended. If the combination cannot be avoided, limit the dose of olaparib to 200 mg twice daily.

#### *Oral contraceptives*

Two pharmacokinetic studies with a combined oral contraceptive have been performed using multiple doses of DIFLUCAN. There were no relevant effects on hormone level in the 50 mg DIFLUCAN study, while at 200 mg daily, the AUCs of ethinylestradiol and levonorgestrel were increased 40 % and 24 %, respectively. Thus, multiple dose use of DIFLUCAN at these doses is unlikely to have an effect on the efficacy of the combined oral contraceptive.

#### *Phenytoin*

DIFLUCAN inhibits the hepatic metabolism of phenytoin. With co-administration, serum phenytoin concentration levels should be monitored in order to avoid phenytoin toxicity.

#### *Prednisone*

There was a case report that a liver-transplanted patient treated with prednisone developed acute adrenal insufficiency when a three-month therapy with DIFLUCAN was discontinued. The discontinuation of DIFLUCAN presumably caused an enhanced CYP3A4 activity which led to increased metabolism of prednisone. Patients on long-term treatment with DIFLUCAN and prednisone should be carefully monitored for adrenal insufficiency when DIFLUCAN is discontinued (see section 4.4).

#### *Rifabutin*

There have been reports that an interaction exists when DIFLUCAN is administered concomitantly with

rifabutin, leading to increased serum levels of rifabutin up to 80 %. There have been reports of uveitis in patients to whom DIFLUCAN and rifabutin were co-administered. Patients receiving rifabutin and DIFLUCAN concomitantly should be carefully monitored.

#### *Saquinavir*

DIFLUCAN increases the AUC of saquinavir with approximately 50 %,  $C_{max}$  by approximately 55 % and decreases the clearance of saquinavir by approximately 50 % due to inhibition of saquinavir's hepatic metabolism by CYP3A4 and inhibition of P-glycoprotein. Dosage adjustment of saquinavir may be necessary.

#### *Sirolimus*

DIFLUCAN increases plasma concentrations of sirolimus presumably by inhibiting the metabolism of sirolimus via CYP3A4 and P-glycoprotein. This combination may be used with a dosage adjustment of sirolimus depending on the effect/concentration measurements.

#### *Sulfonylureas*

DIFLUCAN has been shown to prolong the serum half-life of concomitantly administered oral sulfonylureas (e.g., chlorpropamide, glibenclamide, glipizide, tolbutamide) in healthy volunteers. Frequent monitoring of blood glucose and appropriate reduction of sulfonylurea dosage is recommended during co-administration.

#### *Tacrolimus*

DIFLUCAN may increase the serum concentrations of orally administered tacrolimus up to 5 times due to inhibition of tacrolimus metabolism through CYP3A4 in the intestines. No significant pharmacokinetic changes have been observed when tacrolimus is given intravenously. Increased tacrolimus levels have been associated with nephrotoxicity. Dosage of orally administered tacrolimus should be decreased depending on tacrolimus concentration.

#### *Theophylline*

In a placebo-controlled interaction study, the administration of DIFLUCAN 200 mg for 14 days resulted in an 18 % decrease in the mean plasma clearance rate of theophylline. Patients who are receiving high dose theophylline or who are otherwise at increased risk for theophylline toxicity should be observed for signs of theophylline toxicity while receiving DIFLUCAN and therapy modified appropriately if signs of toxicity develop.

#### *Tofacitinib*

Exposure of tofacitinib is increased when tofacitinib is co-administered with medicines that result in both moderate inhibition of CYP3A4 and strong inhibition of CYP2C19 (e.g. DIFLUCAN). Therefore, it is recommended to reduce tofacitinib dose to 5 mg once daily when it is combined with these medicines.

#### *Tolvaptan*

Exposure to tolvaptan is significantly increased (200 % in AUC; 80 % in  $C_{max}$ ) when tolvaptan, a CYP3A4 substrate, is co-administered with DIFLUCAN, a moderate CYP3A4 inhibitor, with risk of significant increase in adverse reactions particularly significant diuresis, dehydration and acute renal failure. In case of concomitant use, the tolvaptan dose should be reduced as instructed in the tolvaptan prescribing information and the patient should be frequently monitored for any adverse reactions associated with tolvaptan.

#### *Vinca alkaloids*

Although not studied, DIFLUCAN may increase the plasma levels of the vinca alkaloids (e.g., vincristine and vinblastine) and lead to neurotoxicity, which is possibly due to an inhibitory effect on CYP3A4.

#### *Vitamin A*

Based on a case-report in one patient receiving combination therapy with all-trans-retinoid acid (an acid form of vitamin A) and DIFLUCAN, pseudotumour *cerebri*, which disappeared after discontinuation of DIFLUCAN treatment occurred. Potential central nervous system (CNS) adverse events should be monitored for when this combination of medicines is used.

*Voriconazole (CYP2C9, CYP2C19 and CYP3A4 inhibitor)*

Concurrent administration of oral voriconazole (400 mg every 12 hours for 1 day, then 200 mg every 12 hours for 2,5 days) and oral DIFLUCAN (400 mg on day 1, then 200 mg every 24 hours for 4 days) to 8 healthy male subjects resulted in an increase in  $C_{max}$ , and  $AUC_T$ , of voriconazole by an average of 57 % (90 % CI: 20 %, 107 %) and 79 % (90 % CI: 40 %, 128 %), respectively. In a follow-on clinical study involving 8 healthy male subjects, reduced dosing and/or frequency of voriconazole and DIFLUCAN did not eliminate or diminish this effect. Concomitant administration of voriconazole and DIFLUCAN at any dose is not recommended.

*Zidovudine*

DIFLUCAN increases  $C_{max}$  and AUC of zidovudine by 84 % and 74 %, respectively, due to an approximately 45 % decrease in oral zidovudine clearance. The half-life of zidovudine was likewise prolonged by approximately 128 % following combination therapy with DIFLUCAN. Patients receiving this combination should be monitored for the development of zidovudine-related adverse reactions. Dosage reduction of zidovudine may be considered.

Medical practitioners should be aware that drug-drug interaction studies with other medicines have not been conducted, but such interactions may occur.

#### **4.6 Fertility, pregnancy and lactation**

##### **Women of childbearing potential/contraception in males and females**

Effective contraceptive measures must be used in women of childbearing potential and should continue throughout the treatment period and for approximately 1 week (5 to 6 half-lives) after the final dose.

##### **Pregnancy**

DIFLUCAN is contraindicated for use during pregnancy (see section 4.3).

There have been reports of congenital abnormalities in infants whose mothers were treated with

## DIFLUCAN.

There have been reports of multiple congenital abnormalities in infants whose mothers were being treated for 3 or more months with high dose (400 to 800 mg/day) DIFLUCAN therapy for coccidioidomycosis.

A few published case reports describe a distinctive and a rare pattern of birth defects among infants whose mother received high-dose (400 to 800 mg/day) DIFLUCAN during most or all of the first trimester of pregnancy. The features seen in these infants include: brachycephaly, abnormal facies, abnormal calvarial development, cleft palate, femoral bowing, thin ribs and long bones, arthrogryposis, and congenital heart disease.

### **Breastfeeding**

DIFLUCAN is found in breast milk at concentrations similar to plasma.

DIFLUCAN should not be used in mothers breastfeeding their infants.

### **4.7 Effects on ability to drive and use machines**

When driving vehicles or operating machines, it should be taken into account that dizziness or seizures may occur.

### **4.8 Undesirable effects**

#### *Summary of the safety profile*

In some patients, particularly those with serious underlying diseases such as AIDS and cancer, changes in renal and haematological function test results and hepatic abnormalities have been observed during treatment with DIFLUCAN.

Drug reaction with eosinophilia and systemic symptoms (DRESS) has been reported in association with DIFLUCAN treatment (see section 4.4).

*Tabulated summary of adverse reactions*

The following undesirable effects have been observed and reported during treatment with DIFLUCAN with the following frequencies: Very common ( $\geq 1/10$ ); common ( $\geq 1/100$  to  $< 1/10$ ); uncommon ( $\geq 1/1\ 000$  to  $\leq 1/100$ ); rare ( $\geq 1/10\ 000$  to  $\leq 1/1\ 000$ ); very rare ( $\leq 1/10\ 000$ ); not known (cannot be estimated from the available data).

<b>System organ class</b>	<b>Frequency</b>	<b>Undesirable effects</b>
<i>Blood and lymphatic system disorders</i>	Rare	Agranulocytosis, leukopenia, neutropenia, thrombocytopenia
<i>Immune system disorders</i>	Rare	Anaphylaxis
<i>Metabolism and nutrition disorders</i>	Rare	Hypertriglyceridaemia, hypercholesterolaemia, hypokalaemia
<i>Psychiatric disorders</i>	Uncommon	Insomnia, somnolence
<i>Nervous system disorders</i>	Common	Headache
	Uncommon	Seizures, dizziness, paraesthesia, taste perversion
	Rare	Tremor
<i>Ear and labyrinth disorders</i>	Uncommon	Vertigo
<i>Cardiac disorders</i>	Rare	<i>Torsades de pointes</i> , QT prolongation
<i>Gastrointestinal</i>	Common	Abdominal pain, diarrhoea,



<i>disorders</i>		nausea, vomiting
	Uncommon	Dyspepsia, flatulence, dry mouth
<i>Hepato-biliary disorders</i>	Common	Increased alanine aminotransferase, increased aspartate aminotransferase, increased blood alkaline phosphatase
	Uncommon	Cholestasis, jaundice, increased bilirubin
	Rare	Hepatic toxicity including fatal cases, hepatic failure, hepatocellular necrosis, hepatitis, hepatocellular damage
<i>Skin and subcutaneous tissue disorders</i>	Common	Rash
	Uncommon	Pruritus, urticaria, increased sweating, drug eruption (including fixed drug eruption)
	Rare	Toxic epidermal necrolysis, Stevens-Johnson syndrome, acute generalised exanthematous-pustulosis, exfoliative dermatitis, angioedema, face oedema, alopecia
	Not known	Drug reaction with

		eosinophilia and systemic symptoms (DRESS)
<i>Musculoskeletal and connective tissue disorders</i>	Uncommon	Myalgia
<i>General disorders and administration site conditions</i>	Uncommon	Fatigue, malaise, asthenia, fever

### **Paediatric population**

The pattern and incidence of adverse events and laboratory abnormalities recorded during paediatric clinical trials are comparable to those seen in adults.

#### *Reporting of suspected adverse reactions*

Reporting suspected adverse reactions after authorisation of the medicine is important. It allows continued monitoring of the benefit/risk balance of the medicine. Health care providers are asked to report any suspected adverse reactions to SAHPRA via the “**6.04 Adverse Drug Reactions Reporting Form**”, found online under SAHPRA’s publications: <https://www.sahpra.org.za/Publications/Index/8>

### **4.9 Overdose**

There have been reports of overdose with DIFLUCAN accompanied by hallucinations and paranoid behaviour.

In the advent of overdosage, symptomatic treatment (with supportive measures and gastric lavage if necessary) may be adequate.

DIFLUCAN is largely excreted in the urine; forced volume diuresis would probably increase the elimination rate. A three-hour haemodialysis session decreases plasma levels by approximately 50 %.

## 5. PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Category and class: A 20.2.2 Fungicides

#### *Mechanism of action*

Fluconazole, a member of the triazole antifungal medicines, is an inhibitor of fungal sterol synthesis.

There have been reports of superinfection with *Candida* species other than *C. albicans*, which often have inherently reduced susceptibility (*C. glabrata*) or resistance to fluconazole (e.g. *C. krusei*, *C. auris*). Such infections may require alternative antifungal therapy.

Fluconazole is specific for fungal cytochrome P-450 dependant enzymes. Fluconazole has been shown not to affect testosterone plasma concentrations in males or steroid concentrations in females of child-bearing age.

### 5.2 Pharmacokinetic properties

The pharmacokinetic properties of fluconazole are similar following administration by the intravenous or oral route.

#### *Absorption*

After oral administration in adults, fluconazole is well absorbed, and plasma levels (and systemic bioavailability) are over 90 % of the levels achieved after intravenous administration. Oral absorption is not affected by concomitant food intake. Peak plasma concentrations in the fasting state occur between 0,5 and 1,5 hours post dose. Plasma concentrations are proportional to dose. 90 % steady state levels are reached by day 4 – 5 with multiple once daily dosing. Administration of a loading dose (on day 1) of twice the usual daily dose enables plasma levels to approximate to 90 % steady-state levels by day 2.

#### *Distribution*

The apparent volume of distribution approximates to total body water. Plasma protein binding is low (11 – 12 %).

Fluconazole achieves good penetration in all body fluids studied. The levels of fluconazole in saliva and sputum are similar to plasma levels. In patients with fungal meningitis, fluconazole levels in the CSF are approximately 80 % the corresponding plasma levels.

High skin concentration of fluconazole, above serum concentrations, are achieved in the stratum corneum, epidermis-dermis and eccrine sweat. Fluconazole accumulates in the stratum corneum. At a dose of 50 mg once daily, the concentration of fluconazole after 12 days was 73 µg/g and 7 days after cessation of treatment the concentration was still 5,8 µg/g. At the 150 mg once-a-week dose, the concentration of fluconazole in stratum corneum on day 7 was 23,4 µg/g and 7 days after the second dose was still 7,1 µg/g.

Concentration of fluconazole in nails after 4 months of 150 mg once-a-week dosing was 4,05 µg/g in healthy and 1,8 µg/g in diseased nails; fluconazole was still measurable in nail samples 6 months after the end of therapy.

#### *Elimination*

Plasma elimination half-life for fluconazole is approximately 30 hours. The major route of excretion is renal with approximately 80 % of the administered dose appearing in the urine as unchanged medicine. Fluconazole clearance is proportional to creatinine clearance. There is no evidence of circulating metabolites, but accumulation is significant over 15 days and concentrations may rise 2 – 3 fold.

The long plasma elimination half-life (approximately 30 hours) provides the basis for once daily dosing in the treatment of systemic conditions and single dose therapy for vaginal candidiasis and once-weekly dosing for other indications.

A pharmacokinetic study in 10 lactating women, who had temporarily or permanently stopped breastfeeding

their infants, evaluated fluconazole concentrations in plasma and breast milk for 48 hours following a single 150 mg dose of fluconazole. Fluconazole was detected in breast milk at an average concentration of approximately 98 % of those in maternal plasma. The mean peak breast milk concentration was 2,61 mg/L at 5,2 hours post-dose.

### **Paediatric population**

Pharmacokinetic studies performed in children have shown that fluconazole is cleared faster than in adults, with a half-life of 23 hours. The volume of distribution of fluconazole in children under 1 year of age (950 mL/kg) is higher than in adults (700 mL/kg). Accumulation on multiple daily dosing is therefore less and steady state plasma levels are achieved faster than in adults.

In neonates, the half-lives determined over the first 2 weeks of life are considerably longer than adult values with a mean of 74 hours at day 1 and 47 hours at day 13 of life. The volume of distribution is about 1 200 mL/kg in neonates.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

*DIFLUCAN capsules*

*Capsule content*

Lactose monohydrate

Maize starch

Colloidal silicone dioxide

Magnesium stearate

Sodium lauryl sulphate

*Capsule shell*

Gelatin

Titanium dioxide (E171)

Pfizer Laboratories (Pty) Ltd  
Diflucan capsules 50 mg, 150 mg and 200 mg  
Diflucan IV Infusion 100 mL  
Diflucan 50 mg/5 mL and 200 mg/5 mL Powder for oral suspension  
Final Approved PI – 01 March 2022

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Patent blue (E131)

Erithrosine (E127) (200 mg only)

Indigotine (E132) (200 mg only)

*Printing ink*

Black iron oxide

Shellac

Industrial methylated spirit

N-Butyl alcohol

Soya lecithin

Antifoam DC 1510

*DIFLUCAN IV infusion*

Sodium chloride

Water for injection

*DIFLUCAN powder for oral suspension*

Sucrose

Colloidal anhydrous silica

Titanium dioxide (E171)

Xanthan gum (E415)

Sodium citrate dihydrate

Citric acid anhydrous

Sodium benzoate (E211)

Natural orange flavour

**6.2 Incompatibilities**

*DIFLUCAN capsules*

Not applicable.

*DIFLUCAN IV infusion*

This medicine must not be mixed with other medicines except those mentioned in section 6.6.

*DIFLUCAN powder for oral suspension*

Not applicable.

**6.3 Shelf life**

*DIFLUCAN capsules*

60 months.

*DIFLUCAN IV infusion*

60 months.

*DIFLUCAN powder for oral suspension*

24 months.

**6.4 Special precautions for storage**

*DIFLUCAN capsules*

Store at or below 30 °C.

*DIFLUCAN IV infusion*

Store at or below 30 °C.

Do not freeze.

Discard remaining contents after use.

*DIFLUCAN powder for oral suspension*

Before reconstitution: Store at or below 30 °C in a dry place.

After reconstitution: Store suspension between 30 °C and 5 °C. Protect from freezing. Discard unused portion after 2 weeks.

### **6.5 Nature and contents of container**

DIFLUCAN capsules 50 mg: Blister packs containing 14 capsules.

DIFLUCAN capsules 150 mg: Blister packs containing 1 or 4 capsules.

DIFLUCAN capsules 200 mg: Blister packs containing 28 and 30 capsules.

DIFLUCAN IV infusion: Glass vials each containing 100 mL.

DIFLUCAN 50 mg/5 mL and 200 mg/5 mL powder for oral suspension: Translucent HDPE bottles with child-resistant closures containing 35 mL of reconstituted suspension with a 5 mL overage.

Not all pack sizes may be marketed.

### **6.6 Special precautions for disposal and other handling**

#### *DIFLUCAN capsules*

No special requirements.

#### *DIFLUCAN IV infusion*

DIFLUCAN IV infusion is compatible with the following administration fluids:

- Dextrose 20 %
- Ringer's solution
- Normal saline
- Potassium chloride in dextrose
- Sodium bicarbonate 4,2 %



Although no specific incompatibilities have been noted, mixing with any other medicine prior to infusion is not recommended.

#### *DIFLUCAN powder for oral suspension*

To reconstitute the powder for oral suspension: Tap the bottle to loosen powder. Add 24 mL of water. Shake well. Shake immediately prior to use.

### **7. HOLDER OF CERTIFICATE OF REGISTRATION**

Pfizer Laboratories (Pty) Ltd

85 Bute Lane

Sandton 2196

South Africa

Tel: +27(0)11 320 6000 / 0860 734 937 (Toll-free South Africa)

### **8. REGISTRATION NUMBERS**

DIFLUCAN CAPSULES 50 mg: V/20.2.2/339

DIFLUCAN CAPSULES 150 mg: V/20.2.2/340

DIFLUCAN CAPSULES 200 mg: 28/20.2.2/151

DIFLUCAN IV INFUSION 100 mL: Z/20.2.2/272

DIFLUCAN 50 mg/5 mL: 30/20.2.2/0150

DIFLUCAN 200 mg/5 mL: 30/20.2.2/0151

### **9. DATE OF FIRST AUTHORISATION**

DIFLUCAN CAPSULES 50 mg: 04 Mar 1991

DIFLUCAN CAPSULES 150 mg: 04 Mar 1991

DIFLUCAN CAPSULES 200 mg: 13 Dec 1995

DIFLUCAN IV INFUSION 100 mL: 06 May 1993

DIFLUCAN 50 mg/5 mL and 200 mg/5 mL: 02 May 1997

## 10. DATE OF REVISION OF THE TEXT

01 March 2022

### **BOTSWANA: S2**

DIFLUCAN CAPSULES 50 mg: Reg. No.: B9316300

DIFLUCAN CAPSULES 150 mg: Reg. No.: B9316305

DIFLUCAN CAPSULES 200 mg: Reg. No.: BOT9800296

DIFLUCAN IV INFUSION 100 mL: Reg. No.: BOT0200476

DIFLUCAN 50 mg/5 mL Powder for oral suspension: Reg. No.:  
BOT0200477

### **NAMIBIA: S2**

DIFLUCAN CAPSULES 50 mg: Reg. No.: 04/20.2.2/1244

DIFLUCAN CAPSULES 150 mg: Reg. No.: 04/20.2.2/1245

DIFLUCAN CAPSULES 200 mg: Reg. No.: 01/A20.2.2/003

DIFLUCAN IV INFUSION 100 mL: Reg. No.: 04/20.2.2/1247

DIFLUCAN 50 mg/5 mL Powder for oral suspension: Reg. No.:  
04/20.2.2/1248

DIFLUCAN 200 mg/5 mL Powder for oral suspension: Reg. No.:  
04/20.2.2/1249