1. **NAME OF THE MEDICINAL PRODUCT**

Kaletra 133.3 mg/33.3 mg soft capsules

2. **QUALITATIVE AND QUANTITATIVE COMPOSITION**

Each Kaletra soft capsule contains 133.3 mg of lopinavir co-formulated with 33.3 mg of ritonavir as a pharmacokinetic enhancer.

<table>
<thead>
<tr>
<th>Name of the</th>
<th>Quantity per capsule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>- active substance</strong></td>
<td></td>
</tr>
<tr>
<td>Lopinavir</td>
<td>133.3 mg</td>
</tr>
<tr>
<td>Ritonavir</td>
<td>33.3 mg</td>
</tr>
<tr>
<td><strong>- excipient (s) capsule fill</strong></td>
<td></td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>64.1 mg</td>
</tr>
<tr>
<td>Castor Oil Polyoxyl 35</td>
<td>21.4 mg</td>
</tr>
<tr>
<td><strong>- excipient (s) capsule shell</strong></td>
<td></td>
</tr>
<tr>
<td>Anhydrized liquid sorbitol – glycerol blend</td>
<td>132.2 mg</td>
</tr>
<tr>
<td>Sunset yellow (E110)</td>
<td>0.8 mg</td>
</tr>
</tbody>
</table>

For a full list of excipients, see section 6.1.

3. **PHARMACEUTICAL FORM**

Soft capsule

The capsules are orange with a black ink imprint of [Abbott logo] and “PK”.

4. **CLINICAL PARTICULARS**

4.1 **Therapeutic indications**

Kaletra is indicated for the treatment of HIV-1 infected adults and children above the age of 2 years, in combination with other antiretroviral agents.

Most experience with Kaletra is derived from the use of the product in antiretroviral therapy naïve patients.

The choice of Kaletra to treat protease inhibitor experienced HIV-1 infected patients should be based on individual viral resistance testing and treatment history of patients (see sections 4.4 and 5.1).

4.2 **Posology and method of administration**

Kaletra should be prescribed by physicians who are experienced in the treatment of HIV infection.

*Adult and adolescent use:* the recommended dosage of Kaletra is three capsules twice daily taken with food. Oral solution is available to patients who have difficulty swallowing.

*Paediatric use (2 years of age and above):* the oral solution is the recommended option for the most accurate dosing in children based on body surface area* (please refer to the Kaletra oral solution
Summary of Product Characteristics. However, if it is judged necessary to resort to soft capsules in children, they should be used with particular caution since they are associated with less precise dosing capabilities. Therefore, children receiving soft capsules might have higher exposure (with the risk of increased toxicity) or suboptimal exposure (with the risk of insufficient efficacy). Consequently, when dosing children with soft capsules, therapeutic drug monitoring may be a useful tool to ensure appropriate lopinavir exposure in an individual patient.

<table>
<thead>
<tr>
<th>Paediatric Dosing Guidelines with Soft Capsules</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body Surface Area</strong> <em>(m²)</em></td>
</tr>
<tr>
<td>0.40 – 0.75</td>
</tr>
<tr>
<td>0.80 – 1.3</td>
</tr>
<tr>
<td>1.4 – 1.75</td>
</tr>
</tbody>
</table>

* Body surface area can be calculated with the following equation

\[
\text{BSA (m²)} = \sqrt{\left(\text{Height (cm)} \times \text{Weight (kg)} / 3600\right)}
\]

Children less than 2 years of age: Kaletra is not recommended for use in children below 2 years of age due to insufficient data on safety and efficacy (see section 5.1).

Hepatic impairment: In HIV-infected patients with mild to moderate hepatic impairment, an increase of approximately 30% in lopinavir exposure has been observed but is not expected to be of clinical relevance (see section 5.2). No data are available in patients with severe hepatic impairment. Kaletra should not be given to these patients (see section 4.3).

Renal impairment: since the renal clearance of lopinavir and ritonavir is negligible, increased plasma concentrations are not expected in patients with renal impairment. Because lopinavir and ritonavir are highly protein bound, it is unlikely that they will be significantly removed by haemodialysis or peritoneal dialysis.

4.3 Contraindications

Patients with known hypersensitivity to lopinavir, ritonavir or any of the excipients.

Patients with severe hepatic insufficiency.

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Kaletra should not be co-administered with medicinal products that are highly dependent on CYP3A for clearance and for which elevated plasma concentrations are associated with serious and/or life-threatening events. These medicinal products include astemizole, terfenadine, oral midazolam (for caution on parenterally administered midazolam, see section 4.5), triazolam, cisapride, pimozide, amiodarone, ergot alkaloids (e.g. ergotamine, dihydroergotamine, ergonovine and methylergonovine), lovastatin, simvastatin, sildenafil used for the treatment of pulmonary arterial hypertension (for the use of sildenafil in patients with erectile dysfunction, see section 4.5) and vardenafil.

Herbal preparations containing St John’s wort (*Hypericum perforatum*) must not be used while taking lopinavir and ritonavir due to the risk of decreased plasma concentrations and reduced clinical effects of lopinavir and ritonavir (see section 4.5).
4.4 Special warnings and precautions for use

**Patients with coexisting conditions**

*Hepatic impairment:* the safety and efficacy of Kaletra has not been established in patients with significant underlying liver disorders. Kaletra is contraindicated in patients with severe liver impairment (see section 4.3). Patients with chronic hepatitis B or C and treated with combination antiretroviral therapy are at an increased risk for severe and potentially fatal hepatic adverse reactions. In case of concomitant antiviral therapy for hepatitis B or C, please refer to the relevant product information for these medicinal products.

Patients with pre-existing liver dysfunction including chronic hepatitis have an increased frequency of liver function abnormalities during combination antiretroviral therapy and should be monitored according to standard practice. If there is evidence of worsening liver disease in such patients, interruption or discontinuation of treatment should be considered.

*Renal impairment:* since the renal clearance of lopinavir and ritonavir is negligible, increased plasma concentrations are not expected in patients with renal impairment. Because lopinavir and ritonavir are highly protein bound, it is unlikely that they will be significantly removed by haemodialysis or peritoneal dialysis.

*Haemophilia:* there have been reports of increased bleeding, including spontaneous skin haematoma and haemarthrosis in patients with haemophilia type A and B treated with protease inhibitors. In some patients additional factor VIII was given. In more than half of the reported cases, treatment with protease inhibitors was continued or reintroduced if treatment had been discontinued. A causal relationship had been evoked, although the mechanism of action had not been elucidated. Haemophiliac patients should therefore be made aware of the possibility of increased bleeding.

*Lipid elevations*

Treatment with Kaletra has resulted in increases, sometimes marked, in the concentration of total cholesterol and triglycerides. Triglyceride and cholesterol testing is to be performed prior to initiating Kaletra therapy and at periodic intervals during therapy. Particular caution should be paid to patients with high values at baseline and with history of lipid disorders. Lipid disorders are to be managed as clinically appropriate (see also section 4.5 for additional information on potential interactions with HMG-CoA reductase inhibitors).

*Pancreatitis*

Cases of pancreatitis have been reported in patients receiving Kaletra, including those who developed hypertriglyceridaemia. In most of these cases patients have had a prior history of pancreatitis and/or concurrent therapy with other medicinal products associated with pancreatitis. Marked triglyceride elevation is a risk factor for development of pancreatitis. Patients with advanced HIV disease may be at risk of elevated triglycerides and pancreatitis.

Pancreatitis should be considered if clinical symptoms (nausea, vomiting, abdominal pain) or abnormalities in laboratory values (such as increased serum lipase or amylase values) suggestive of pancreatitis should occur. Patients who exhibit these signs or symptoms should be evaluated and Kaletra therapy should be suspended if a diagnosis of pancreatitis is made (see section 4.8).

*Hyperglycaemia*

New onset diabetes mellitus, hyperglycaemia or exacerbation of existing diabetes mellitus has been reported in patients receiving protease inhibitors. In some of these the hyperglycaemia was severe and in some cases also associated with ketoacidosis. Many patients had confounding medical conditions some of which required therapy with agents that have been associated with the development of diabetes mellitus or hyperglycaemia.
Combination antiretroviral therapy has been associated with redistribution of body fat (lipodystrophy) in HIV patients. The long-term consequences of these events are currently unknown. Knowledge about the mechanism is incomplete. A connection between visceral lipomatosis and protease inhibitors (PIs) and lipatrophy and nucleoside reverse transcriptase inhibitors (NRTIs) has been hypothesised. A higher risk of lipodystrophy has been associated with individual factors such as older age, and with drug related factors such as longer duration of antiretroviral treatment and associated metabolic disturbances. Clinical examination should include evaluation for physical signs of fat redistribution. Consideration should be given to measurement of fasting serum lipids and blood glucose. Lipid disorders should be managed as clinically appropriate (see section 4.8).

Immune Reactivation Syndrome

In HIV-infected patients with severe immune deficiency at the time of institution of combination antiretroviral therapy (CART), an inflammatory reaction to asymptomatic or residual opportunistic pathogens may arise and cause serious clinical conditions, or aggravation of symptoms. Typically, such reactions have been observed within the first few weeks or months of initiation of CART. Relevant examples are cytomegalovirus retinitis, generalised and/or focal mycobacterial infections, and *Pneumocystis jiroveci pneumonia*. Any inflammatory symptoms should be evaluated and treatment instituted when necessary.

Osteonecrosis

Although the etiology is considered to be multifactorial (including corticosteroid use, alcohol consumption, severe immunosuppression, higher body mass index), cases of osteonecrosis have been reported particularly in patients with advanced HIV-disease and/or long-term exposure to combination antiretroviral therapy (CART). Patients should be advised to seek medical advice if they experience joint aches and pain, joint stiffness or difficulty in movement.

PR interval prolongation

Lopinavir/ritonavir has been shown to cause modest asymptomatic prolongation of the PR interval in some healthy adult subjects. Rare reports of 2nd or 3rd degree atrioventricular block in patients with underlying structural heart disease and pre-existing conduction system abnormalities or in patients receiving drugs known to prolong the PR interval (such as verapamil or atazanavir) have been reported in patients receiving lopinavir/ritonavir. Kaletra should be used with caution in such patients (see section 5.1).

Interactions with medicinal products

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Kaletra is likely to increase plasma concentrations of medicinal products that are primarily metabolised by CYP3A. These increases of plasma concentrations of co-administered medicinal products could increase or prolong their therapeutic effect and adverse events (see sections 4.3 and 4.5).

The combination of Kaletra with atorvastatin is not recommended. If the use of atorvastatin is considered strictly necessary, the lowest possible dose of atorvastatin should be administered with careful safety monitoring. Caution must also be exercised and reduced doses should be considered if Kaletra is used concurrently with rosuvastatin. If treatment with a HMG-CoA reductase inhibitor is indicated, pravastatin or fluvastatin is recommended (see section 4.5).

PDE5 inhibitors: particular caution should be used when prescribing sildenafil or tadalafil for the treatment of erectile dysfunction in patients receiving Kaletra. Co-administration of Kaletra with these medicinal products is expected to substantially increase their concentrations and may result in associated adverse events such as hypotension, syncope, visual changes and prolonged erection (see
section 4.5). Concomitant use of vardenafil and lopinavir/ritonavir is contraindicated (see section 4.3). Concomitant use of sildenafil prescribed for the treatment of pulmonary arterial hypertension with Kaletra is contraindicated (see section 4.3).

Particular caution must be used when prescribing Kaletra and medicinal products known to induce QT interval prolongation such as: chlorpheniramine, quinidine, erythromycin, clarithromycin. Indeed, Kaletra could increase concentrations of the co-administered medicinal products and this may result in an increase of their associated cardiac adverse events. Cardiac events have been reported with Kaletra in preclinical studies; therefore, the potential cardiac effects of Kaletra cannot be currently ruled out (see sections 4.8 and 5.3).

Co-administration of Kaletra with rifampicin is not recommended. Rifampicin in combination with Kaletra causes large decreases in lopinavir concentrations which may in turn significantly decrease the lopinavir therapeutic effect. Adequate exposure to lopinavir/ritonavir may be achieved when a higher dose of Kaletra is used but this is associated with a higher risk of liver and gastrointestinal toxicity. Therefore, this co-administration should be avoided unless judged strictly necessary (see section 4.5).

Other

Kaletra is not recommended for use in children less than 2 years of age because of limited efficacy and safety data.

Kaletra is not a cure for HIV infection or AIDS. It does not reduce the risk of passing HIV to others through sexual contact or contamination with blood. Appropriate precautions should be taken. People taking Kaletra may still develop infections or other illnesses associated with HIV disease and AIDS.

Kaletra soft capsules contain sunset yellow [E110] as an excipient, which can cause allergic-type reaction. Allergy is more common in those people who are allergic to aspirin.

Concomitant use of Kaletra and fluticasone or other glucocorticoids that are metabolised by CYP3A4 is not recommended unless the potential benefit of treatment outweighs the risk of systemic corticosteroid effects, including Cushing’s syndrome and adrenal suppression (see section 4.5).

4.5 Interaction with other medicinal products and other forms of interaction

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A in vitro. Co-administration of Kaletra and medicinal products primarily metabolised by CYP3A may result in increased plasma concentrations of the other medicinal product, which could increase or prolong its therapeutic and adverse reactions. Kaletra does not inhibit CYP2D6, CYP2C9, CYP2C19, CYP2E1, CYP2B6 or CYP1A2 at clinically relevant concentrations (see section 4.3).

Kaletra has been shown in vivo to induce its own metabolism and to increase the biotransformation of some medicinal products metabolised by cytochrome P450 enzymes (including CYP2C9 and CYP2C19) and by glucuronidation. This may result in lowered plasma concentrations and potential decrease of efficacy of co-administered medicinal products.

Medicinal products that are contraindicated specifically due to the expected magnitude of interaction and potential for serious adverse events are listed in section 4.3.

Known and theoretical interactions with selected antiretrovirals and non-antiretroviral medicinal products are listed in the table below.

Interaction table

Interactions between Kaletra and co-administered medicinal products are listed in the table below (increase is indicated as “↑”, decrease as “↓”, no change as “→”, once daily as “QD”, twice daily as “BID” and three times daily as "TID").
Unless otherwise stated, studies detailed below have been performed with the recommended dosage of lopinavir/ritonavir (i.e. 400/100 mg twice daily).

<table>
<thead>
<tr>
<th>Co-administered Drug by Therapeutic Area</th>
<th>Effects on drug levels</th>
<th>Clinical Recommendation Concerning Co-Administration with Kaletra</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antiretroviral Agents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nucleoside/Nucleotide reverse transcriptase inhibitors (NRTIs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stavudine, Lamivudine</td>
<td>Lopinavir: ↔</td>
<td>No dose adjustment necessary.</td>
</tr>
<tr>
<td>Abacavir, Zidovudine</td>
<td>Abacavir, Zidovudine:</td>
<td>The clinical significance of reduced abacavir and zidovudine concentrations is unknown.</td>
</tr>
<tr>
<td></td>
<td>Concentrations may be reduced due to increased glucuronidation by Kaletra.</td>
<td></td>
</tr>
<tr>
<td>Tenofovir, 300 mg QD</td>
<td>Tenofovir:</td>
<td>No dose adjustment necessary. Higher tenofovir concentrations could potentiate tenofovir associated adverse events, including renal disorders.</td>
</tr>
<tr>
<td></td>
<td>AUC: ↑ 32%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;max&lt;/sub&gt;: ↔</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;min&lt;/sub&gt;: ↑ 51%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lopinavir: ↔</td>
<td></td>
</tr>
<tr>
<td>Non-nucleoside reverse transcriptase inhibitors (NNRTIs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efavirenz, 600 mg QD</td>
<td>Lopinavir:</td>
<td>The Kaletra tablets dosage should be increased to 500/125 mg twice daily when co-administered with efavirenz.</td>
</tr>
<tr>
<td></td>
<td>AUC: ↓ 20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;max&lt;/sub&gt;: ↓ 13%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;min&lt;/sub&gt;: ↓ 42%</td>
<td></td>
</tr>
<tr>
<td>Efavirenz, 600 mg QD</td>
<td>Lopinavir: ↔</td>
<td></td>
</tr>
<tr>
<td>(Lopinavir/ritonavir 500/125 mg BID)</td>
<td>(Relative to 400/100 mg BID administered alone)</td>
<td></td>
</tr>
<tr>
<td>Nevirapine, 200 mg BID</td>
<td>Lopinavir:</td>
<td>The Kaletra tablets dosage should be increased to 500/125 mg twice daily when co-administered with nevirapine.</td>
</tr>
<tr>
<td></td>
<td>AUC: ↓ 27%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;max&lt;/sub&gt;: ↓ 19%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;min&lt;/sub&gt;: ↓ 51%</td>
<td></td>
</tr>
<tr>
<td>Co-administration with other HIV protease inhibitors (PIs) According to current treatment guidelines, dual therapy with protease inhibitors is generally not recommended.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fosamprenavir/ritonavir (700/100 mg BID)</td>
<td>Fosamprenavir:</td>
<td>Co-administration of increased doses of fosamprenavir (1400 mg BID) with lopinavir/ritonavir (533/133 mg BID) to protease inhibitor-experienced patients resulted in a higher incidence of gastrointestinal adverse events and elevations in triglycerides with the combination regimen without increases in virological efficacy, when compared with standard doses of fosamprenavir/ritonavir. Concomitant administration of these medicinal products is not recommended.</td>
</tr>
<tr>
<td>(Lopinavir/ritonavir 400/100 mg BID)</td>
<td>Amprenavir concentrations are significantly reduced.</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fosamprenavir (1400 mg BID)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Lopinavir/ritonavir 533/133 mg BID)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Combination</td>
<td>Indinavir:</td>
<td>Lopinavir:</td>
</tr>
<tr>
<td>------------------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Indinavir, 600 mg BID</td>
<td>AUC: ↔</td>
<td>Cmin: ↑ 3.5-fold</td>
</tr>
<tr>
<td></td>
<td>Cmax: ↓</td>
<td>(relative to indinavir 800 mg TID alone)</td>
</tr>
<tr>
<td></td>
<td>Lopinavir: ↔</td>
<td>(relative to historical comparison)</td>
</tr>
<tr>
<td>Nelfinavir</td>
<td>Lopinavir: Concentrations ↓</td>
<td>The appropriate doses for this combination, with respect to efficacy and safety, have not been established.</td>
</tr>
<tr>
<td>Saquinavir 1000 mg BID</td>
<td>Saquinavir: ↔</td>
<td>No dose adjustment necessary.</td>
</tr>
<tr>
<td>Tipranavir/ritonavir (500/100 mg BID)</td>
<td>Lopinavir: AUC: ↓ 55%</td>
<td>Concomitant administration of these medicinal products is not recommended.</td>
</tr>
<tr>
<td></td>
<td>Cmin: ↓ 47%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cmax: ↓ 70%</td>
<td></td>
</tr>
<tr>
<td>Acid reducing agents</td>
<td>Omeprazole (40 mg QD)</td>
<td>Omeprazole: ↔</td>
</tr>
<tr>
<td></td>
<td>Lopinavir: ↔</td>
<td></td>
</tr>
<tr>
<td>Ranitidine (150 mg single dose)</td>
<td>Ranitidine: ↔</td>
<td>No dose adjustment necessary</td>
</tr>
<tr>
<td>Analgesics</td>
<td>Fentanyl: Increased risk of side-effects (respiratory depression, sedation) due to higher plasma concentrations because of CYP3A4 inhibition by Kaletra</td>
<td>Careful monitoring of adverse effects (notably respiratory depression but also sedation) is recommended when fentanyl is concomitantly administered with Kaletra.</td>
</tr>
<tr>
<td>Antiarrhythmics</td>
<td>Digoxin: Plasma concentrations may be increased due to P-glycoprotein inhibition by Kaletra. The increased digoxin level may lessen over time as Pgp induction develops.</td>
<td>Caution is warranted and therapeutic drug monitoring of digoxin concentrations, if available, is recommended in case of co-administration of Kaletra and digoxin. Particular caution should be used when prescribing Kaletra in patients taking digoxin as the acute inhibitory effect of ritonavir on Pgp is expected to significantly increase digoxin levels. Initiation of digoxin in patients already taking Kaletra is likely to result in lower than expected increases of digoxin concentrations.</td>
</tr>
<tr>
<td>Bepridil, Systemic Lidocaine, and Quinidine</td>
<td>Bepridil, Systemic Lidocaine, Quinidine: Concentrations may be increased when co-administered with Kaletra.</td>
<td>Caution is warranted and therapeutic drug concentration monitoring is recommended when available.</td>
</tr>
</tbody>
</table>
### Antibiotics

<table>
<thead>
<tr>
<th>Antibiotic</th>
<th>Effect</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarithromycin</td>
<td>Moderate increases in clarithromycin AUC are expected due to CYP3A inhibition by Kaletra.</td>
<td>For patients with renal impairment (CrCL &lt;30 ml/min) dose reduction of clarithromycin should be considered (see section 4.4). Caution should be exercised in administering clarithromycin with Kaletra to patients with impaired hepatic or renal function.</td>
</tr>
</tbody>
</table>

### Anticancer agents

<table>
<thead>
<tr>
<th>Agents</th>
<th>Effect</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most tyrosine kinase inhibitors such as dasatinib and nilotinib, Vincristine, Vinblastine</td>
<td>Risk of increased adverse events due to higher serum concentrations because of CYP3A4 inhibition by Kaletra.</td>
<td>Careful monitoring of the tolerance of these anticancer agents.</td>
</tr>
</tbody>
</table>

### Anticoagulants

<table>
<thead>
<tr>
<th>Agent</th>
<th>Effect</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warfarin</td>
<td>Concentrations may be affected when co-administered with Kaletra due to CYP2C9 induction.</td>
<td>It is recommended that INR (international normalised ratio) be monitored.</td>
</tr>
</tbody>
</table>

### Anticonvulsants

<table>
<thead>
<tr>
<th>Agent</th>
<th>Effect</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenytoin</td>
<td>Steady-state concentrations were moderately decreased due to CYP2C9 and CYP2C19 induction by Kaletra.</td>
<td>Caution should be exercised in administering phenytoin with Kaletra. Phenytoin levels should be monitored when co-administering with lopinavir/ritonavir. When co-administered with phenytoin, an increase of Kaletra dosage may be envisaged. Dose adjustment has not been evaluated in clinical practice.</td>
</tr>
<tr>
<td>Lopinavir</td>
<td>Concentrations are decreased due to CYP3A induction by phenytoin.</td>
<td></td>
</tr>
</tbody>
</table>

Carbamazepine and Phenobarbital

<table>
<thead>
<tr>
<th>Agent</th>
<th>Effect</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbamazepine</td>
<td>Serum concentrations may be increased due to CYP3A inhibition by Kaletra.</td>
<td>Caution should be exercised in administering carbamazepine or phenobarbital with Kaletra. Carbamazepine and phenobarbital levels should be monitored when co-administering with lopinavir/ritonavir. When co-administered with carbamazepine or phenobarbital, an increase of Kaletra dosage may be envisaged. Dose adjustment has not been evaluated in clinical practice.</td>
</tr>
<tr>
<td>Lopinavir</td>
<td>Concentrations may be decreased due to CYP3A induction by carbamazepine and phenobarbital.</td>
<td></td>
</tr>
</tbody>
</table>
### Antidepressants and Anxiolytics

<table>
<thead>
<tr>
<th>Trazodone single dose (Ritonavir, 200 mg BID)</th>
<th>Trazodone: AUC: ↑ 2.4-fold</th>
<th>It is unknown whether the combination of lopinavir/ritonavir causes a similar increase in trazodone exposure. The combination should be used with caution and a lower dose of trazodone should be considered.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adverse events of nausea, dizziness, hypotension and syncope were observed following co-administration of trazodone and ritonavir.</td>
<td></td>
</tr>
</tbody>
</table>

### Antifungals

<table>
<thead>
<tr>
<th>Ketoconazole and Itraconazole</th>
<th>Ketoconazole, Itraconazole: Serum concentrations may be increased due to CYP3A inhibition by Kaletra.</th>
<th>High doses of ketoconazole and itraconazole (&gt; 200 mg/day) are not recommended.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voriconazole</th>
<th>Voriconazole: Concentrations may be decreased.</th>
<th>Co-administration of voriconazole and low dose ritonavir (100 mg BID) as contained in Kaletra should be avoided unless an assessment of the benefit/risk to patient justifies the use of voriconazole.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Antimycobacterials

<table>
<thead>
<tr>
<th>Rifabutin, 150 mg QD</th>
<th>Rifabutin (parent drug and active 25-O-desacetyl metabolite): AUC: ↑ 5.7-fold C\text{max}: ↑ 3.5-fold</th>
<th>On the basis of these data, a rifabutin dose reduction of 75% (i.e. 150 mg every other day or 3 times per week) is recommended when administered with Kaletra. Further reduction may be necessary.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

| Rifampicin | Lopinavir: Large decreases in lopinavir concentrations may be observed due to CYP3A induction by rifampicin. | Co-administration of Kaletra with rifampicin is not recommended as the decrease in lopinavir concentrations may in turn significantly decrease the lopinavir therapeutic effect A dose adjustment of Kaletra 400 mg/400 mg (i.e. Kaletra 400/100 mg + ritonavir 300 mg) twice daily has allowed compensating for the CYP 3A4 inducer effect of rifampicin. However, such a dose adjustment might be associated with ALT/AST elevations and with increase in gastrointestinal disorders. Therefore, this co-administration should be avoided unless judged strictly necessary. If this co-administration is judged unavoidable, increased dose of Kaletra at 400 mg/400 mg twice daily may be administered with rifampicin under close safety and therapeutic drug monitoring. The |
Kaletra dose should be titrated upward only after rifampicin has been initiated (see section 4.4).

**Benzodiazepines**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Oral Midazolam:</th>
<th>Parenteral Midazolam:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midazolam</td>
<td>AUC: ↑ 13-fold</td>
<td>AUC: ↑ 4-fold</td>
</tr>
<tr>
<td></td>
<td>Due to CYP3A inhibition by Kaletra</td>
<td></td>
</tr>
</tbody>
</table>

Kaletra must not be co-administered with oral midazolam (see section 4.3), whereas caution should be used with co-administration of Kaletra and parenteral midazolam. If Kaletra is co-administered with parenteral midazolam, it should be done in an intensive care unit (ICU) or similar setting which ensures close clinical monitoring and appropriate medical management in case of respiratory depression and/or prolonged sedation. Dosage adjustment for midazolam should be considered especially if more than a single dose of midazolam is administered.

**Calcium channel blockers**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Felodipine, Nifedipine, Nicardipine:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Concentrations may be increased</td>
</tr>
<tr>
<td></td>
<td>due to CYP3A inhibition by Kaletra.</td>
</tr>
</tbody>
</table>

Clinical monitoring of therapeutic and adverse effects is recommended when these medicines are concomitantly administered with Kaletra.

**Corticosteroids**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Lopinavir:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexamethasone</td>
<td>Concentrations may be decreased</td>
</tr>
<tr>
<td></td>
<td>due to CYP3A induction by</td>
</tr>
<tr>
<td></td>
<td>dexamethasone.</td>
</tr>
</tbody>
</table>

Clinical monitoring of antiviral efficacy is recommended when these medicines are concomitantly administered with Kaletra.

<table>
<thead>
<tr>
<th>Drug</th>
<th>Fluticasone propionate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluticasone propionate, 50 μg intranasal 4 times daily (100 mg ritonavir BID)</td>
<td>Plasma concentrations ↑</td>
</tr>
<tr>
<td></td>
<td>Cortisol levels ↓ 86%</td>
</tr>
</tbody>
</table>

Greater effects may be expected when fluticasone propionate is inhaled. Systemic corticosteroid effects including Cushing's syndrome and adrenal suppression have been reported in patients receiving ritonavir and inhaled or intranasally administered fluticasone propionate; this could also occur with other corticosteroids metabolised via the P450 3A pathway eg budesonide. Consequently, concomitant administration of Kaletra and these glucocorticoids is not recommended unless the potential benefit of treatment outweighs the risk of systemic corticosteroid effects (see section 4.4). A dose reduction of the glucocorticoid should be considered with close
monitoring of local and systemic effects or a switch to a glucocorticoid, which is not a substrate for CYP3A4 (eg beclomethasone). Moreover, in case of withdrawal of glucocorticoids progressive dose reduction may have to be performed over a longer period.

### Erectile Dysfunction, Phosphodiesterase(PDE5) inhibitors

<table>
<thead>
<tr>
<th>Drug</th>
<th>Effect</th>
<th>Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tadalafil</td>
<td>AUC: ↑2-fold Due to CYP3A inhibition by Kaletra.</td>
<td>Particular caution must be used when prescribing sildenafil or tadalafil in patients receiving Kaletra with increased monitoring for adverse events including hypotension, syncope, visual changes and prolonged erection (see section 4.4). When co-administered with Kaletra, sildenafil doses must not exceed 25 mg in 48 hours and tadalafil doses must not exceed 10 mg every 72 hours. Co-administration of Kaletra with sildenafil used for the treatment of pulmonary arterial hypertension is contra-indicated (see section 4.3).</td>
</tr>
<tr>
<td>Sildenafil</td>
<td>AUC: ↑11-fold Due to CYP3A inhibition by Kaletra.</td>
<td></td>
</tr>
<tr>
<td>Vardenafil</td>
<td>AUC: ↑49-fold Due to CYP3A inhibition by Kaletra.</td>
<td>The use of vardenafil with Kaletra is contraindicated (see section 4.3).</td>
</tr>
</tbody>
</table>

### Herbal products

<table>
<thead>
<tr>
<th>Product</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>St John’s wort</td>
<td>Concentrations may be reduced due to induction of CYP3A by the herbal preparation St John’s wort.</td>
</tr>
<tr>
<td>Lopinavir</td>
<td>Herbal preparations containing St John’s wort must not be combined with lopinavir and ritonavir.</td>
</tr>
<tr>
<td>Herbal preparations</td>
<td>If a patient is already taking St John’s wort, stop St John’s wort and if possible check viral levels. Lopinavir and ritonavir levels may increase on stopping St John’s wort. The dose of Kaletra may need adjusting. The inducing effect may persist for at least 2 weeks after cessation of treatment with St John’s wort (see section 4.3). Therefore, Kaletra can be started safely 2 weeks after cessation of St. John’s wort.</td>
</tr>
</tbody>
</table>

### Immunosuppressants

<table>
<thead>
<tr>
<th>Product</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclosporin, Sirolimus</td>
<td>Concentrations may be increased due to CYP3A inhibition by Kaletra.</td>
</tr>
<tr>
<td>(rapamycin), and Tacrolimus</td>
<td>More frequent therapeutic concentration monitoring is recommended until plasma levels of these products have been stabilised.</td>
</tr>
<tr>
<td><strong>Lipid lowering agents</strong></td>
<td></td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td><strong>Lovastatin and Simvastatin</strong></td>
<td>Lovastatin, Simvastatin: Markedly increased plasma concentrations due to CYP3A inhibition by Kaletra.</td>
</tr>
<tr>
<td><strong>Atorvastatin</strong></td>
<td>Atorvastatin: AUC: ↑ 5.9-fold C&lt;sub&gt;max&lt;/sub&gt;: ↑ 4.7-fold Due to CYP3A inhibition by Kaletra.</td>
</tr>
<tr>
<td><strong>Rosuvastatin, 20 mg QD</strong></td>
<td>Rosuvastatin: AUC: ↑ 2-fold C&lt;sub&gt;max&lt;/sub&gt;: ↑ 5-fold While rosuvastatin is poorly metabolised by CYP3A4, an increase of its plasma concentrations was observed. The mechanism of this interaction may result from inhibition of transport proteins.</td>
</tr>
<tr>
<td><strong>Fluvastatin or Pravastatin</strong></td>
<td>Fluvastatin, Pravastatin: No clinical relevant interaction expected. Pravastatin is not metabolised by CYP450. Fluvastatin is partially metabolised by CYP2C9.</td>
</tr>
<tr>
<td><strong>Opioids</strong></td>
<td></td>
</tr>
<tr>
<td>Buprenorphine, 16 mg QD</td>
<td>Buprenorphine: ↔</td>
</tr>
<tr>
<td>Methadone</td>
<td>Methadone: ↓</td>
</tr>
<tr>
<td><strong>Oral Contraceptives</strong></td>
<td></td>
</tr>
<tr>
<td>Ethinyl Oestadiol</td>
<td>Ethinyl Oestadiol: ↓</td>
</tr>
<tr>
<td><strong>Smoking cessation aids</strong></td>
<td></td>
</tr>
<tr>
<td>Bupropion</td>
<td>Bupropion and its active metabolite, hydroxybupropion: AUC and C&lt;sub&gt;max&lt;/sub&gt; ↓ ~50% This effect may be due to induction of bupropion metabolism.</td>
</tr>
</tbody>
</table>
Other medicinal products

Based on known metabolic profiles, clinically significant interactions are not expected between Kaletra and dapsone, trimethoprim/sulfamethoxazole, azithromycin or fluconazole.

4.6 Pregnancy and lactation

There are no data from the use of Kaletra in pregnant women. Studies in animals have shown reproductive toxicity (see section 5.3). The potential risk for humans is unknown. Kaletra should not be used during pregnancy unless clearly necessary.

Studies in rats revealed that lopinavir is excreted in the milk. It is not known whether this medicinal product is excreted in human milk. HIV infected women must not breast-feed their infants under any circumstances to avoid transmission of HIV.

4.7 Effects on ability to drive and use machines

No studies on the effects on the ability to drive and use machines have been performed. Patients should be informed that nausea has been reported during treatment with Kaletra (see section 4.8).

4.8 Undesirable effects

a. Summary of the safety profile

The safety of Kaletra has been investigated in over 2600 patients in Phase II-IV clinical trials, of which over 700 have received a dose of 800/200 mg (6 capsules or 4 tablets) once daily. Along with nucleoside reverse transcriptase inhibitors (NRTIs), in some studies, Kaletra was used in combination with efavirenz or nevirapine.

The most common adverse reactions related to Kaletra therapy during clinical trials were diarrhoea, nausea, vomiting, hypertriglyceridaemia and hypercholesterolemia. Diarrhoea, nausea and vomiting may occur at the beginning of the treatment while hypertriglyceridaemia and hypercholesterolemia may occur later. Treatment emergent adverse events led to premature study discontinuation for 7% of subjects from Phase II-IV studies.

It is important to note that cases of pancreatitis have been reported in patients receiving Kaletra, including those who developed hypertriglyceridaemia. Furthermore, rare increases in PR interval have been reported during Kaletra therapy (see section 4.4: sections pancreatitis and lipid elevations).

b. Tabulated list of adverse reactions

Adverse reactions from clinical trials and post-marketing experience in adult and paediatric patients:

The safety of Kaletra has been investigated in over 2600 patients in Phase II-IV clinical trials, of which over 700 have received a dose of 800/200 mg (6 capsules or 4 tablets) once daily. Along with NRTIs, in some studies, Kaletra was used in combination with efavirenz or nevirapine.

The following events have been identified as adverse reactions. The frequency category includes all reported events of moderate to severe intensity, regardless of the individual causality assessment. The adverse reactions are displayed by system organ class. Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness: very common (≥1/10), common (≥ 1/100 to < 1/10) and uncommon (≥ 1/1000 to < 1/100).
Events noted as having frequency “Not known” were identified via post-marketing surveillance.

<table>
<thead>
<tr>
<th>System organ class</th>
<th>Frequency</th>
<th>Adverse reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections and infestations</td>
<td>Very Common</td>
<td>Upper respiratory tract infection</td>
</tr>
<tr>
<td></td>
<td>Common</td>
<td>Lower respiratory tract infection, skin infections including cellulitis, folliculitis and furuncle</td>
</tr>
<tr>
<td>Blood and lymphatic system disorders</td>
<td>Common</td>
<td>Anaemia, leucopenia, neutropenia, lymphadenopathy</td>
</tr>
<tr>
<td>Immune system disorders</td>
<td>Common</td>
<td>Hypersensitivity including urticaria and angioedema</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Immune reconstitution syndrome</td>
</tr>
<tr>
<td>Endocrine disorders</td>
<td>Uncommon</td>
<td>Hypogonadism</td>
</tr>
<tr>
<td>Metabolism and nutrition disorders</td>
<td>Common</td>
<td>Blood glucose disorders including diabetes mellitus, hypertriglyceridaemia, hypercholesterolemia, weight decreased, decreased appetite</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Weight increased, increased appetite</td>
</tr>
<tr>
<td>Psychiatric disorders</td>
<td>Common</td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Abnormal dreams, libido decreased</td>
</tr>
<tr>
<td>Nervous system disorders</td>
<td>Common</td>
<td>Headache (including migraine), neuropathy (including peripheral neuropathy), dizziness, insomnia</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Cerebrovascular accident, convulsion, dysgeusia, ageusia, tremor</td>
</tr>
<tr>
<td>Eye disorders</td>
<td>Uncommon</td>
<td>Visual impairment</td>
</tr>
<tr>
<td>Ear and labyrinth disorders</td>
<td>Uncommon</td>
<td>Tinnitus, vertigo</td>
</tr>
<tr>
<td>Cardiac disorders</td>
<td>Uncommon</td>
<td>Atherosclerosis such as myocardial infarction, atrioventricular block, tricuspid valve incompetence</td>
</tr>
<tr>
<td>Vascular disorders</td>
<td>Common</td>
<td>Hypertension</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Deep vein thrombosis</td>
</tr>
<tr>
<td>Gastrointestinal disorders</td>
<td>Very common</td>
<td>Diarrhoea, nausea</td>
</tr>
<tr>
<td></td>
<td>Common</td>
<td>Pancreatitis¹, vomiting, gastroesophageal reflux disease, gastroenteritis and colitis, abdominal pain (upper and lower), abdominal distension, dyspepsia, haemorrhoids, flatulence</td>
</tr>
<tr>
<td>Condition</td>
<td>Frequency</td>
<td>Adverse Reaction</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-----------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Gastrointestinal haemorrhage including</td>
<td>Uncommon</td>
<td>Gastrentestinal ulcer, duodenitis, gastritis and rectal haemorrhage, stomatitis</td>
</tr>
<tr>
<td>HEPATOBILIARY DISORDERS</td>
<td>Common</td>
<td>Hepatitis including AST, ALT and GGT increases</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Hepatic steatosis, hepatomegaly, cholangitis, hyperbilirubinemia</td>
</tr>
<tr>
<td></td>
<td>Not known</td>
<td>Jaundice</td>
</tr>
<tr>
<td>SKIN AND SUBCUTANEOUS TISSUE DISORDERS</td>
<td>Common</td>
<td>Lipodystrophy acquired, including facial wasting, rash including maculopapular</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rash, dermatitis/rash including eczema and seborrheic dermatitis, night sweats,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pruritus</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Alopecia, capillaritis, vasculitis</td>
</tr>
<tr>
<td></td>
<td>Not known</td>
<td>Stevens-Johnson syndrome, erythema multiforme</td>
</tr>
<tr>
<td>MUSCULOSKELETAL AND CONNECTIVE TISSUE DISORDERS</td>
<td>Common</td>
<td>Myalgia, musculoskeletal pain including arthralgia and back pain, muscle disorders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>such as weakness and spasms</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Rhabdomyolysis, osteonecrosis</td>
</tr>
<tr>
<td>RENAL AND URINARY DISORDERS</td>
<td>Uncommon</td>
<td>Creatinine clearance decreased, nephritis, haematuria</td>
</tr>
<tr>
<td>REPRODUCTIVE SYSTEM AND BREAST DISORDERS</td>
<td>Common</td>
<td>Erectile dysfunction, menstrual disorders - amenorrhoea, menorrhagia</td>
</tr>
<tr>
<td>GENERAL DISORDERS AND ADMINISTRATION SITE</td>
<td>Common</td>
<td>Fatigue including asthenia</td>
</tr>
<tr>
<td>CONDITIONS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 See Section 4.4 pancreatitis and lipids

c. Description of selected adverse reactions

Cushing’s syndrome has been reported in patients receiving ritonavir and inhaled or intranasally administered fluticasone propionate; this could also occur with other corticosteroids metabolised via the P450 3A pathway e.g. budesonide (see section 4.4 and 4.5).

Increased CPK, myalgia, myositis, and rarely, rhabdomyolysis have been reported with protease inhibitors, particularly in combination with nucleoside reverse transcriptase inhibitors.

Combination antiretroviral therapy has been associated with redistribution of body fat (lipodystrophy) in HIV patients including the loss of peripheral and facial subcutaneous fat, increased intra-abdominal and visceral fat, breast hypertrophy and dorsocervical fat accumulation (buffalo hump).
Combination antiretroviral therapy has been associated with metabolic abnormalities such as hypertriglyceridaemia, hypercholesterolaemia, insulin resistance, hyperglycaemia and hyperlactataemia (see section 4.4).

In HIV-infected patients with severe immune deficiency at the time of initiation of combination antiretroviral therapy (CART), an inflammatory reaction to asymptomatic or residual opportunistic infections may arise (see section 4.4).

Cases of osteonecrosis have been reported, particularly in patients with generally acknowledged risk factors, advanced HIV disease or long-term exposure to combination antiretroviral therapy (CART). The frequency of this is unknown (see section 4.4).

d. Paediatric populations

In children 2 years of age and older, the nature of the safety profile is similar to that seen in adults (see Table in section b).

4.9 Overdose

To date, there is limited human experience of acute overdose with Kaletra.

The adverse clinical signs observed in dogs included salivation, emesis and diarrhoea/abnormal stool. The signs of toxicity observed in mice, rats or dogs included decreased activity, ataxia, emaciation, dehydration and tremors.

There is no specific antidote for overdose with Kaletra. Treatment of overdose with Kaletra is to consist of general supportive measures including monitoring of vital signs and observation of the clinical status of the patient. If indicated, elimination of unabsorbed active substance is to be achieved by emesis or gastric lavage. Administration of activated charcoal may also be used to aid in removal of unabsorbed active substance. Since Kaletra is highly protein bound, dialysis is unlikely to be beneficial in significant removal of the active substance.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmaco-therapeutic group: protease inhibitor, ATC code: J05AE06

Mechanism of action: Lopinavir provides the antiviral activity of Kaletra. Lopinavir is an inhibitor of the HIV-1 and HIV-2 proteases. Inhibition of HIV protease prevents cleavage of the gag-pol polyprotein resulting in the production of immature, non-infectious virus.

Effects on the electrocardiogram: QTcF interval was evaluated in a randomised, placebo and active (moxifloxacin 400 mg once daily) controlled crossover study in 39 healthy adults, with 10 measurements over 12 hours on Day 3. The maximum mean (95% upper confidence bound) differences in QTcF from placebo were 3.6 (6.3) and 13.1(15.8) for 400/100 mg twice daily and supratherapeutic 800/200 mg twice daily LPV/r, respectively. The induced QRS interval prolongation from 6 ms to 9.5 ms with high dose lopinavir/ritonavir (800/200 mg twice daily) contributes to QT prolongation. The two regimens resulted in exposures on Day 3 which were approximately 1.5 and 3-fold higher than those observed with recommended once daily or twice daily LPV/r doses at steady state. No subject experienced an increase in QTcF of ≥60 msec from baseline or a QTcF interval exceeding the potentially clinically relevant threshold of 500 msec.

Modest prolongation of the PR interval was also noted in subjects receiving lopinavir/ritonavir in the same study on Day 3. The mean changes from baseline in PR interval ranged from 11.6 ms to 24.4 ms
in the 12 hour interval post dose. Maximum PR interval was 286 msec and no second or third degree heart block was observed (see section 4.4).

**Antiviral activity in vitro:** the *in vitro* antiviral activity of lopinavir against laboratory and clinical HIV strains was evaluated in acutely infected lymphoblastic cell lines and peripheral blood lymphocytes, respectively. In the absence of human serum, the mean IC₅₀ of lopinavir against five different HIV-1 laboratory strains was 19 nM. In the absence and presence of 50% human serum, the mean IC₅₀ of lopinavir against HIV-1IIIb in MT4 cells was 17 nM and 102 nM, respectively. In the absence of human serum, the mean IC₅₀ of lopinavir was 6.5 nM against several HIV-1 clinical isolates.

**Resistance**

**In vitro selection of resistance:**

HIV-1 isolates with reduced susceptibility to lopinavir have been selected *in vitro*. HIV-1 has been passaged *in vitro* with lopinavir alone and with lopinavir plus ritonavir at concentration ratios representing the range of plasma concentration ratios observed during Kaletra therapy. Genotypic and phenotypic analysis of viruses selected in these passages suggest that the presence of ritonavir, at these concentration ratios, does not measurably influence the selection of lopinavir-resistant viruses. Overall, the *in vitro* characterisation of phenotypic cross-resistance between lopinavir and other protease inhibitors suggest that decreased susceptibility to lopinavir correlated closely with decreased susceptibility to ritonavir and indinavir, but did not correlate closely with decreased susceptibility to amprenavir, saquinavir, and nelfinavir.

**Analysis of resistance in ARV-naïve patients:**

In clinical studies with a limited number of isolates analysed, the selection of resistance to lopinavir has not been observed in naïve patients without significant protease inhibitor resistance at baseline. See further the detailed description of the clinical studies.

**Analysis of resistance in PI-experienced patients:**

The selection of resistance to lopinavir in patients having failed prior protease inhibitor therapy was characterised by analysing the longitudinal isolates from 19 protease inhibitor-experienced subjects in 2 Phase II and one Phase III studies who either experienced incomplete virologic suppression or viral rebound subsequent to initial response to Kaletra and who demonstrated incremental *in vitro* resistance between baseline and rebound (defined as emergence of new mutations or 2-fold change in phenotypic susceptibility to lopinavir). Incremental resistance was most common in subjects whose baseline isolates had several protease inhibitor-associated mutations, but < 40-fold reduced susceptibility to lopinavir at baseline. Mutations V82A, I54V and M46I emerged most frequently. Mutations L33F, I50V and V32I combined with I47V/A were also observed. The 19 isolates demonstrated a 4.3-fold increase in IC₅₀ compared to baseline isolates (from 6.2- to 43-fold, compared to wild-type virus). Genotypic correlates of reduced phenotypic susceptibility to lopinavir in viruses selected by other protease inhibitors. The *in vitro* antiviral activity of lopinavir against 112 clinical isolates taken from patients failing therapy with one or more protease inhibitors was assessed. Within this panel, the following mutations in HIV protease were associated with reduced *in vitro* susceptibility to lopinavir: L10F/I/R/V, K20M/R, L24I, M46I/L, F53L, I54L/T/V, L63P, A71I/L/T/V, V82A/F/T, I84V and L90M. The median EC₅₀ of lopinavir against isolates with 0 – 3, 4 – 5, 6 – 7 and 8 – 10 mutations at the above amino acid positions was 0.8, 2.7 13.5 and 44.0-fold higher than the EC₅₀ against wild type HIV, respectively. The 16 viruses that displayed > 20-fold change in susceptibility all contained mutations at positions 10, 54, 63 plus 82 and/or 84. In addition, they contained a median of 3 mutations at amino acid positions 20, 24, 46, 53, 71 and 90. In addition to the mutations described above, mutations V32I and I47A have been observed in rebound isolates with reduced lopinavir susceptibility from protease inhibitor experienced patients receiving Kaletra therapy, and mutations I47A and L76V have been observed in rebound isolates with reduced lopinavir susceptibility from patients receiving Kaletra therapy.
Conclusions regarding the relevance of particular mutations or mutational patterns are subject to change with additional data, and it is recommended to always consult current interpretation systems for analysing resistance test results.

*Antiviral activity of Kaletra in patients failing protease inhibitor therapy:* the clinical relevance of reduced *in vitro* susceptibility to lopinavir has been examined by assessing the virologic response to Kaletra therapy, with respect to baseline viral genotype and phenotype, in 56 patients previous failing therapy with multiple protease inhibitors. The EC₅₀ of lopinavir against the 56 baseline viral isolates ranged from 0.6 to 96-fold higher than the EC₅₀ against wild type HIV. After 48 weeks of treatment with Kaletra, efavirenz and nucleoside reverse transcriptase inhibitors, plasma HIV RNA ≤ 400 copies/ml was observed in 93% (25/27), 73% (11/15), and 25% (2/8) of patients with < 10-fold, 10 to 40-fold, and > 40-fold reduced susceptibility to lopinavir at baseline, respectively. In addition, virologic response was observed in 91% (21/23), 71% (15/21) and 33% (2/6) patients with 0 − 5, 6 − 7, and 8 − 10 mutations of the above mutations in HIV protease associated with reduced *in vitro* susceptibility to lopinavir. Since these patients had not previously been exposed to either Kaletra or efavirenz, part of the response may be attributed to the antiviral activity of efavirenz, particularly in patients harbouring highly lopinavir resistant virus. The study did not contain a control arm of patients not receiving Kaletra.

*Cross-resistance:* Activity of other protease inhibitors against isolates that developed incremental resistance to lopinavir after Kaletra therapy in protease inhibitor experienced patients: The presence of cross resistance to other protease inhibitors was analysed in 18 rebound isolates that had demonstrated evolution of resistance to lopinavir during 3 Phase II and one Phase III studies of Kaletra in protease inhibitor-experienced patients. The median fold IC₅₀ of lopinavir for these 18 isolates at baseline and rebound was 6.9- and 63-fold, respectively, compared to wild type virus. In general, rebound isolates either retained (if cross-resistant at baseline) or developed significant cross-resistance to indinavir, saquinavir and atazanavir. Modest decreases in amprenavir activity were noted with a median increase of IC₅₀ from 3.7- to 8-fold in the baseline and rebound isolates, respectively. Isolates retained susceptibility to tipranavir with a median increase of IC₅₀ in baseline and rebound isolates of 1.9- and 1.8–fold, respectively, compared to wild type virus. Please refer to the Aptivus Summary of Product Characteristics for additional information on the use of tipranavir, including genotypic predictors of response, in treatment of lopinavir-resistant HIV-1 infection.

*Clinical results*

The effects of Kaletra (in combination with other antiretroviral agents) on biological markers (plasma HIV RNA levels and CD4+ T-cell counts) have been investigated in a controlled studies of Kaletra of 48 to 360 weeks duration.

*Adult Use*

**Patients without prior antiretroviral therapy**

Study M98-863 was a randomised, double-blind trial of 653 antiretroviral treatment naïve patients investigating Kaletra (400/100 mg twice daily) compared to nelfinavir (750 mg three times daily) plus stavudine and lamivudine. Mean baseline CD4+ T-cell count was 259 cells/mm³ (range: 2 to 949 cells/mm³) and mean baseline plasma HIV-1 RNA was 4.9 log₁₀ copies/ml (range: 2.6 to 6.8 log₁₀ copies/ml).
Table 1

<table>
<thead>
<tr>
<th></th>
<th>Kaletra (N=326)</th>
<th>Nelfinavir (N=327)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml*</td>
<td>75%</td>
<td>63%</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml†</td>
<td>67%</td>
<td>52%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>207</td>
<td>195</td>
</tr>
</tbody>
</table>

* intent to treat analysis where patients with missing values are considered virologic failures
† p<0.001

One-hundred thirteen nelfinavir-treated patients and 74 lopinavir/ritonavir-treated patients had an HIV RNA above 400 copies/ml while on treatment from Week 24 through Week 96. Of these, isolates from 96 nelfinavir-treated patients and 51 lopinavir/ritonavir-treated patients could be amplified for resistance testing. Resistance to nelfinavir, defined as the presence of the D30N or L90M mutation in protease, was observed in 41/96 (43%) patients. Resistance to lopinavir, defined as the presence of any primary or active site mutations in protease (see above), was observed in 0/51 (0%) patients. Lack of resistance to lopinavir was confirmed by phenotypic analysis.

Sustained virological response to Kaletra (in combination with nucleoside/nucleotide reverse transcriptase inhibitors) has been also observed in a small Phase II study (M97-720) through 360 weeks of treatment. One hundred patients were originally treated with Kaletra in the study (including 51 patients receiving 400/100 mg twice daily and 49 patients at either 200/100 mg twice daily or 400/200 mg twice daily). All patients converted to open-label Kaletra at the 400/100 mg twice daily dose between week 48 and week 72. Thirty-nine patients (39%) discontinued the study, including 16 (16%) discontinuations due to adverse events, one of which was associated with a death. Sixty-one patients completed the study (35 patients received the recommended 400/100 mg twice daily dose throughout the study).

Table 2

<table>
<thead>
<tr>
<th></th>
<th>Kaletra (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml</td>
<td>61%</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml</td>
<td>59%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>501</td>
</tr>
</tbody>
</table>

Through 360 weeks of treatment, genotypic analysis of viral isolates was successfully conducted in 19 of 28 patients with confirmed HIV RNA above 400 copies/ml revealed no primary or active site mutations in protease (amino acids at positions 8, 30, 32, 46, 47, 48, 50, 82, 84 and 90) or protease inhibitor phenotypic resistance.

Patients with prior antiretroviral therapy

M97-765 is a randomised, double-blind trial evaluating Kaletra at two dose levels (400/100 mg and 400/200 mg, both twice daily) plus nevirapine (200 mg twice daily) and two nucleoside reverse transcriptase inhibitors in 70 single protease inhibitor experienced, non-nucleoside reverse transcriptase inhibitor naïve patients. Median baseline CD4 cell count was 349 cells/mm³ (range 72 to 807 cells/mm³) and median baseline plasma HIV-1 RNA was 4.0 log₁₀ copies/ml (range 2.9 to 5.8 log₁₀ copies/ml).
M98-957 is a randomised, open-label study evaluating Kaletra treatment at two dose levels (400/100 mg and 533/133 mg, both twice daily) plus efavirenz (600 mg once daily) and nucleoside reverse transcriptase inhibitors in 57 multiple protease inhibitor experienced, non-nucleoside reverse transcriptase inhibitor naïve patients. Between week 24 and 48, patients randomised to a dose of 400/100 mg were converted to a dose of 533/133 mg. Median baseline CD₄ cell count was 220 cells/mm³ (range 13 to 1030 cells/mm³).

Paediatric Use

M98-940 was an open-label study of a liquid formulation of Kaletra in 100 antiretroviral naïve (44%) and experienced (56%) paediatric patients. All patients were non-nucleoside reverse transcriptase inhibitor naïve. Patients were randomised to either 230 mg lopinavir/57.5 mg ritonavir per m² or 300 mg lopinavir/75 mg ritonavir per m². Naïve patients also received nucleoside reverse transcriptase inhibitors. Experienced patients received nevirapine plus up to two nucleoside reverse transcriptase inhibitors. Safety, efficacy and pharmacokinetic profiles of the two dose regimens were assessed after 3 weeks of therapy in each patient. Subsequently, all patients were continued on the 300/75 mg per m² dose. Patients had a mean age of 5 years (range 6 months to 12 years) with 14 patients less than 2 years old and 6 patients one year or less. Mean baseline CD₄+ T-cell count was 838 cells/mm³ and mean baseline plasma HIV-1 RNA was 4.7 log₁₀ copies/ml.

5.2 Pharmacokinetic properties

The pharmacokinetic properties of lopinavir co-administered with ritonavir have been evaluated in healthy adult volunteers and in HIV-infected patients; no substantial differences were observed between the two groups. Lopinavir is essentially completely metabolised by CYP3A. Ritonavir inhibits the metabolism of lopinavir, thereby increasing the plasma levels of lopinavir. Across studies,
administration of Kaletra 400/100 mg twice daily yields mean steady-state lopinavir plasma concentrations 15 to 20-fold higher than those of ritonavir in HIV-infected patients. The plasma levels of ritonavir are less than 7% of those obtained after the ritonavir dose of 600 mg twice daily. The \textit{in vitro} antiviral EC\textsubscript{50} of lopinavir is approximately 10-fold lower than that of ritonavir. Therefore, the antiviral activity of Kaletra is due to lopinavir.

\textbf{Absorption:} multiple dosing with 400/100 mg Kaletra twice daily for 2 weeks and without meal restriction produced a mean ± SD lopinavir peak plasma concentration (C\textsubscript{max}) of 12.3 ± 5.4 μg/ml, occurring approximately 4 hours after administration. The mean steady-state trough concentration prior to the morning dose was 8.1 ± 5.7 μg/ml. Lopinavir AUC over a 12 hour dosing interval averaged 113.2 ± 60.5 μg•h/ml. The absolute bioavailability of lopinavir co-formulated with ritonavir in humans has not been established.

\textbf{Effects of food on oral absorption:} Kaletra soft capsules and liquid have been shown to be bioequivalent under nonfasting conditions (moderate fat meal). Administration of a single 400/100 mg dose of Kaletra soft capsules with a moderate fat meal (500 – 682 kcal, 22.7 – 25.1% from fat) was associated with a mean increase of 48% and 23% in lopinavir AUC and C\textsubscript{max}, respectively, relative to fasting. For Kaletra oral solution, the corresponding increases in lopinavir AUC and C\textsubscript{max} were 80% and 54%, respectively. Administration of Kaletra with a high fat meal (872 kcal, 55.8% from fat) increased lopinavir AUC and C\textsubscript{max} by 96% and 43%, respectively, for soft capsules, and 130% and 56%, respectively, for oral solution. To enhance bioavailability and minimise variability Kaletra is to be taken with food.

\textbf{Distribution:} at steady state, lopinavir is approximately 98 − 99% bound to serum proteins. Lopinavir binds to both alpha-1-acid glycoprotein (AAG) and albumin, however, it has a higher affinity for AAG. At steady state, lopinavir protein binding remains constant over the range of observed concentrations after 400/100 mg Kaletra twice daily, and is similar between healthy volunteers and HIV-positive patients.

\textbf{Metabolism:} \textit{in vitro} experiments with human hepatic microsomes indicate that lopinavir primarily undergoes oxidative metabolism. Lopinavir is extensively metabolised by the hepatic cytochrome P450 system, almost exclusively by isozyme CYP3A. Ritonavir is a potent CYP3A inhibitor which inhibits the metabolism of lopinavir and therefore, increases plasma levels of lopinavir. A \textsuperscript{14}C-lopinavir study in humans showed that 89% of the plasma radioactivity after a single 400/100 mg Kaletra dose was due to parent active substance. At least 13 lopinavir oxidative metabolites have been identified in man. The 4-oxo and 4-hydroxymetabolite epimeric pair are the major metabolites with antiviral activity, but comprise only minute amounts of total plasma radioactivity. Ritonavir has been shown to induce metabolic enzymes, resulting in the induction of its own metabolism, and likely the induction of lopinavir metabolism. Pre-dose lopinavir concentrations decline with time during multiple dosing, stabilising after approximately 10 days to 2 weeks.

\textbf{Elimination:} after a 400/100 mg \textsuperscript{14}C-lopinavir/ritonavir dose, approximately 10.4 ± 2.3% and 82.6 ± 2.5% of an administered dose of \textsuperscript{14}C-lopinavir can be accounted for in urine and faeces, respectively. Unchanged lopinavir accounted for approximately 2.2% and 19.8% of the administered dose in urine and faeces, respectively. After multiple dosing, less than 3% of the lopinavir dose is excreted unchanged in the urine. The effective (peak to trough) half-life of lopinavir over a 12 hour dosing interval averaged 5 – 6 hours, and the apparent oral clearance (CL/F) of lopinavir is 6 to 7 l/h.

\textbf{Special Populations}

\textbf{Paediatrics:}

There are limited pharmacokinetic data in children below 2 years of age. The pharmacokinetics of Kaletra 300/75 mg/m\textsuperscript{2} twice daily and 230/57.5 mg/m\textsuperscript{2} twice daily have been studied in a total of 53 paediatric patients, ranging in age from 6 months to 12 years. The lopinavir mean steady-state AUC, C\textsubscript{max}, and C\textsubscript{min} were 72.6 ± 31.1 μg•h/ml, 8.2 ± 2.9 μg/ml and 3.4 ± 2.1 μg/ml, respectively after Kaletra 230/57.5 mg/m\textsuperscript{2} twice daily without nevirapine (n=12), and were 85.8 ± 36.9 μg•h/ml,
10.0 ± 3.3 μg/ml and 3.6 ± 3.5 μg/ml, respectively after 300/75 mg/m² twice daily with nevirapine (n=12). The 230/57.5 mg/m² twice daily regimen without nevirapine and the 300/75 mg/m² twice daily regimen with nevirapine provided lopinavir plasma concentrations similar to those obtained in adult patients receiving the 400/100 mg twice daily regimen without nevirapine. Kaletra soft capsules and Kaletra oral solution are bioequivalent under nonfasting conditions.

Gender, Race and Age:

Kaletra pharmacokinetics have not been studied in the elderly. No age or gender related pharmacokinetic differences have been observed in adult patients. Pharmacokinetic differences due to race have not been identified.

Renal Insufficiency:

Kaletra pharmacokinetics have not been studied in patients with renal insufficiency; however, since the renal clearance of lopinavir is negligible, a decrease in total body clearance is not expected in patients with renal insufficiency.

Hepatic Insufficiency:

The steady state pharmacokinetic parameters of lopinavir in HIV-infected patients with mild to moderate hepatic impairment were compared with those of HIV-infected patients with normal hepatic function in a multiple dose study with lopinavir/ritonavir 400/100 mg twice daily. A limited increase in total lopinavir concentrations of approximately 30% has been observed which is not expected to be of clinical relevance (see section 4.2).

5.3 Preclinical safety data

Repeat-dose toxicity studies in rodents and dogs identified major target organs as the liver, kidney, thyroid, spleen and circulating red blood cells. Hepatic changes indicated cellular swelling with focal degeneration. While exposure eliciting these changes were comparable to or below human clinical exposure, dosages in animals were over 6-fold the recommended clinical dose. Mild renal tubular degeneration was confined to mice exposed with at least twice the recommended human exposure; the kidney was unaffected in rats and dogs. Reduced serum thyroxin led to an increased release of TSH with resultant follicular cell hypertrophy in the thyroid glands of rats. These changes were reversible with withdrawal of the active substance and were absent in mice and dogs. Coombs-negative anisocytosis and poikilocytosis were observed in rats, but not in mice or dogs. Enlarged spleens with histiocytosis were seen in rats but not other species. Serum cholesterol was elevated in rodents but not dogs, while triglycerides were elevated only in mice.

During in vitro studies, cloned human cardiac potassium channels (HERG) were inhibited by 30% at the highest concentrations of lopinavir/ritonavir tested, corresponding to a lopinavir exposure 7-fold total and 15-fold free peak plasma levels achieved in humans at the maximum recommended therapeutic dose. In contrast, similar concentrations of lopinavir/ritonavir demonstrated no repolarisation delay in the canine cardiac Purkinje fibres. Lower concentrations of lopinavir/ritonavir did not produce significant potassium (HERG) current blockade. Tissue distribution studies conducted in the rat did not suggest significant cardiac retention of the active substance; 72-hour AUC in heart was approximately 50% of measured plasma AUC. Therefore, it is reasonable to expect that cardiac lopinavir levels would not be significantly higher than plasma levels.

In dogs, prominent U waves on the electrocardiogram have been observed associated with prolonged PR interval and bradycardia. These effects have been assumed to be caused by electrolyte disturbance. The clinical relevance of these preclinical data is unknown, however, the potential cardiac effects of this product in humans cannot be ruled out (see also sections 4.4 and 4.8).

In rats, embryofetotoxicity (pregnancy loss, decreased foetal viability, decreased foetal body weights, increased frequency of skeletal variations) and postnatal developmental toxicity (decreased survival of
pups) was observed at maternally toxic dosages. The systemic exposure to lopinavir/ritonavir at the maternal and developmental toxic dosages was lower than the intended therapeutic exposure in humans.

Long-term carcinogenicity studies of lopinavir/ritonavir in mice revealed a nongenotoxic, mitogenic induction of liver tumours, generally considered to have little relevance to human risk.

Carcinogenicity studies in rats revealed no tumourigenic findings. Lopinavir/ritonavir was not found to be mutagenic or clastogenic in a battery of in vitro and in vivo assays including the Ames bacterial reverse mutation assay, the mouse lymphoma assay, the mouse micronucleus test and chromosomal aberration assays in human lymphocytes.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Capsule contents:
oleic acid,
propylene glycol,
polyoxyl 35 castor oil,
purified water

Capsule shell:
gelatine,
anhydrized liquid sorbitol (mixture of sorbitol, sorbitol anhydrides and mannitol),
glycerol,
titanium dioxide (E171),
sunset yellow (E110)
medium-chain triglycerides,
lecithin

Black ink containing:
propylene glycol,
black iron oxide (E172),
polyvinyl acetate phthalate,
polyethylene glycol 400,
ammonium hydroxide

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

2 years

6.4 Special precautions for storage

Store in a refrigerator (2°C - 8°C).

In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.

Avoid exposure to excessive heat.
6.5  Nature and content of container


6.6  Special precautions for disposal

No special requirements.

7.  MARKETING AUTHORISATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

8.  MARKETING AUTHORISATION NUMBERS

EU/1/01/172/001
EU/1/01/172/002

9.  DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 20 March 2001
Date of last renewal: 20 March 2006

10.  DATE OF REVISION OF THE TEXT

{MM/YYYY}
1. NAME OF THE MEDICINAL PRODUCT
Kaletra (80 mg + 20 mg) / ml oral solution

2. QUALITATIVE AND QUANTITATIVE COMPOSITION
Each 5 ml of Kaletra oral solution contains 400 mg of lopinavir co-formulated with 100 mg of ritonavir as a pharmacokinetic enhancer.

<table>
<thead>
<tr>
<th>Name of the substance</th>
<th>Quantity per ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lopinavir</td>
<td>80 mg</td>
</tr>
<tr>
<td>Ritonavir</td>
<td>20 mg</td>
</tr>
<tr>
<td>Alcohol (42% v/v)</td>
<td>356.3 mg</td>
</tr>
<tr>
<td>High fructose corn syrup</td>
<td>168.6 mg</td>
</tr>
<tr>
<td>Propylene glycol</td>
<td>152.7 mg</td>
</tr>
<tr>
<td>Glycerol</td>
<td>59.6 mg</td>
</tr>
<tr>
<td>Polyoxyl 40 hydrogenated castor oil</td>
<td>10.2 mg</td>
</tr>
<tr>
<td>Acesulfame potassium</td>
<td>4.1 mg</td>
</tr>
</tbody>
</table>

For a full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM
Oral solution
The solution is light yellow to golden.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications
Kaletra is indicated for the treatment of HIV-1 infected adults and children above the age of 2 years, in combination with other antiretroviral agents.

Most experience with Kaletra is derived from the use of the product in antiretroviral therapy naïve patients.

The choice of Kaletra to treat protease inhibitor experienced HIV-1 infected patients should be based on individual viral resistance testing and treatment history of patients (see sections 4.4 and 5.1).

4.2 Posology and method of administration
Kaletra should be prescribed by physicians who are experienced in the treatment of HIV infection.

Adult and adolescent use: the recommended dosage of Kaletra is 5 ml of oral solution (400/100 mg) twice daily taken with food.
Paediatric use (2 years of age and above): the recommended dosage of Kaletra is 230/57.5 mg/m² twice daily taken with food, up to a maximum dose of 400/100 mg twice daily. The 230/57.5 mg/m²
dosage might be insufficient in some children when co-administered with nevirapine or efavirenz. An increase of the dose of Kaletra to 300/75 mg/m² should be considered in these patients. Dose should be administered using a calibrated oral dosing syringe.

The oral solution is the recommended option for the most accurate dosing in children based on body surface area. However, if it is judged necessary to resort to soft capsules in children, they should be used with particular caution since they are associated with less precise dosing capabilities. Therefore, children receiving soft capsules might have higher exposure (with the risk of increased toxicity) or suboptimal exposure (with the risk of insufficient efficacy). Consequently when dosing children with soft capsules, therapeutic drug monitoring may be a useful tool to ensure appropriate lopinavir exposure in an individual patient.

### Paediatric Dosing Guidelines for the Dose 230/57.5 mg/m²

<table>
<thead>
<tr>
<th>Body Surface Area* (m²)</th>
<th>Twice Daily Oral Solution Dose (dose in mg)</th>
<th>Twice Daily Soft Capsule Dose (dose in mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td>0.7 ml (57.5/14.4 mg)</td>
<td>NA</td>
</tr>
<tr>
<td>0.40</td>
<td>1.2 ml (96/24 mg)</td>
<td>1 soft capsule (133.3/33.3 mg)</td>
</tr>
<tr>
<td>0.50</td>
<td>1.4 ml (115/28.8 mg)</td>
<td>1 soft capsule (133.3/33.3 mg)</td>
</tr>
<tr>
<td>0.75</td>
<td>2.2 ml (172.5/43.1 mg)</td>
<td>1 soft capsule (133.3/33.3 mg)</td>
</tr>
<tr>
<td>0.80</td>
<td>2.3 ml (184/46 mg)</td>
<td>2 soft capsules (266.6/66/6 mg)</td>
</tr>
<tr>
<td>1.00</td>
<td>2.9 ml (230/57.5 mg)</td>
<td>2 soft capsules (266.6/66/6 mg)</td>
</tr>
<tr>
<td>1.25</td>
<td>3.6 ml (287.5/71.9 mg)</td>
<td>2 soft capsules (266.6/66/6 mg)</td>
</tr>
<tr>
<td>1.3</td>
<td>3.7 ml (299/74.8 mg)</td>
<td>2 soft capsules (266.6/66/6 mg)</td>
</tr>
<tr>
<td>1.4</td>
<td>4.0 ml (322/80.5 mg)</td>
<td>3 soft capsules (400/100 mg)</td>
</tr>
<tr>
<td>1.5</td>
<td>4.3 ml (345/86.3 mg)</td>
<td>3 soft capsules (400/100 mg)</td>
</tr>
<tr>
<td>1.7</td>
<td>5 ml (402.5/100.6 mg)</td>
<td>3 soft capsules (400/100 mg)</td>
</tr>
</tbody>
</table>

* Body surface area can be calculated with the following equation

\[
\text{BSA (m}^2\text{)} = \sqrt{(\text{Height (cm) X Weight (kg) } / 3600)}
\]

Children less than 2 years of age: Kaletra is not recommended for use in children below 2 years of age due to insufficient data on safety and efficacy (see section 5.1). Paediatric patients should switch from Kaletra oral solution to soft capsules as soon as they are able to swallow the capsule formulation (see section 4.4).

Hepatic impairment: In HIV-infected patients with mild to moderate hepatic impairment, an increase of approximately 30% in lopinavir exposure has been observed but is not expected to be of clinical relevance. (see section 5.2). No data are available in patients with severe hepatic impairment. Kaletra should not be given to these patients (see section 4.3).

Renal impairment: since the renal clearance of lopinavir and ritonavir is negligible, increased plasma concentrations are not expected in patients with renal impairment. Because lopinavir and ritonavir are highly protein bound, it is unlikely that they will be significantly removed by haemodialysis or peritoneal dialysis.

### 4.3 Contraindications

Patients with known hypersensitivity to lopinavir, ritonavir or any of the excipients.

Patients with severe hepatic insufficiency.

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Kaletra should not be co-administered with medicinal products that are highly dependent on CYP3A for clearance and for which elevated plasma concentrations are associated with serious and/or life threatening events. These medicinal products include astemizole, terfenadine, oral midazolam (for
caution on parenterally administered midazolam, see section 4.5), triazolam, cisapride, pimozide, amiodarone, ergot alkaloids (e.g. ergotamine, dihydroergotamine, ergonovine and methylergonovine), lovastatin, simvastatin, sildenafil used for the treatment of pulmonary arterial hypertension (for the use of sildenafil in patients with erectile dysfunction, see section 4.5) and vardenafil.

Herbal preparations containing St John’s wort (*Hypericum perforatum*) must not be used while taking lopinavir and ritonavir due to the risk of decreased plasma concentrations and reduced clinical effects of lopinavir and ritonavir (see section 4.5).

Kaletra oral solution is contraindicated in children below the age of 2 years, pregnant women, patients with hepatic or renal failure and patients treated with disulfiram or metronidazole due to the potential risk of toxicity from the excipient propylene glycol (see section 4.4).

### 4.4 Special warnings and precautions for use

#### Patients with coexisting conditions

**Hepatic impairment:** the safety and efficacy of Kaletra has not been established in patients with significant underlying liver disorders. Kaletra is contraindicated in patients with severe liver impairment (see section 4.3). Patients with chronic hepatitis B or C and treated with combination antiretroviral therapy are at an increased risk for severe and potentially fatal hepatic adverse reactions. In case of concomitant antiviral therapy for hepatitis B or C, please refer to the relevant product information for these medicinal products.

Patients with pre-existing liver dysfunction including chronic hepatitis have an increased frequency of liver function abnormalities during combination antiretroviral therapy and should be monitored according to standard practice. If there is evidence of worsening liver disease in such patients, interruption or discontinuation of treatment should be considered.

**Renal impairment:** since the renal clearance of lopinavir and ritonavir is negligible, increased plasma concentrations are not expected in patients with renal impairment. Because lopinavir and ritonavir are highly protein bound, it is unlikely that they will be significantly removed by haemodialysis or peritoneal dialysis.

**Haemophilia:** there have been reports of increased bleeding, including spontaneous skin haematoma and haemarthrosis in patients with haemophilia type A and B treated with protease inhibitors. In some patients additional factor VIII was given. In more than half of the reported cases, treatment with protease inhibitors was continued or reintroduced if treatment had been discontinued. A causal relationship had been evoked, although the mechanism of action had not been elucidated. Haemophilic patients should therefore be made aware of the possibility of increased bleeding.

#### Lipid elevations

Treatment with Kaletra has resulted in increases, sometimes marked, in the concentration of total cholesterol and triglycerides. Triglyceride and cholesterol testing is to be performed prior to initiating Kaletra therapy and at periodic intervals during therapy. Particular caution should be paid to patients with high values at baseline and with history of lipid disorders. Lipid disorders are to be managed as clinically appropriate (see also section 4.5 for additional information on potential interactions with HMG-CoA reductase inhibitors).

**Pancreatitis**

Cases of pancreatitis have been reported in patients receiving Kaletra, including those who developed hypertriglyceridaemia. In most of these cases patients have had a prior history of pancreatitis and/or concurrent therapy with other medicinal products associated with pancreatitis. Marked triglyceride elevation is a risk factor for development of pancreatitis. Patients with advanced HIV disease may be at risk of elevated triglycerides and pancreatitis.
Pancreatitis should be considered if clinical symptoms (nausea, vomiting, abdominal pain) or abnormalities in laboratory values (such as increased serum lipase or amylase values) suggestive of pancreatitis should occur. Patients who exhibit these signs or symptoms should be evaluated and Kaletra therapy should be suspended if a diagnosis of pancreatitis is made (see section 4.8).

**Hyperglycaemia**

New onset diabetes mellitus, hyperglycaemia or exacerbation of existing diabetes mellitus has been reported in patients receiving protease inhibitors. In some of these the hyperglycaemia was severe and in some cases also associated with ketoacidosis. Many patients had confounding medical conditions some of which required therapy with agents that have been associated with the development of diabetes mellitus or hyperglycaemia.

**Fat redistribution & metabolic disorders**

Combination antiretroviral therapy has been associated with redistribution of body fat (lipodystrophy) in HIV patients. The long-term consequences of these events are currently unknown. Knowledge about the mechanism is incomplete. A connection between visceral lipomatosis and protease inhibitors (PIs) and lipatrophy and nucleoside reverse transcriptase inhibitors (NRTIs) has been hypothesised. A higher risk of lipodystrophy has been associated with individual factors such as older age, and with drug related factors such as longer duration of antiretroviral treatment and associated metabolic disturbances. Clinical examination should include evaluation for physical signs of fat redistribution. Consideration should be given to measurement of fasting serum lipids and blood glucose. Lipid disorders should be managed as clinically appropriate (see section 4.8).

**Immune Reactivation Syndrome**

In HIV-infected patients with severe immune deficiency at the time of institution of combination antiretroviral therapy (CART), an inflammatory reaction to asymptomatic or residual opportunistic pathogens may arise and cause serious clinical conditions, or aggravation of symptoms. Typically, such reactions have been observed within the first few weeks or months of initiation of CART. Relevant examples are cytomegalovirus retinitis, generalised and/or focal mycobacterial infections, and *Pneumocystis jiroveci pneumonia*. Any inflammatory symptoms should be evaluated and treatment instituted when necessary.

**Osteonecrosis**

Although the etiology is considered to be multifactorial (including corticosteroid use, alcohol consumption, severe immunosuppression, higher body mass index), cases of osteonecrosis have been reported particularly in patients with advanced HIV-disease and/or long-term exposure to combination antiretroviral therapy (CART). Patients should be advised to seek medical advice if they experience joint aches and pain, joint stiffness or difficulty in movement.

**PR interval prolongation**

Lopinavir/ritonavir has been shown to cause modest asymptomatic prolongation of the PR interval in some healthy adult subjects. Rare reports of 2nd or 3rd degree atroventricular block in patients with underlying structural heart disease and pre-existing conduction system abnormalities or in patients receiving drugs known to prolong the PR interval (such as verapamil or atazanavir) have been reported in patients receiving lopinavir/ritonavir. Kaletra should be used with caution in such patients (see section 5.1).

**Interactions with medicinal products**

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Kaletra is likely to increase plasma concentrations of medicinal products that are primarily metabolised by CYP3A. These increases of plasma concentrations of co-administered medicinal
products could increase or prolong their therapeutic effect and adverse events (see sections 4.3 and 4.5).

The combination of Kaletra with atorvastatin is not recommended. If the use of atorvastatin is considered strictly necessary, the lowest possible dose of atorvastatin should be administered with careful safety monitoring. Caution must also be exercised and reduced doses should be considered if Kaletra is used concurrently with rosuvastatin. If treatment with an HMG-CoA reductase inhibitor is indicated, pravastatin or fluvastatin is recommended (see section 4.5).

**PDE5 inhibitors**: particular caution should be used when prescribing sildenafil or tadalafil for the treatment of erectile dysfunction in patients receiving Kaletra. Co-administration of Kaletra with these medicinal products is expected to substantially increase their concentrations and may result in associated adverse events such as hypotension, syncope, visual changes and prolonged erection (see section 4.5). Concomitant use of vardenafil and lopinavir/ritonavir is contraindicated (see section 4.3). Concomitant use of sildenafil prescribed for the treatment of pulmonary arterial hypertension with Kaletra is contraindicated (see section 4.3).

Particular caution must be used when prescribing Kaletra and medicinal products known to induce QT interval prolongation such as: chlorpheniramine, quinidine, erythromycin, clarithromycin. Indeed, Kaletra could increase concentrations of the co-administered medicinal products and this may result in an increase of their associated cardiac adverse events. Cardiac events have been reported with Kaletra in preclinical studies; therefore, the potential cardiac effects of Kaletra cannot be currently ruled out (see sections 4.8 and 5.3).

Co-administration of Kaletra with rifampicin is not recommended. Rifampicin in combination with Kaletra causes large decreases in lopinavir concentrations which may in turn significantly decrease the lopinavir therapeutic effect. Adequate exposure to lopinavir/ritonavir may be achieved when a higher dose of Kaletra is used but this is associated with a higher risk of liver and gastrointestinal toxicity. Therefore, this co-administration should be avoided unless judged strictly necessary (see section 4.5).

**Other**

Patients taking the oral solution, particularly those with renal impairment or with decreased ability to metabolise propylene glycol (e.g. those of Asian origin), should be monitored for adverse reactions potentially related to propylene glycol toxicity (i.e. seizures, stupor, tachycardia, hyperosmolarity, lactic acidosis, renal toxicity, haemolysis) (see section 4.3).

Kaletra is not a cure for HIV infection or AIDS. It does not reduce the risk of passing HIV to others through sexual contact or contamination with blood. Appropriate precautions should be taken. People taking Kaletra may still develop infections or other illnesses associated with HIV disease and AIDS.

Besides propylene glycol as described above, Kaletra oral solution contains alcohol (42% v/v) which is potentially harmful for those suffering from liver disease, alcoholism, epilepsy, brain injury or disease as well as for pregnant women and children. It may modify or increase the effects of other medicines. Kaletra oral solution contains up to 0.8 g of fructose per dose when taken according to the dosage recommendations. This may be unsuitable in hereditary fructose intolerance. Kaletra oral solution contains up to 0.3 g of glycerol per dose. Only at high inadvertent doses, it can cause headache and gastrointestinal upset. Furthermore, polyoxol 40 hydrogenated castor oil and potassium present in Kaletra oral solution may cause only at high inadvertent doses gastrointestinal upset. Patients on a low potassium diet should be cautioned.

Concomitant use of Kaletra and fluticasone or other glucocorticoids that are metabolised by CYP3A4 is not recommended unless the potential benefit of treatment outweighs the risk of systemic corticosteroid effects, including Cushing’s syndrome and adrenal suppression (see section 4.5).
4.5 Interaction with other medicinal products and other forms of interaction

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A in vitro. Co-administration of Kaletra and medicinal products primarily metabolised by CYP3A may result in increased plasma concentrations of the other medicinal product, which could increase or prolong its therapeutic and adverse reactions. Kaletra does not inhibit CYP2D6, CYP2C9, CYP2C19, CYP2E1, CYP2B6 or CYP1A2 at clinically relevant concentrations (see section 4.3).

Kaletra has been shown in vivo to induce its own metabolism and to increase the biotransformation of some medicinal products metabolised by cytochrome P450 enzymes (including CYP2C9 and CYP2C19) and by glucuronidation. This may result in lowered plasma concentrations and potential decrease of efficacy of co-administered medicinal products.

Medicinal products that are contraindicated specifically due to the expected magnitude of interaction and potential for serious adverse events are listed in section 4.3.

Known and theoretical interactions with selected antiretrovirals and non-antiretroviral medicinal products are listed in the table below.

Interaction table

Interactions between Kaletra and co-administered medicinal products are listed in the table below (increase is indicated as “↑”, decrease as “↓”, no change as “↔”, once daily as “QD”, twice daily as “BID” and three times daily as “TID”).

Unless otherwise stated, studies detailed below have been performed with the recommended dosage of lopinavir/ritonavir (i.e. 400/100 mg twice daily).

<table>
<thead>
<tr>
<th>Co-administered Drug by Therapeutic Area</th>
<th>Effects on drug levels</th>
<th>Clinical Recommendation Concerning Co-Administration with Kaletra</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antiretroviral Agents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nucleoside/Nucleotide reverse transcriptase inhibitors (NRTIs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stavudine, Lamivudine</td>
<td>Lopinavir: ↔</td>
<td>No dose adjustment necessary.</td>
</tr>
<tr>
<td>Abacavir, Zidovudine</td>
<td>Abacavir, Zidovudine:</td>
<td>The clinical significance of reduced abacavir and zidovudine concentrations is unknown.</td>
</tr>
<tr>
<td></td>
<td>Geometric Mean Change (% in AUC, C_{max}, C_{min})</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mechanism of Interaction</td>
<td></td>
</tr>
<tr>
<td>Tenofovir, 300 mg QD</td>
<td>Tenofovir:</td>
<td>No dose adjustment necessary. Higher tenofovir concentrations could potentiate tenofovir associated adverse events, including renal disorders.</td>
</tr>
<tr>
<td></td>
<td>AUC: ↑ 32%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C_{max} : ↔</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C_{min} : ↑ 51%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lopinavir: ↔</td>
<td></td>
</tr>
<tr>
<td>Non-nucleoside reverse transcriptase inhibitors (NNRTIs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Efavirenz, 600 mg QD</strong></td>
<td>Lopinavir:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AUC: ↓ 20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{max}}$: ↓ 13%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{min}}$: ↓ 42%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Kaletra tablets dosage should be increased to 500/125 mg twice daily when co-administered with efavirenz.</td>
<td></td>
</tr>
<tr>
<td><strong>Efavirenz, 600 mg QD</strong></td>
<td>Lopinavir: ↔</td>
<td></td>
</tr>
<tr>
<td>(Lopinavir/ritonavir 500/125 mg BID)</td>
<td>(Relative to 400/100 mg BID administered alone)</td>
<td></td>
</tr>
<tr>
<td><strong>Nevirapine, 200 mg BID</strong></td>
<td>Lopinavir:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AUC: ↓ 27%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{max}}$: ↓ 19%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{min}}$: ↓ 51%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Kaletra tablets dosage should be increased to 500/125 mg twice daily when co-administered with nevirapine.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Co-administration with other HIV protease inhibitors (PIs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>According to current treatment guidelines, dual therapy with protease inhibitors is generally not recommended.</td>
</tr>
<tr>
<td><strong>Fosamprenavir/ritonavir (700/100 mg BID)</strong></td>
</tr>
<tr>
<td>(Lopinavir/ritonavir 400/100 mg BID)</td>
</tr>
<tr>
<td>or</td>
</tr>
<tr>
<td><strong>Fosamprenavir (1400 mg BID)</strong></td>
</tr>
<tr>
<td><strong>Indinavir, 600 mg BID</strong></td>
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<td></td>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Nelfinavir</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Saquinavir 1000 mg BID</strong></td>
</tr>
<tr>
<td><strong>Tipranavir/ritonavir (500/100 mg BID)</strong></td>
</tr>
<tr>
<td></td>
</tr>
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<td></td>
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<tr>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Acid reducing agents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Omeprazole (40 mg QD)</strong></td>
</tr>
<tr>
<td>Lopinavir: ↔</td>
</tr>
<tr>
<td>Drug</td>
</tr>
<tr>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>Ranitidine (150 mg single dose)</td>
</tr>
<tr>
<td><strong>Analgesics</strong></td>
</tr>
<tr>
<td><strong>Antiarrhythmics</strong></td>
</tr>
<tr>
<td>Bepridil, Systemic Lidocaine, and Quinidine</td>
</tr>
<tr>
<td><strong>Antibiotics</strong></td>
</tr>
<tr>
<td><strong>Anticancer agents</strong></td>
</tr>
<tr>
<td>Warfarin</td>
</tr>
<tr>
<td><strong>Anticonvulsants</strong></td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Phenytoin</td>
</tr>
<tr>
<td>Carbamazepine and Phenobarbital</td>
</tr>
<tr>
<td>Trazodone single dose (Ritonavir, 200 mg BID)</td>
</tr>
<tr>
<td>Ketoconazole and Itraconazole</td>
</tr>
<tr>
<td>Voriconazole</td>
</tr>
</tbody>
</table>
### Antimycobacterials

| Rifabutin, 150 mg QD | Rifabutin (parent drug and active 25-O-desacetyl metabolite):  
| AUC: ↑ 5.7-fold  
| C\text{max}: ↑ 3.5-fold | On the basis of these data, a rifabutin dose reduction of 75% (i.e. 150 mg every other day or 3 times per week) is recommended when administered with Kaletra. Further reduction may be necessary. |

| Rifampicin | Lopinavir:  
| Large decreases in lopinavir concentrations may be observed due to CYP3A induction by rifampicin. | Co-administration of Kaletra with rifampicin is not recommended as the decrease in lopinavir concentrations may in turn significantly decrease the lopinavir therapeutic effect. A dose adjustment of Kaletra 400 mg/400 mg (i.e. Kaletra 400/100 mg + ritonavir 300 mg) twice daily has allowed compensating for the CYP 3A4 inducer effect of rifampicin. However, such a dose adjustment might be associated with ALT/AST elevations and with increase in gastrointestinal disorders. Therefore, this co-administration should be avoided unless judged strictly necessary. If this co-administration is judged unavoidable, increased dose of Kaletra at 400 mg/400 mg twice daily may be administered with rifampicin under close safety and therapeutic drug monitoring. The Kaletra dose should be titrated upward only after rifampicin has been initiated (see section 4.4). |

### Benzodiazepines

| Midazolam | Oral Midazolam:  
| AUC: ↑ 13-fold  
| Parenteral Midazolam:  
| AUC: ↑ 4-fold  
<p>| Due to CYP3A inhibition by Kaletra | Kaletra must not be co-administered with oral midazolam (see section 4.3), whereas caution should be used with co-administration of Kaletra and parenteral midazolam. If Kaletra is co-administered with parenteral midazolam, it should be done in an intensive care unit (ICU) or similar setting which ensures close clinical monitoring and appropriate medical management in case of respiratory depression and/or prolonged sedation. Dosage adjustment for midazolam should be considered especially if more than a single dose of midazolam |</p>
<table>
<thead>
<tr>
<th><strong>Calcium channel blockers</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Felodipine, Nifedipine, and Nicardipine</strong></td>
<td><strong>Clinical monitoring of therapeutic and adverse effects is recommended when these medicines are concomitantly administered with Kaletra.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Felodipine, Nifedipine, Nicardipine:</strong> Concentrations may be increased due to CYP3A inhibition by Kaletra.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Corticosteroids</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dexamethasone</strong></td>
<td><strong>Clinical monitoring of antiviral efficacy is recommended when these medicines are concomitantly administered with Kaletra.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Lopinavir:</strong> Concentrations may be decreased due to CYP3A induction by dexamethasone.</td>
</tr>
<tr>
<td><strong>Fluticasone propionate, 50 μg intranasal 4 times daily (100 mg ritonavir BID)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Fluticasone propionate:</strong> Plasma concentrations ↑ Cortisol levels ↓ 86%</td>
</tr>
<tr>
<td></td>
<td>Greater effects may be expected when fluticasone propionate is inhaled. Systemic corticosteroid effects including Cushing's syndrome and adrenal suppression have been reported in patients receiving ritonavir and inhaled or intranasally administered fluticasone propionate; this could also occur with other corticosteroids metabolised via the P450 3A pathway eg budesonide. Consequently, concomitant administration of Kaletra and these glucocorticoids is not recommended unless the potential benefit of treatment outweighs the risk of systemic corticosteroid effects (see section 4.4). A dose reduction of the glucocorticoid should be considered with close monitoring of local and systemic effects or a switch to a glucocorticoid, which is not a substrate for CYP3A4 (eg beclomethasone). Moreover, in case of withdrawal of glucocorticoids progressive dose reduction may have to be performed over a longer period.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Erectile Dysfunction, Phosphodiesterase(PDE5) inhibitors</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tadalafil</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Tadalafil:</strong> AUC: ↑ 2-fold Due to CYP3A inhibition by Kaletra.</td>
</tr>
<tr>
<td></td>
<td>Particular caution must be used when prescribing sildenafil or tadalafil in patients receiving Kaletra with increased monitoring for adverse events including</td>
</tr>
</tbody>
</table>
| **Sildenafil** | **Sildenafil:**  
| | AUC: ↑ 11-fold  
| | Due to CYP3A inhibition by Kaletra.  
| | hypotension, syncope, visual changes and prolonged erection (see section 4.4).  
| | When co-administered with Kaletra, sildenafil doses must not exceed 25 mg in 48 hours and tadalafil doses must not exceed 10 mg every 72 hours.  
| | Co-administration of Kaletra with sildenafil used for the treatment of pulmonary arterial hypertension is contra-indicated (see section 4.3).  
| **Vardenafil** | **Vardenafil:**  
| | AUC: ↑ 49-fold  
| | Due to CYP3A inhibition by Kaletra.  
| | The use of vardenafil with Kaletra is contra-indicated (see section 4.3).  
| **Herbal products** |  
| | **St John’s wort**  
| | (Hypericum perforatum)  
| | Lopinavir:  
| | Concentrations may be reduced due to induction of CYP3A by the herbal preparation St John’s wort.  
| | Herbal preparations containing St John’s wort must not be combined with lopinavir and ritonavir. If a patient is already taking St John’s wort, stop St John’s wort and if possible check viral levels. Lopinavir and ritonavir levels may increase on stopping St John’s wort. The dose of Kaletra may need adjusting. The inducing effect may persist for at least 2 weeks after cessation of treatment with St John’s wort (see section 4.3). Therefore, Kaletra can be started safely 2 weeks after cessation of St. John’s wort.  
| **Immunosuppressants** |  
| | Cyclosporin, Sirolimus (rapamycin), and Tacrolimus  
| | Concentrations may be increased due to CYP3A inhibition by Kaletra.  
| | More frequent therapeutic concentration monitoring is recommended until plasma levels of these products have been stabilised.  
| **Lipid lowering agents** |  
| | Lovastatin and Simvastatin  
| | Lovastatin, Simvastatin:  
| | Markedly increased plasma concentrations due to CYP3A inhibition by Kaletra.  
| | Since increased concentrations of HMG-CoA reductase inhibitors may cause myopathy, including rhabdomyolysis, the combination of these agents with Kaletra is contra-indicated (see section 4.3).  
| | Atorvastatin  
| | Atorvastatin:  
| | AUC: ↑ 5.9-fold  
| | Cmax: ↑ 4.7-fold  
| | Due to CYP3A inhibition by Kaletra.  
| | The combination of Kaletra with atorvastatin is not recommended. If the use of atorvastatin is considered strictly necessary, the lowest possible dose of atorvastatin should be administered with careful safety monitoring (see section 4.4).  

| Rosuvastatin, 20 mg QD | Rosuvastatin:  
AUC: ↑ 2-fold  
C\text{max}: ↑ 5-fold  
While rosuvastatin is poorly metabolised by CYP3A4, an increase of its plasma concentrations was observed. The mechanism of this interaction may result from inhibition of transport proteins. | Caution should be exercised and reduced doses should be considered when Kaletra is co-administered with rosuvastatin (see section 4.4). |
|———|———|———|
| Fluvastatin or Pravastatin | Fluvastatin, Pravastatin:  
No clinical relevant interaction expected.  
Pravastatin is not metabolised by CYP450.  
Fluvastatin is partially metabolised by CYP2C9. | If treatment with an HMG-CoA reductase inhibitor is indicated, fluvastatin or pravastatin is recommended. |
| **Opioids** | | |
| Buprenorphine, 16 mg QD | Buprenorphine: ↔ | No dose adjustment necessary. |
| Methadone | Methadone: ↓ | Monitoring plasma concentrations of methadone is recommended. |
| **Oral Contraceptives** | | |
| Ethinyl Oestradiol | Ethinyl Oestradiol: ↓ | In case of co-administration of Kaletra with contraceptives containing ethinyl oestradiol (whatever the contraceptive formulation e.g. oral or patch), additional methods of contraception must be used. |
| **Smoking cessation aids** | | |
| Bupropion | Bupropion and its active metabolite, hydroxybupropion:  
AUC and C\text{max} ↓ ~50%  
This effect may be due to induction of bupropion metabolism. | If the co-administration of lopinavir/ritonavir with bupropion is judged unavoidable, this should be done under close clinical monitoring for bupropion efficacy, without exceeding the recommended dosage, despite the observed induction. |
| **Other medicinal products** | | |
| Based on known metabolic profiles, clinically significant interactions are not expected between Kaletra and dapsone, trimethoprim/sulfamethoxazole, azithromycin or fluconazole. | | |

### 4.6 Pregnancy and lactation

There are no data from the use of Kaletra in pregnant women. Studies in animals have shown reproductive toxicity (see section 5.3). The potential risk for humans is unknown. Kaletra should not be used during pregnancy unless clearly necessary.

Studies in rats revealed that lopinavir is excreted in the milk. It is not known whether this medicinal product is excreted in human milk. HIV-infected women must not breast-feed their infants under any circumstances to avoid transmission of HIV.
4.7 Effects on ability to drive and use machines

No studies on the effects on the ability to drive and use machines have been performed. Patients should be informed that nausea has been reported during treatment with Kaletra (see section 4.8).

Kaletra oral solution contains approximately 42% v/v alcohol.

4.8 Undesirable effects

a. Summary of the safety profile

The safety of Kaletra has been investigated in over 2600 patients in Phase II-IV clinical trials, of which over 700 have received a dose of 800/200 mg (6 capsules or 4 tablets) once daily. Along with nucleoside reverse transcriptase inhibitors (NRTIs), in some studies, Kaletra was used in combination with efavirenz or nevirapine.

The most common adverse reactions related to Kaletra therapy during clinical trials were diarrhoea, nausea, vomiting, hypertriglyceridaemia and hypercholesterolemia. Diarrhoea, nausea and vomiting may occur at the beginning of the treatment while hypertriglyceridaemia and hypercholesterolemia may occur later. Treatment emergent adverse events led to premature study discontinuation for 7% of subjects from Phase II-IV studies.

It is important to note that cases of pancreatitis have been reported in patients receiving Kaletra, including those who developed hypertriglyceridaemia. Furthermore, rare increases in PR interval have been reported during Kaletra therapy (see section 4.4: sections pancreatitis and lipid elevations).

b. Tabulated list of adverse reactions

Adverse reactions from clinical trials and post-marketing experience in adult and paediatric patients:

The safety of Kaletra has been investigated in over 2600 patients in Phase II-IV clinical trials, of which over 700 have received a dose of 800/200 mg (6 capsules or 4 tablets) once daily. Along with NRTIs, in some studies, Kaletra was used in combination with efavirenz or nevirapine.

The following events have been identified as adverse reactions. The frequency category includes all reported events of moderate to severe intensity, regardless of the individual causality assessment. The adverse reactions are displayed by system organ class. Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness: very common (≥1/10), common (≥1/100 to < 1/10) and uncommon (≥1/1000 to < 1/100).

Events noted as having frequency “Not known” were identified via post-marketing surveillance.

<p>| Undesirable effects in clinical studies and post-marketing in adult patients |
|-------------------------------------------------|--------|----------------------------------|
| System organ class | Frequency | Adverse reaction |
| Infections and infestations | Very common | Upper respiratory tract infection |
| | Common | Lower respiratory tract infection, skin infections including cellulitis, folliculitis and furuncle |
| Blood and lymphatic system disorders | Common | Anaemia, leucopenia, neutropenia, lymphadenopathy |
| Immune system disorders | Common | Hypersensitivity including urticaria and angioedema |
| | Uncommon | Immune reconstitution syndrome |</p>
<table>
<thead>
<tr>
<th>Endocrine disorders</th>
<th>Uncommon</th>
<th>Hypogonadism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolism and nutrition disorders</td>
<td>Common</td>
<td>Blood glucose disorders including diabetes mellitus, hypertriglyceridaemia, hypercholesterolemia, weight decreased, decreased appetite</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Weight increased, increased appetite</td>
</tr>
<tr>
<td>Psychiatric disorders</td>
<td>Common</td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Abnormal dreams, libido decreased</td>
</tr>
<tr>
<td>Nervous system disorders</td>
<td>Common</td>
<td>Headache (including migraine), neuropathy (including peripheral neuropathy), dizziness, insomnia</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Cerebrovascular accident, convulsion, dysgeusia, ageusia, tremor</td>
</tr>
<tr>
<td>Eye disorders</td>
<td>Uncommon</td>
<td>Visual impairment</td>
</tr>
<tr>
<td>Ear and labyrinth disorders</td>
<td>Uncommon</td>
<td>Tinnitus, vertigo</td>
</tr>
<tr>
<td>Cardiac disorders</td>
<td>Uncommon</td>
<td>Atherosclerosis such as myocardial infarction, atrioventricular block, tricuspid valve incompetence</td>
</tr>
<tr>
<td>Vascular disorders</td>
<td>Common</td>
<td>Hypertension</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Deep vein thrombosis</td>
</tr>
<tr>
<td>Gastrointestinal disorders</td>
<td>Very common</td>
<td>Diarrhoea, nausea</td>
</tr>
<tr>
<td></td>
<td>Common</td>
<td>Pancreatitis, vomiting, gastroesophageal reflux disease, gastroenteritis and colitis, abdominal pain (upper and lower), abdominal distension, dyspepsia, haemorrhoids, flatulence</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Gastrointestinal haemorrhage including gastrointestinal ulcer, duodenitis, gastritis and rectal haemorrhage, stomatitis and oral ulcers, faecal incontinence, constipation, dry mouth</td>
</tr>
<tr>
<td>Hepatobiliary disorders</td>
<td>Common</td>
<td>Hepatitis including AST, ALT and GGT increases</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Hepatic steatosis, hepatomegaly, cholangitis, hyperbilirubinemia</td>
</tr>
<tr>
<td></td>
<td>Not known</td>
<td>Jaundice</td>
</tr>
<tr>
<td>Skin and subcutaneous tissue disorders</td>
<td>Common</td>
<td>Lipodystrophy acquired including facial wasting, rash including maculopapular rash, dermatitis/rash including eczema and seborrhoeic dermatitis, night sweats, pruritus</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Alopecia, capillaritis, vasculitis</td>
</tr>
<tr>
<td></td>
<td>Not known</td>
<td>Steven-Johnson syndrome, erythema multiforme</td>
</tr>
<tr>
<td>Musculoskeletal and connective tissue disorders</td>
<td>Common</td>
<td>Myalgia, musculoskeletal pain including arthralgia and back pain, muscle disorders such as weakness and spasms</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Rhabdomyolysis, osteonecrosis</td>
</tr>
</tbody>
</table>
Renal and urinary disorders  Uncommon  Creatinine clearance decreased, nephritis, haematuria
Reproductive system and breast disorders  Common  Erectile dysfunction, menstrual disorders - amenorrhoea, menorrhagia
General disorders and administration site conditions  Common  Fatigue including asthenia

1 See section 4.4: pancreatitis and lipids

c. Description of selected adverse reactions

Cushing’s syndrome has been reported in patients receiving ritonavir and inhaled or intranasally administered fluticasone propionate; this could also occur with other corticosteroids metabolised via the P450 3A pathway e.g. budesonide (see section 4.4 and 4.5).

Increased CPK, myalgia, myositis, and rarely, rhabdomyolysis have been reported with protease inhibitors, particularly in combination with nucleoside reverse transcriptase inhibitors.

Combination antiretroviral therapy has been associated with redistribution of body fat (lipodystrophy) in HIV patients including the loss of peripheral and facial subcutaneous fat, increased intra-abdominal and visceral fat, breast hypertrophy and dorsocervical fat accumulation (buffalo hump).

Combination antiretroviral therapy has been associated with metabolic abnormalities such as hypertriglyceridaemia, hypercholesterolaemia, insulin resistance, hyperglycaemia and hyperlactataemia (see section 4.4).

In HIV-infected patients with severe immune deficiency at the time of initiation of combination antiretroviral therapy (CART), an inflammatory reaction to asymptomatic or residual opportunistic infections may arise (see section 4.4).

Cases of osteonecrosis have been reported, particularly in patients with generally acknowledged risk factors, advanced HIV disease or long-term exposure to combination antiretroviral therapy (CART). The frequency of this is unknown (see section 4.4).

d. Paediatric populations

In children 2 years of age and older, the nature of the safety profile is similar to that seen in adults (see Table in section b).

4.9 Overdose

To date, there is limited human experience of acute overdose with Kaletra.

The adverse clinical signs observed in dogs included salivation, emesis and diarrhoea/abnormal stool. The signs of toxicity observed in mice, rats or dogs included decreased activity, ataxia, emaciation, dehydration and tremors.

There is no specific antidote for overdose with Kaletra. Treatment of overdose with Kaletra is to consist of general supportive measures including monitoring of vital signs and observation of the clinical status of the patient. If indicated, elimination of unabsorbed active substance is to be achieved by emesis or gastric lavage. Administration of activated charcoal may also be used to aid in removal of unabsorbed active substance. Since Kaletra is highly protein bound, dialysis is unlikely to be beneficial in significant removal of the active substance.
5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmaco-therapeutic group: protease inhibitor, ATC code: J05AE06

**Mechanism of action:** Lopinavir provides the antiviral activity of Kaletra. Lopinavir is an inhibitor of the HIV-1 and HIV-2 proteases. Inhibition of HIV protease prevents cleavage of the gag-pol polyprotein resulting in the production of immature, non-infectious virus.

**Effects on the electrocardiogram:** QTcF interval was evaluated in a randomised, placebo and active (moxifloxacin 400 mg once daily) controlled crossover study in 39 healthy adults, with 10 measurements over 12 hours on Day 3. The maximum mean (95% upper confidence bound) differences in QTcF from placebo were 3.6 (6.3) and 13.1(15.8) for 400/100 mg twice daily and supratherapeutic 800/200 mg twice daily LPV/r, respectively. The induced QRS interval prolongation from 6 ms to 9.5 ms with high dose lopinavir/ritonavir (800/200 mg twice daily) contributes to QT prolongation. The two regimens resulted in exposures on Day 3 which were approximately 1.5 and 3-fold higher than those observed with recommended once daily or twice daily LPV/r doses at steady state. No subject experienced an increase in QTcF of $\geq 60$ msec from baseline or a QTcF interval exceeding the potentially clinically relevant threshold of 500 msec.

Modest prolongation of the PR interval was also noted in subjects receiving lopinavir/ritonavir in the same study on Day 3. The mean changes from baseline in PR interval ranged from 11.6 ms to 24.4 ms in the 12 hour interval post dose. Maximum PR interval was 286 msec and no second or third degree heart block was observed (see section 4.4).

**Antiviral activity in vitro:** the *in vitro* antiviral activity of lopinavir against laboratory and clinical HIV strains was evaluated in acutely infected lymphoblastic cell lines and peripheral blood lymphocytes, respectively. In the absence of human serum, the mean IC$_{50}$ of lopinavir against five different HIV-1 laboratory strains was 19 nM. In the absence and presence of 50% human serum, the mean IC$_{50}$ of lopinavir against HIV-1IIIB in MT4 cells was 17 nM and 102 nM, respectively. In the absence of human serum, the mean IC$_{50}$ of lopinavir was 6.5 nM against several HIV-1 clinical isolates.

**Resistance**

**In vitro selection of resistance:**

HIV-1 isolates with reduced susceptibility to lopinavir have been selected *in vitro*. HIV-1 has been passaged *in vitro* with lopinavir alone and with lopinavir plus ritonavir at concentration ratios representing the range of plasma concentration ratios observed during Kaletra therapy. Genotypic and phenotypic analysis of viruses selected in these passages suggest that the presence of ritonavir, at these concentration ratios, does not measurably influence the selection of lopinavir-resistant viruses. Overall, the *in vitro* characterisation of phenotypic cross-resistance between lopinavir and other protease inhibitors suggest that decreased susceptibility to lopinavir correlated closely with decreased susceptibility to ritonavir and indinavir, but did not correlate closely with decreased susceptibility to amprenavir, saquinavir, and nelfinavir.

**Analysis of resistance in ARV-naïve patients:**

In clinical studies with a limited number of isolates analysed, the selection of resistance to lopinavir has not been observed in naïve patients without significant protease inhibitor resistance at baseline. See further the detailed description of the clinical studies.
Analysis of resistance in PI-experienced patients:

The selection of resistance to lopinavir in patients having failed prior protease inhibitor-therapy was characterised by analysing the longitudinal isolates from 19 protease inhibitor-experienced subjects in 2 Phase II and one Phase III studies who either experienced incomplete virologic suppression or viral rebound subsequent to initial response to Kaletra and who demonstrated incremental in vitro resistance between baseline and rebound (defined as emergence of new mutations or 2-fold change in phenotypic susceptibility to lopinavir). Incremental resistance was most common in subjects whose baseline isolates had several protease inhibitor-associated mutations, but < 40-fold reduced susceptibility to lopinavir at baseline. Mutations V82A, I54V and M46I emerged most frequently. Mutations L33F, I50V and V32I combined with I47V/A were also observed. The 19 isolates demonstrated a 4.3-fold increase in IC₅₀ compared to baseline isolates (from 6.2- to 43-fold, compared to wild-type virus).

Genotypic correlates of reduced phenotypic susceptibility to lopinavir in viruses selected by other protease inhibitors. The in vitro antiviral activity of lopinavir against 112 clinical isolates taken from patients failing therapy with one or more protease inhibitors was assessed. Within this panel, the following mutations in HIV protease were associated with reduced in vitro susceptibility to lopinavir: L10F/I/R/V, K20M/R, L24I, M46I/L, F53L, I54L/T/V, L63P, A71I/L/T/V, V82A/F/T, I84V and L90M. The median EC₅₀ of lopinavir against isolates with 0 – 3, 4 – 5, 6 – 7 and 8 – 10 mutations at the above amino acid positions was 0.8, 2.7 13.5 and 44.0-fold higher than the EC₅₀ against wild type HIV, respectively. The 16 viruses that displayed > 20-fold change in susceptibility all contained mutations at positions 10, 54, 63 plus 82 and/or 84. In addition, they contained a median of 3 mutations at amino acid positions 20, 24, 46, 53, 71 and 90. In addition to the mutations described above, mutations V32I and I47A have been observed in rebound isolates with reduced lopinavir susceptibility from protease inhibitor experienced patients receiving Kaletra therapy, and mutations I47A and L76V have been observed in rebound isolates with reduced lopinavir susceptibility from patients receiving Kaletra therapy.

Conclusions regarding the relevance of particular mutations or mutational patterns are subject to change with additional data, and it is recommended to always consult current interpretation systems for analysing resistance test results.

Antiviral activity of Kaletra in patients failing protease inhibitor therapy: the clinical relevance of reduced in vitro susceptibility to lopinavir has been examined by assessing the virologic response to Kaletra therapy, with respect to baseline viral genotype and phenotype, in 56 patients previous failing therapy with multiple protease inhibitors. The EC₅₀ of lopinavir against the 56 baseline viral isolates ranged from 0.6 to 96-fold higher than the EC₅₀ against wild type HIV. After 48 weeks of treatment with Kaletra, efavirenz and nucleoside reverse transcriptase inhibitors, plasma HIV RNA ≤ 400 copies/ml was observed in 93% (25/27), 73% (11/15), and 25% (2/8) of patients with < 10-fold, 10 to 40-fold, and > 40-fold reduced susceptibility to lopinavir at baseline, respectively. In addition, virologic response was observed in 91% (21/23), 71% (15/21) and 33% (2/6) patients with 0 – 5, 6 – 7, and 8 – 10 mutations of the above mutations in HIV protease associated with reduced in vitro susceptibility to lopinavir. Since these patients had not previously been exposed to either Kaletra or efavirenz, part of the response may be attributed to the antiviral activity of efavirenz, particularly in patients harbouring highly lopinavir resistant virus. The study did not contain a control arm of patients not receiving Kaletra.

Cross-resistance: Activity of other protease inhibitors against isolates that developed incremental resistance to lopinavir after Kaletra therapy in protease inhibitor experienced patients: The presence of cross resistance to other protease inhibitors was analysed in 18 rebound isolates that had demonstrated evolution of resistance to lopinavir during 3 Phase II and one Phase III studies of Kaletra in protease inhibitor-experienced patients. The median-fold IC₅₀ of lopinavir for these 18 isolates at baseline and rebound was 6.9- and 63-fold, respectively, compared to wild type virus. In general, rebound isolates either retained (if cross-resistant at baseline) or developed significant cross-resistance to indinavir, saquinavir and atazanavir. Modest decreases in amprenavir activity were noted with a median increase of IC₅₀ from 3.7- to 8-fold in the baseline and rebound isolates, respectively. Isolates retained susceptibility to tipranavir with a median increase of IC₅₀ in baseline and rebound isolates of 1.9- and
1.8–fold, respectively, compared to wild type virus. Please refer to the Aptivus Summary of Product Characteristics for additional information on the use of tipranavir, including genotypic predictors of response, in treatment of lopinavir-resistant HIV-1 infection.

Clinical results

The effects of Kaletra (in combination with other antiretroviral agents) on biological markers (plasma HIV RNA levels and CD4+ T-cell counts) have been investigated in a controlled studies of Kaletra of 48 to 360 weeks duration.

Adult Use

Patients without prior antiretroviral therapy

Study M98-863 was a randomised, double-blind trial of 653 antiretroviral treatment naïve patients investigating Kaletra (400/100 mg twice daily) compared to nelfinavir (750 mg three times daily) plus stavudine and lamivudine. Mean baseline CD4+ T-cell count was 259 cells/mm³ (range: 2 to 949 cells/mm³) and mean baseline plasma HIV-1 RNA was 4.9 log_{10} copies/ml (range: 2.6 to 6.8 log_{10} copies/ml).

Table 1

<table>
<thead>
<tr>
<th>Outcomes at Week 48: Study M98-863</th>
<th>Kaletra (N=326)</th>
<th>Nelfinavir (N=327)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml*</td>
<td>75%</td>
<td>63%</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml†</td>
<td>67%</td>
<td>52%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>207</td>
<td>195</td>
</tr>
</tbody>
</table>

* intent to treat analysis where patients with missing values are considered virologic failures
† p<0.001

One-hundred thirteen nelfinavir-treated patients and 74 lopinavir/ritonavir-treated patients had an HIV RNA above 400 copies/ml while on treatment from Week 24 through Week 96. Of these, isolates from 96 nelfinavir-treated patients and 51 lopinavir/ritonavir-treated patients could be amplified for resistance testing. Resistance to nelfinavir, defined as the presence of the D30N or L90M mutation in protease, was observed in 41/96 (43%) patients. Resistance to lopinavir, defined as the presence of any primary or active site mutations in protease (see above), was observed in 0/51 (0%) patients. Lack of resistance to lopinavir was confirmed by phenotypic analysis.

Sustained virological response to Kaletra (in combination with nucleoside/nucleotide reverse transcriptase inhibitors) has been also observed in a small Phase II study (M97-720) through 360 weeks of treatment. One hundred patients were originally treated with Kaletra in the study (including 51 patients receiving 400/100 mg twice daily and 49 patients at either 200/100 mg twice daily or 400/200 mg twice daily). All patients converted to open-label Kaletra at the 400/100 mg twice daily dose between week 48 and week 72. Thirty-nine patients (39%) discontinued the study, including 16 (16%) discontinuations due to adverse events, one of which was associated with a death. Sixty-one patients completed the study (35 patients received the recommended 400/100 mg twice daily dose throughout the study).
Table 2

<table>
<thead>
<tr>
<th>Outcomes at Week 360: Study M97-720</th>
<th>Kaletra (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml</td>
<td>61%</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml</td>
<td>59%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>501</td>
</tr>
</tbody>
</table>

Through 360 weeks of treatment, genotypic analysis of viral isolates was successfully conducted in 19 of 28 patients with confirmed HIV RNA above 400 copies/ml revealed no primary or active site mutations in protease (amino acids at positions 8, 30, 32, 46, 47, 48, 50, 82, 84 and 90) or protease inhibitor phenotypic resistance.

Patients with prior antiretroviral therapy

M97-765 is a randomised, double-blind trial evaluating Kaletra at two dose levels (400/100 mg and 400/200 mg, both twice daily) plus nevirapine (200 mg twice daily) and two nucleoside reverse transcriptase inhibitors in 70 single protease inhibitor experienced, non-nucleoside reverse transcriptase inhibitor naïve patients. Median baseline CD₄ cell count was 349 cells/mm³ (range 72 to 807 cells/mm³) and median baseline plasma HIV-1 RNA was 4.0 log₁₀ copies/ml (range 2.9 to 5.8 log₁₀ copies/ml).

Table 3

<table>
<thead>
<tr>
<th>Outcomes at Week 24: Study M97-765</th>
<th>Kaletra 400/100 mg (N=36)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml (ITT)*</td>
<td>75%</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml (ITT)*</td>
<td>58%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>174</td>
</tr>
</tbody>
</table>

* intent to treat analysis where patients with missing values are considered virologic failures

M98-957 is a randomised, open-label study evaluating Kaletra treatment at two dose levels (400/100 mg and 533/133 mg, both twice daily) plus efavirenz (600 mg once daily) and nucleoside reverse transcriptase inhibitors in 57 multiple protease inhibitor experienced, non-nucleoside reverse transcriptase inhibitor naïve patients. Between week 24 and 48, patients randomised to a dose of 400/100 mg were converted to a dose of 533/133 mg. Median baseline CD₄ cell count was 220 cells/mm³ (range 13 to 1030 cells/mm³).

Table 4

<table>
<thead>
<tr>
<th>Outcomes at Week 48: Study M98-957</th>
<th>Kaletra 400/100 mg (N=57)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml*</td>
<td>65%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>94</td>
</tr>
</tbody>
</table>

* intent to treat analysis where patients with missing values are considered virologic failures

Paediatric Use

M98-940 was an open-label study of a liquid formulation of Kaletra in 100 antiretroviral naïve (44%) and experienced (56%) paediatric patients. All patients were non-nucleoside reverse transcriptase inhibitor naïve. Patients were randomised to either 230 mg lopinavir/57.5 mg ritonavir per m² or 300 mg lopinavir/75 mg ritonavir per m². Naïve patients also received nucleoside reverse transcriptase
inhibitors. Experienced patients received nevirapine plus up to two nucleoside reverse transcriptase inhibitors. Safety, efficacy and pharmacokinetic profiles of the two dose regimens were assessed after 3 weeks of therapy in each patient. Subsequently, all patients were continued on the 300/75 mg per m² dose. Patients had a mean age of 5 years (range 6 months to 12 years) with 14 patients less than 2 years old and 6 patients one year or less. Mean baseline CD4+ T-cell count was 838 cells/mm² and mean baseline plasma HIV-1 RNA was 4.7 log_{10} copies/ml.

Table 5

<table>
<thead>
<tr>
<th>Outcomes at Week 48: Study M98-940</th>
<th>Antiretroviral Naïve (N=44)</th>
<th>Antiretroviral Experienced (N=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml</td>
<td>84%</td>
<td>75%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm²)</td>
<td>404</td>
<td>284</td>
</tr>
</tbody>
</table>

5.2 Pharmacokinetic properties

The pharmacokinetic properties of lopinavir co-administered with ritonavir have been evaluated in healthy adult volunteers and in HIV-infected patients; no substantial differences were observed between the two groups. Lopinavir is essentially completely metabolised by CYP3A. Ritonavir inhibits the metabolism of lopinavir, thereby increasing the plasma levels of lopinavir. Across studies, administration of Kaletra 400/100 mg twice daily yields mean steady-state lopinavir plasma concentrations 15 to 20-fold higher than those of ritonavir in HIV-infected patients. The plasma levels of ritonavir are less than 7% of those obtained after the ritonavir dose of 600 mg twice daily. The in vitro antiviral EC_{50} of lopinavir is approximately 10-fold lower than that of ritonavir. Therefore, the antiviral activity of Kaletra is due to lopinavir.

Absorption: multiple dosing with 400/100 mg Kaletra twice daily for 2 weeks and without meal restriction produced a mean ± SD lopinavir peak plasma concentration (C_{max}) of 12.3 ± 5.4 μg/ml, occurring approximately 4 hours after administration. The mean steady-state trough concentration prior to the morning dose was 8.1 ± 5.7 μg/ml. Lopinavir AUC over a 12 hour dosing interval averaged 113.2 ± 60.5 μg•h/ml. The absolute bioavailability of lopinavir co-formulated with ritonavir in humans has not been established.

Effects of food on oral absorption: Kaletra soft capsules and liquid have been shown to be bioequivalent under nonfasting conditions (moderate fat meal). Administration of a single 400/100 mg dose of Kaletra soft capsules with a moderate fat meal (500 – 682 kcal, 22.7 – 25.1% from fat) was associated with a mean increase of 48% and 23% in lopinavir AUC and C_{max}, respectively, relative to fasting. For Kaletra oral solution, the corresponding increases in lopinavir AUC and C_{max} were 80% and 54%, respectively. Administration of Kaletra with a high fat meal (872 kcal, 55.8% from fat) increased lopinavir AUC and C_{max} by 96% and 43%, respectively, for soft capsules, and 130% and 56%, respectively, for oral solution. To enhance bioavailability and minimise variability Kaletra is to be taken with food.

Distribution: at steady state, lopinavir is approximately 98 – 99% bound to serum proteins. Lopinavir binds to both alpha-1-acid glycoprotein (AAG) and albumin, however, it has a higher affinity for AAG. At steady state, lopinavir protein binding remains constant over the range of observed concentrations after 400/100 mg Kaletra twice daily, and is similar between healthy volunteers and HIV-positive patients.

Metabolism: in vitro experiments with human hepatic microsomes indicate that lopinavir primarily undergoes oxidative metabolism. Lopinavir is extensively metabolised by the hepatic cytochrome P450 system, almost exclusively by isozyme CYP3A. Ritonavir is a potent CYP3A inhibitor which inhibits the metabolism of lopinavir and therefore, increases plasma levels of lopinavir. A ^{14}C-lopinavir study in humans showed that 89% of the plasma radioactivity after a single 400/100 mg
Kaletra dose was due to parent active substance. At least 13 lopinavir oxidative metabolites have been identified in man. The 4-oxo and 4-hydroxymetabolite epimeric pair are the major metabolites with antiviral activity, but comprise only minute amounts of total plasma radioactivity. Ritonavir has been shown to induce metabolic enzymes, resulting in the induction of its own metabolism, and likely the induction of lopinavir metabolism. Pre-dose lopinavir concentrations decline with time during multiple dosing, stabilising after approximately 10 days to 2 weeks.

**Elimination**: after a 400/100 mg \(^{14}\)C-lopinavir/ritonavir dose, approximately 10.4 ± 2.3% and 82.6 ± 2.5% of an administered dose of \(^{14}\)C-lopinavir can be accounted for in urine and faeces, respectively. Unchanged lopinavir accounted for approximately 2.2% and 19.8% of the administered dose in urine and faeces, respectively. After multiple dosing, less than 3% of the lopinavir dose is excreted unchanged in the urine. The effective (peak to trough) half-life of lopinavir over a 12 hour dosing interval averaged 5 – 6 hours, and the apparent oral clearance (CL/F) of lopinavir is 6 to 7 l/h.

**Special Populations**

**Paediatrics:**

There are limited pharmacokinetic data in children below 2 years of age. The pharmacokinetics of Kaletra 300/75 mg/m\(^2\) twice daily and 230/57.5 mg/m\(^2\) twice daily have been studied in a total of 53 paediatric patients, ranging in age from 6 months to 12 years. The lopinavir mean steady-state AUC, C\(_{\text{max}}\), and C\(_{\text{min}}\) were 72.6 ± 31.1 \(\mu\)g•h/ml, 8.2 ± 2.9 \(\mu\)g/ml and 3.4 ± 2.1 \(\mu\)g/ml, respectively after Kaletra 230/57.5 mg/m\(^2\) twice daily without nevirapine (n=12), and were 85.8 ± 36.9 \(\mu\)g•h/ml, 10.0 ± 3.3 \(\mu\)g/ml and 3.6 ± 3.5 \(\mu\)g/ml, respectively after 300/75 mg/m\(^2\) twice daily with nevirapine (n=12). The 230/57.5 mg/m\(^2\) twice daily regimen without nevirapine and the 300/75 mg/m\(^2\) twice daily regimen with nevirapine provided lopinavir plasma concentrations similar to those obtained in adult patients receiving the 400/100 mg twice daily regimen without nevirapine. Kaletra soft capsules and Kaletra oral solution are bioequivalent under nonfasting conditions.

**Gender, Race and Age:**

Kaletra pharmacokinetics have not been studied in the elderly. No age or gender related pharmacokinetic differences have been observed in adult patients. Pharmacokinetic differences due to race have not been identified.

**Renal Insufficiency:**

Kaletra pharmacokinetics have not been studied in patients with renal insufficiency; however, since the renal clearance of lopinavir is negligible, a decrease in total body clearance is not expected in patients with renal insufficiency.

**Hepatic Insufficiency:**

The steady state pharmacokinetic parameters of lopinavir in HIV-infected patients with mild to moderate hepatic impairment were compared with those of HIV-infected patients with normal hepatic function in a multiple dose study with lopinavir/ritonavir 400/100 mg twice daily. A limited increase in total lopinavir concentrations of approximately 30% has been observed which is not expected to be of clinical relevance (see section 4.2).

### 5.3 Preclinical safety data

Repeat-dose toxicity studies in rodents and dogs identified major target organs as the liver, kidney, thyroid, spleen and circulating red blood cells. Hepatic changes indicated cellular swelling with focal degeneration. While exposure eliciting these changes were comparable to or below human clinical exposure, dosages in animals were over 6-fold the recommended clinical dose. Mild renal tubular degeneration was confined to mice exposed with at least twice the recommended human exposure; the kidney was unaffected in rats and dogs. Reduced serum thyroxin led to an increased release of TSH.
with resultant follicular cell hypertrophy in the thyroid glands of rats. These changes were reversible with withdrawal of the active substance and were absent in mice and dogs. Coombs-negative anisocytosis and poikilocytosis were observed in rats, but not in mice or dogs. Enlarged spleens with histiocytosis were seen in rats but not other species. Serum cholesterol was elevated in rodents but not dogs, while triglycerides were elevated only in mice.

During in vitro studies, cloned human cardiac potassium channels (HERG) were inhibited by 30% at the highest concentrations of lopinavir/ritonavir tested, corresponding to a lopinavir exposure 7-fold total and 15-fold free peak plasma levels achieved in humans at the maximum recommended therapeutic dose. In contrast, similar concentrations of lopinavir/ritonavir demonstrated no repolarisation delay in the canine cardiac Purkinje fibres. Lower concentrations of lopinavir/ritonavir did not produce significant potassium (HERG) current blockade. Tissue distribution studies conducted in the rat did not suggest significant cardiac retention of the active substance; 72-hour AUC in heart was approximately 50% of measured plasma AUC. Therefore, it is reasonable to expect that cardiac lopinavir levels would not be significantly higher than plasma levels.

In dogs, prominent U waves on the electrocardiogram have been observed associated with prolonged PR interval and bradycardia. These effects have been assumed to be caused by electrolyte disturbance.

The clinical relevance of these preclinical data is unknown, however, the potential cardiac effects of this product in humans cannot be ruled out (see also sections 4.4 and 4.8).

In rats, embryofoetotoxicity (pregnancy loss, decreased foetal viability, decreased foetal body weights, increased frequency of skeletal variations) and postnatal developmental toxicity (decreased survival of pups) was observed at maternally toxic dosages. The systemic exposure to lopinavir/ritonavir at the maternal and developmental toxic dosages was lower than the intended therapeutic exposure in humans.

Long-term carcinogenicity studies of lopinavir/ritonavir in mice revealed a nongenotoxic, mitogenic induction of liver tumours, generally considered to have little relevance to human risk. Carcinogenicity studies in rats revealed no tumourigenic findings. Lopinavir/ritonavir was not found to be mutagenic or clastogenic in a battery of in vitro and in vivo assays including the Ames bacterial reverse mutation assay, the mouse lymphoma assay, the mouse micronucleus test and chromosomal aberration assays in human lymphocytes.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Oral solution contains:
alcohol (42% v/v),
high fructose corn syrup,
propylene glycol,
purified water,
glycerol,
povidone,
magnasweet-110 flavour (mixture of monoammonium glycyrrhizinate and glycerol),
vanilla flavour (containing p-hydroxybenzoic acid, p-hydroxybenzaldehyde, vanillic acid, vanillin, heliotrope, ethyl vanillin),
polyoxyyl 40 hydrogenated castor oil,
cotton candy flavour (containing ethyl maltol, ethyl vanillin, aceton, dihydrocoumarin, propylene glycol),
acesulfame potassium,
saccharin sodium,
sodium chloride,
6.2 Incompatibilities

Not applicable.

6.3 Shelf life

2 years

6.4 Special precautions for storage

Store in a refrigerator (2°C - 8°C).
In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.
Avoid exposure to excessive heat.

6.5 Nature and content of container

Amber coloured multiple-dose polyethylene terephthalate (PET) bottles in a 60 ml size. Each pack contains 5 bottles of 60 ml (300 ml). The pack also contains 5 x 5 ml syringes with 0.1 ml graduations from 0 to 5 ml (400/100 mg).

6.6 Special precautions for disposal

No special requirements.

7. MARKETING AUTHORISATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

8. MARKETING AUTHORISATION NUMBER

EU/1/01/172/003

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 20 March 2001
Date of last renewal: 20 March 2006

10. DATE OF REVISION OF THE TEXT

{MM/YYYY}
1. NAME OF THE MEDICINAL PRODUCT

Kaletra 200 mg/50 mg film-coated tablets

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each film-coated tablet contains 200 mg of lopinavir co-formulated with 50 mg of ritonavir as a pharmacokinetic enhancer.

For a full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Film-coated tablet

Yellow embossed with [Abbott logo] and “KA”.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Kaletra is indicated for the treatment of HIV-1 infected adults and children above the age of 2 years, in combination with other antiretroviral agents.

Most experience with Kaletra is derived from the use of the product in antiretroviral therapy naïve patients.

The choice of Kaletra to treat protease inhibitor experienced HIV-1 infected patients should be based on individual viral resistance testing and treatment history of patients (see sections 4.4 and 5.1).

4.2 Posology and method of administration

Kaletra should be prescribed by physicians who are experienced in the treatment of HIV infection.

Kaletra tablets should be swallowed whole and not chewed, broken or crushed

Adult and adolescent use: the standard recommended dosage of Kaletra tablets is 400/100 mg (two 200/50 mg) tablets twice daily taken with or without food. In adult patients, in cases where once daily dosing is considered necessary for the management of the patient, Kaletra tablets may be administered as 800/200 mg (four 200/50 mg tablets) once daily with or without food. The use of a once daily dosing should be limited to those adult patients having only very few protease inhibitor (PI) associated mutations (i.e. less than 3 PI mutations in line with clinical trial results, see section 5.1 for the full description of the population) and should take into account the risk of a lesser sustainability of the virologic suppression (see section 5.1) and higher risk of diarrhoea (see section 4.8) compared to the recommended standard twice daily dosing. An oral solution is available to patients who have difficulty swallowing. Refer to the Summary of Product Characteristics for Kaletra oral solution for dosing instructions.

Paediatric use (2 years of age and above): the adult dose of Kaletra tablets (400/100 mg twice daily) may be used in children 40 kg or greater or with a Body Surface Area (BSA)* greater than 1.4 m². For children weighing less than 40 kg or with a BSA between 0.5 and 1.4 m² and able to swallow tablets, please refer to the Kaletra 100 mg/25 mg tablets Summary of Product Characteristics. For children unable to swallow tablets, please refer to the Kaletra oral solution Summary of Product Characteristics. Kaletra dosed once daily has not been evaluated in paediatric patients.
* Body surface area can be calculated with the following equation:

\[
BSA (m^2) = \sqrt{\frac{\text{Height (cm)} \times \text{Weight (kg)}}{3600}}
\]

Children less than 2 years of age: Kaletra is not recommended for use in children below 2 years of age due to insufficient data on safety and efficacy (see section 5.1).

**Concomitant Therapy: Efavirenz or nevirapine**

The following table contains dosing guidelines for Kaletra tablets based on BSA when used in combination with efavirenz or nevirapine in children.

<table>
<thead>
<tr>
<th>Body Surface Area (m²)</th>
<th>Recommended lopinavir/ritonavir dosing (mg) twice daily.</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 0.5 to &lt; 0.8</td>
<td>200/50 mg</td>
</tr>
<tr>
<td>≥ 0.8 to &lt; 1.2</td>
<td>300/75 mg</td>
</tr>
<tr>
<td>≥ 1.2 to &lt; 1.4</td>
<td>400/100 mg</td>
</tr>
<tr>
<td>≥ 1.4</td>
<td>500/125 mg</td>
</tr>
</tbody>
</table>

* Kaletra tablets must not be chewed, broken or crushed.

**Hepatic impairment:** In HIV-infected patients with mild to moderate hepatic impairment, an increase of approximately 30% in lopinavir exposure has been observed but is not expected to be of clinical relevance (see section 5.2). No data are available in patients with severe hepatic impairment. Kaletra should not be given to these patients (see section 4.3).

**Renal impairment:** since the renal clearance of lopinavir and ritonavir is negligible, increased plasma concentrations are not expected in patients with renal impairment. Because lopinavir and ritonavir are highly protein bound, it is unlikely that they will be significantly removed by haemodialysis or peritoneal dialysis.

### 4.3 Contraindications

Hypersensitivity to the active substances or to any of the excipients.

Patients with severe hepatic insufficiency.

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Kaletra should not be co-administered with medicinal products that are highly dependent on CYP3A for clearance and for which elevated plasma concentrations are associated with serious and/or life threatening events. These medicinal products include astemizole, terfenadine, oral midazolam (for caution on parenterally administered midazolam, see section 4.5), triazolam, cisapride, pimozide, amiodarone, ergot alkaloids (e.g. ergotamine, dihydroergotamine, ergonovine and methylergonovine) lovastatin, simvastatin, sildenafil used for the treatment of pulmonary arterial hypertension (for the use of sildenafil in patients with erectile dysfunction, see section 4.5) and vardenafil.

Herbal preparations containing St John’s wort (*Hypericum perforatum*) must not be used while taking lopinavir and ritonavir due to the risk of decreased plasma concentrations and reduced clinical effects of lopinavir and ritonavir (see section 4.5).
4.4 Special warnings and precautions for use

Patients with coexisting conditions

Hepatic impairment: the safety and efficacy of Kaletra has not been established in patients with significant underlying liver disorders. Kaletra is contraindicated in patients with severe liver impairment (see section 4.3). Patients with chronic hepatitis B or C and treated with combination antiretroviral therapy are at an increased risk for severe and potentially fatal hepatic adverse reactions. In case of concomitant antiviral therapy for hepatitis B or C, please refer to the relevant product information for these medicinal products.

Patients with pre-existing liver dysfunction including chronic hepatitis have an increased frequency of liver function abnormalities during combination antiretroviral therapy and should be monitored according to standard practice. If there is evidence of worsening liver disease in such patients, interruption or discontinuation of treatment should be considered.

Renal impairment: since the renal clearance of lopinavir and ritonavir is negligible, increased plasma concentrations are not expected in patients with renal impairment. Because lopinavir and ritonavir are highly protein bound, it is unlikely that they will be significantly removed by haemodialysis or peritoneal dialysis.

Haemophilia: there have been reports of increased bleeding, including spontaneous skin haematomas and haemarthrosis in patients with haemophilia type A and B treated with protease inhibitors. In some patients additional factor VIII was given. In more than half of the reported cases, treatment with protease inhibitors was continued or reintroduced if treatment had been discontinued. A causal relationship had been evoked, although the mechanism of action had not been elucidated. Haemophiliac patients should therefore be made aware of the possibility of increased bleeding.

Lipid elevations

Treatment with Kaletra has resulted in increases, sometimes marked, in the concentration of total cholesterol and triglycerides. Triglyceride and cholesterol testing is to be performed prior to initiating Kaletra therapy and at periodic intervals during therapy. Particular caution should be paid to patients with high values at baseline and with history of lipid disorders. Lipid disorders are to be managed as clinically appropriate (see also section 4.5 for additional information on potential interactions with HMG-CoA reductase inhibitors).

Pancreatitis

Cases of pancreatitis have been reported in patients receiving Kaletra, including those who developed hypertriglyceridaemia. In most of these cases patients have had a prior history of pancreatitis and/or concurrent therapy with other medicinal products associated with pancreatitis. Marked triglyceride elevation is a risk factor for development of pancreatitis. Patients with advanced HIV disease may be at risk of elevated triglycerides and pancreatitis.

Pancreatitis should be considered if clinical symptoms (nausea, vomiting, abdominal pain) or abnormalities in laboratory values (such as increased serum lipase or amylase values) suggestive of pancreatitis should occur. Patients who exhibit these signs or symptoms should be evaluated and Kaletra therapy should be suspended if a diagnosis of pancreatitis is made (see section 4.8).

Hyperglycaemia

New onset diabetes mellitus, hyperglycaemia or exacerbation of existing diabetes mellitus has been reported in patients receiving protease inhibitors. In some of these the hyperglycaemia was severe and in some cases also associated with ketoacidosis. Many patients had confounding medical conditions some of which required therapy with agents that have been associated with the development of diabetes mellitus or hyperglycaemia.
Fat redistribution and metabolic disorders

Combination antiretroviral therapy has been associated with redistribution of body fat (lipodystrophy) in HIV patients. The long-term consequences of these events are currently unknown. Knowledge about the mechanism is incomplete. A connection between visceral lipomatosis and protease inhibitors (PIs) and lipodystrophy and nucleoside reverse transcriptase inhibitors (NRTIs) has been hypothesised. A higher risk of lipodystrophy has been associated with individual factors such as older age, and with drug related factors such as longer duration of antiretroviral treatment and associated metabolic disturbances. Clinical examination should include evaluation for physical signs of fat redistribution. Consideration should be given to measurement of fasting serum lipids and blood glucose. Lipid disorders should be managed as clinically appropriate (see section 4.8).

Immune Reactivation Syndrome

In HIV-infected patients with severe immune deficiency at the time of institution of combination antiretroviral therapy (CART), an inflammatory reaction to asymptomatic or residual opportunistic pathogens may arise and cause serious clinical conditions, or aggravation of symptoms. Typically, such reactions have been observed within the first few weeks or months of initiation of CART. Relevant examples are cytomegalovirus retinitis, generalised and/or focal mycobacterial infections, and Pneumocystis jiroveci pneumonia. Any inflammatory symptoms should be evaluated and treatment instituted when necessary.

Osteonecrosis

Although the etiology is considered to be multifactorial (including corticosteroid use, alcohol consumption, severe immunosuppression, higher body mass index), cases of osteonecrosis have been reported particularly in patients with advanced HIV-disease and/or long-term exposure to combination antiretroviral therapy (CART). Patients should be advised to seek medical advice if they experience joint aches and pain, joint stiffness or difficulty in movement.

PR interval prolongation

Lopinavir/ritonavir has been shown to cause modest asymptomatic prolongation of the PR interval in some healthy adult subjects. Rare reports of 2nd or 3rd degree atroventricular block in patients with underlying structural heart disease and pre-existing conduction system abnormalities or in patients receiving drugs known to prolong the PR interval (such as verapamil or atazanavir) have been reported in patients receiving lopinavir/ritonavir. Kaletra should be used with caution in such patients (see section 5.1).

Interactions with medicinal products

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Kaletra is likely to increase plasma concentrations of medicinal products that are primarily metabolised by CYP3A. These increases of plasma concentrations of co-administered medicinal products could increase or prolong their therapeutic effect and adverse events (see sections 4.3 and 4.5).

The combination of Kaletra with atorvastatin is not recommended. If the use of atorvastatin is considered strictly necessary, the lowest possible dose of atorvastatin should be administered with careful safety monitoring. Caution must also be exercised and reduced doses should be considered if Kaletra is used concurrently with rosuvastatin. If treatment with a HMG-CoA reductase inhibitor is indicated, pravastatin or fluvastatin is recommended (see section 4.5).

PDE5 inhibitors: particular caution should be used when prescribing sildenafil or tadalafil for the treatment of erectile dysfunction in patients receiving Kaletra. Co-administration of Kaletra with these medicinal products is expected to substantially increase their concentrations and may result in associated adverse events such as hypotension, syncope, visual changes and prolonged erection (see
Concomitant use of vardenafil and lopinavir/ritonavir is contraindicated (see section 4.3). Concomitant use of sildenafil prescribed for the treatment of pulmonary arterial hypertension with Kaletra is contraindicated (see section 4.3).

Particular caution must be used when prescribing Kaletra and medicinal products known to induce QT interval prolongation such as: chlorpheniramine, quinidine, erythromycin, clarithromycin. Indeed, Kaletra could increase concentrations of the co-administered medicinal products and this may result in an increase of their associated cardiac adverse events. Cardiac events have been reported with Kaletra in preclinical studies; therefore, the potential cardiac effects of Kaletra cannot be currently ruled out (see sections 4.8 and 5.3).

Co-administration of Kaletra with rifampicin is not recommended. Rifampicin in combination with Kaletra causes large decreases in lopinavir concentrations which may in turn significantly decrease the lopinavir therapeutic effect. Adequate exposure to lopinavir/ritonavir may be achieved when a higher dose of Kaletra is used but this is associated with a higher risk of liver and gastrointestinal toxicity. Therefore, this co-administration should be avoided unless judged strictly necessary (see section 4.5).

Other

Kaletra is not a cure for HIV infection or AIDS. It does not reduce the risk of passing HIV to others through sexual contact or blood contamination. Appropriate precautions should be taken. People taking Kaletra may still develop infections or other illnesses associated with HIV disease and AIDS.

Concomitant use of Kaletra and fluticasone or other glucocorticoids that are metabolised by CYP3A4 is not recommended unless the potential benefit of treatment outweighs the risk of systemic corticosteroid effects, including Cushing’s syndrome and adrenal suppression (see section 4.5).

4.5 Interaction with other medicinal products and other forms of interaction

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A in vitro. Co-administration of Kaletra and medicinal products primarily metabolised by CYP3A may result in increased plasma concentrations of the other medicinal product, which could increase or prolong its therapeutic and adverse reactions. Kaletra does not inhibit CYP2D6, CYP2C9, CYP2C19, CYP2E1, CYP2B6 or CYP1A2 at clinically relevant concentrations (see section 4.3).

Kaletra has been shown in vivo to induce its own metabolism and to increase the biotransformation of some medicinal products metabolised by cytochrome P450 enzymes (including CYP2C9 and CYP2C19) and by glucuronidation. This may result in lowered plasma concentrations and potential decrease of efficacy of co-administered medicinal products.

Medicinal products that are contraindicated specifically due to the expected magnitude of interaction and potential for serious adverse events are listed in section 4.3.

All interaction studies, when otherwise not stated, were performed using Kaletra capsules, which gives an approximately 20% lower exposure of lopinavir than the 200/50 mg tablets.

Known and theoretical interactions with selected antiretrovirals and non-antiretroviral medicinal products are listed in the table below.

Interaction table

Interactions between Kaletra and co-administered medicinal products are listed in the table below (increase is indicated as “↑”, decrease as “↓”, no change as “→”, once daily as “QD”, twice daily as “BID” and three times daily as "TID").

Unless otherwise stated, studies detailed below have been performed with the recommended dosage of lopinavir/ritonavir (i.e. 400/100 mg twice daily).
<table>
<thead>
<tr>
<th>Co-administered Drug by Therapeutic Area</th>
<th>Effects on drug levels</th>
<th>Clinical Recommendation Concerning Co-Administration with Kaletra</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antiretroviral Agents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nucleoside/Nucleotide reverse transcriptase inhibitors (NRTIs)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stavudine, Lamivudine</td>
<td>Lopinavir: ↔</td>
<td>No dose adjustment necessary.</td>
</tr>
<tr>
<td>Abacavir, Zidovudine</td>
<td>Abacavir, Zidovudine: Concentrations may be reduced due to increased glucuronidation by Kaletra.</td>
<td>The clinical significance of reduced abacavir and zidovudine concentrations is unknown.</td>
</tr>
</tbody>
</table>
| Tenofovir, 300 mg QD                   | Tenofovir:  
AUC: ↑ 32%  
C\text{max} : ↔  
C\text{min} : ↑ 51%  
Lopinavir: ↔ | No dose adjustment necessary.  
Higher tenofovir concentrations could potentiate tenofovir associated adverse events, including renal disorders. |
| **Non-nucleoside reverse transcriptase inhibitors (NNRTIs)** | | |
| Efavirenz, 600 mg QD                   | Lopinavir:  
AUC: ↓ 20%  
C\text{max} : ↓ 13%  
C\text{min} : ↓ 42%  
Lopinavir: ↔ | The Kaletra tablets dosage should be increased to 500/125 mg twice daily when co-administered with efavirenz. |
| Efavirenz, 600 mg QD (Lopinavir/ritonavir 500/125 mg BID) | Lopinavir: ↔ (Relative to 400/100 mg BID administered alone) | Kaletra must not be administered once daily in combination with efavirenz. |
| Nevirapine, 200 mg BID                 | Lopinavir:  
AUC: ↓ 27%  
C\text{max} : ↓ 19%  
C\text{min} : ↓ 51%  
Lopinavir: ↔ | The Kaletra tablets dosage should be increased to 500/125 mg twice daily when co-administered with nevirapine.  
Kaletra must not be administered once daily in combination with nevirapine. |
<p>| <strong>Co-administration with other HIV protease inhibitors (PIs)</strong> | | |
| According to current treatment guidelines, dual therapy with protease inhibitors is generally not recommended. | | |
| Fosamprenavir/ritonavir (700/100 mg BID) (Lopinavir/ritonavir 400/100 mg BID) or Fosamprenavir (1400 mg BID) (Lopinavir/ritonavir 533/133 mg BID) | Fosamprenavir: Amprenavir concentrations are significantly reduced. | Co-administration of increased doses of fosamprenavir (1400 mg BID) with lopinavir/ritonavir (533/133 mg BID) to protease inhibitor-experienced patients resulted in a higher incidence of gastrointestinal adverse events and elevations in triglycerides with the combination regimen without increases in virological efficacy, when compared with standard doses of fosamprenavir/ritonavir. Concomitant administration of these medicinal products is not recommended. Kaletra must not be administered. |</p>
<table>
<thead>
<tr>
<th>Drug Combination</th>
<th>Kaletra Effect</th>
<th>Other Drug Effect</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indinavir, 600 mg BID</td>
<td>Indinavir:</td>
<td>Lopinavir:</td>
<td>The appropriate doses for this combination, with respect to efficacy and safety, have not been established.</td>
</tr>
<tr>
<td></td>
<td>AUC: ↔</td>
<td>Concentrations ↓</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{min}}$: ↑ 3.5-fold</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{max}}$: ↓ (relative to indinavir 800 mg TID alone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nelfinavir</td>
<td></td>
<td>Lopinavir:</td>
<td>The appropriate doses for this combination, with respect to efficacy and safety, have not been established. Kaletra must not be administered once daily in combination with nelfinavir.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concentrations ↓</td>
<td></td>
</tr>
<tr>
<td>Saquinavir 1000 mg BID</td>
<td>Saquinavir: ↔</td>
<td>No dose adjustment necessary.</td>
<td></td>
</tr>
<tr>
<td>Tipranavir/ritonavir (500/100 mg BID)</td>
<td>Lopinavir:</td>
<td>Lopinavir:</td>
<td>Concomitant administration of these medicinal products is not recommended.</td>
</tr>
<tr>
<td></td>
<td>AUC: ↓ 55%</td>
<td>AUC: ↔</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{min}}$: ↓ 47%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{max}}$: ↓ 70%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acid reducing agents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Omeprazole (40 mg QD)</td>
<td>Omeprazole: ↔</td>
<td>No dose adjustment necessary</td>
<td></td>
</tr>
<tr>
<td>Ranitidine (150 mg single dose)</td>
<td>Ranitidine: ↔</td>
<td>No dose adjustment necessary</td>
<td></td>
</tr>
<tr>
<td>Analgesics</td>
<td>Fentanyl:</td>
<td>Careful monitoring of adverse effects (notably respiratory depression but also sedation) is recommended when fentanyl is concomitantly administered with Kaletra.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increased risk of side-effects (respiratory depression, sedation) due to higher plasma concentrations because of CYP3A4 inhibition by Kaletra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antiarrhythmics</td>
<td>Digoxin:</td>
<td>Caution is warranted and therapeutic drug monitoring of digoxin concentrations, if available, is recommended in case of co-administration of Kaletra and digoxin. Particular caution should be used when prescribing Kaletra in patients taking digoxin as the acute inhibitory effect of ritonavir on Pgp is expected to significantly increase digoxin levels. Initiation of digoxin in patients already taking Kaletra is likely to result in lower than expected increases of digoxin concentrations.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plasma concentrations may be increased due to P-glycoprotein inhibition by Kaletra. The increased digoxin level may lessen over time as Pgp induction develops.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug Class</td>
<td>Drug Name</td>
<td>Interaction</td>
<td>Recommended Action</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------</td>
<td>----------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>Clarithromycin</td>
<td>Moderate increases in clarithromycin AUC are expected due to CYP3A inhibition by Kaletra.</td>
<td>For patients with renal impairment (CrCL &lt;30 ml/min) dose reduction of clarithromycin should be considered (see section 4.4). Caution should be exercised in administering clarithromycin with Kaletra to patients with impaired hepatic or renal function.</td>
</tr>
<tr>
<td>Anticancer agents</td>
<td>Most tyrosine kinase inhibitors such as dasatinib and nilotinib, Vincristine, Vinblastine</td>
<td>Risk of increased adverse events due to higher serum concentrations because of CYP3A4 inhibition by Kaletra.</td>
<td>Careful monitoring of the tolerance of these anticancer agents.</td>
</tr>
<tr>
<td>Anticoagulants</td>
<td>Warfarin</td>
<td>Concentrations may be affected when co-administered with Kaletra due to CYP2C9 induction.</td>
<td>It is recommended that INR (international normalised ratio) be monitored.</td>
</tr>
<tr>
<td>Anticonvulsants</td>
<td>Phenytoin</td>
<td>Steady-state concentrations were moderately decreased due to CYP2C9 and CYP2C19 induction by Kaletra.</td>
<td>Caution should be exercised in administering phenytoin with Kaletra. Phenytoin levels should be monitored when co-administering with lopinavir/ritonavir. When co-administered with phenytoin, an increase of Kaletra dosage may be envisaged. Dose adjustment has not been evaluated in clinical practice. Kaletra must not be administered once daily in combination with phenytoin.</td>
</tr>
<tr>
<td></td>
<td>Carbamazepine and Phenobarbital</td>
<td>Serum concentrations may be increased due to CYP3A inhibition by Kaletra.</td>
<td>Caution should be exercised in administering carbamazepine or phenobarbital with Kaletra. Carbamazepine and phenobarbital levels should be monitored when co-administering with lopinavir/ritonavir. When co-administered with carbamazepine or phenobarbital, an increase of Kaletra dosage may be envisaged. Dose adjustment has not been evaluated in clinical practice.</td>
</tr>
</tbody>
</table>
practice. Kaletra must not be administered once daily in combination with carbamazepine and phenobarbital.

**Antidepressants and Anxiolytics**

<table>
<thead>
<tr>
<th>Trazodone single dose (Ritonavir, 200 mg BID)</th>
<th>Trazodone: AUC: ↑ 2.4-fold</th>
<th>It is unknown whether the combination of lopinavir/ritonavir causes a similar increase in trazodone exposure. The combination should be used with caution and a lower dose of trazodone should be considered.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adverse events of nausea, dizziness, hypotension and syncope were observed following co-administration of trazodone and ritonavir.</td>
<td></td>
</tr>
</tbody>
</table>

**Antifungals**

<table>
<thead>
<tr>
<th>Ketoconazole and Itraconazole</th>
<th>Ketoconazole, Itraconazole: Serum concentrations may be increased due to CYP3A inhibition by Kaletra.</th>
<th>High doses of ketoconazole and itraconazole (&gt; 200 mg/day) are not recommended.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

**Antimycobacterials**

<table>
<thead>
<tr>
<th>Rifabutin, 150 mg QD</th>
<th>Rifabutin (parent drug and active 25-O-desacetyl metabolite): AUC: ↑ 5.7-fold Cmax: ↑ 3.5-fold</th>
<th>On the basis of these data, a rifabutin dose reduction of 75% (i.e. 150 mg every other day or 3 times per week) is recommended when administered with Kaletra. Further reduction may be necessary.</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Rifampicin</th>
<th>Lopinavir: Large decreases in lopinavir concentrations may be observed due to CYP3A induction by rifampicin.</th>
<th>Co-administration of Kaletra with rifampicin is not recommended as the decrease in lopinavir concentrations may in turn significantly decrease the lopinavir therapeutic effect. A dose adjustment of Kaletra 400 mg/400 mg (i.e. Kaletra 400/100 mg + ritonavir 300 mg) twice daily has allowed compensating for the CYP 3A4 inducer effect of rifampicin. However, such a dose adjustment might be associated with ALT/AST elevations and with increase in gastrointestinal disorders. Therefore, this co-administration should be avoided unless judged strictly necessary. If this co-administration is judged unavoidable, increased dose of Kaletra at 400 mg/400 mg twice daily may be administered with</th>
</tr>
</thead>
</table>
rifampicin under close safety and therapeutic drug monitoring. The Kaletra dose should be titrated upward only after rifampicin has been initiated (see section 4.4).

**Benzodiazepines**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Oral Midazolam: AUC: ↑ 13-fold</th>
<th>Parenteral Midazolam: AUC: ↑ 4-fold</th>
<th>Due to CYP3A inhibition by Kaletra</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midazolam</td>
<td>Kaletra must not be co-administered with oral midazolam (see section 4.3), whereas caution should be used with co-administration of Kaletra and parenteral midazolam. If Kaletra is co-administered with parenteral midazolam, it should be done in an intensive care unit (ICU) or similar setting which ensures close clinical monitoring and appropriate medical management in case of respiratory depression and/or prolonged sedation. Dosage adjustment for midazolam should be considered especially if more than a single dose of midazolam is administered.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Calcium channel blockers**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Felodipine, Nifedipine, Nicardipine: Concentrations may be increased due to CYP3A inhibition by Kaletra.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felodipine, Nifedipine, Nicardipine</td>
<td>Clinical monitoring of therapeutic and adverse effects is recommended when these medicines are concomitantly administered with Kaletra.</td>
</tr>
</tbody>
</table>

**Corticosteroids**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Lopinavir: Concentrations may be decreased due to CYP3A induction by dexamethasone.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexamethasone</td>
<td>Clinical monitoring of antiviral efficacy is recommended when these medicines are concomitantly administered with Kaletra.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Drug</th>
<th>Fluticasone propionate: Plasma concentrations ↑ Cortisol levels ↓ 86%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluticasone propionate, 50 μg intranasal 4 times daily (100 mg ritonavir BID)</td>
<td>Greater effects may be expected when fluticasone propionate is inhaled. Systemic corticosteroid effects including Cushing's syndrome and adrenal suppression have been reported in patients receiving ritonavir and inhaled or intranasally administered fluticasone propionate; this could also occur with other corticosteroids metabolised via the P450 3A pathway eg budesonide. Consequently, concomitant administration of Kaletra and these glucocorticoids is not recommended unless the potential benefit of treatment outweighs the risk of systemic corticosteroid effects (see section 4.4). A dose</td>
</tr>
</tbody>
</table>
reduction of the glucocorticoid should be considered with close monitoring of local and systemic effects or a switch to a glucocorticoid, which is not a substrate for CYP3A4 (e.g. beclomethasone). Moreover, in case of withdrawal of glucocorticoids progressive dose reduction may have to be performed over a longer period.

<table>
<thead>
<tr>
<th>Erectile Dysfunction, Phosphodiesterase(PDE5) inhibitors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tadalafil</strong></td>
</tr>
<tr>
<td>Tadalafil: AUC: ↑ 2-fold Due to CYP3A inhibition by Kaletra.</td>
</tr>
<tr>
<td>Particular caution must be used when prescribing sildenafil or tadalafil in patients receiving Kaletra with increased monitoring for adverse events including hypotension, syncope, visual changes and prolonged erection (see section 4.4). When co-administered with Kaletra, sildenafil doses must not exceed 25 mg in 48 hours and tadalafil doses must not exceed 10 mg every 72 hours. Co-administration of Kaletra with sildenafil used for the treatment of pulmonary arterial hypertension is contra-indicated (see section 4.3).</td>
</tr>
</tbody>
</table>

| **Sildenafil**                                           |
| Sildenafil: AUC: ↑ 11-fold Due to CYP3A inhibition by Kaletra. |
| The use of vardenafil with Kaletra is contra-indicated (see section 4.3). |

| **Vardenafil**                                          |
| Vardenafil: AUC: ↑ 49-fold Due to CYP3A inhibition by Kaletra. |

<table>
<thead>
<tr>
<th>Herbal products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>St John’s wort (Hypericum perforatum)</strong></td>
</tr>
<tr>
<td>Lopinavir: Concentrations may be reduced due to induction of CYP3A by the herbal preparation St John’s wort.</td>
</tr>
<tr>
<td>Herbal preparations containing St John’s wort must not be combined with lopinavir and ritonavir. If a patient is already taking St John’s wort, stop St John’s wort and if possible check viral levels. Lopinavir and ritonavir levels may increase on stopping St John’s wort. The dose of Kaletra may need adjusting. The inducing effect may persist for at least 2 weeks after cessation of treatment with St John’s wort (see section 4.3). Therefore, Kaletra can be started safely 2 weeks after cessation of St. John’s wort.</td>
</tr>
<tr>
<td><strong>Immunosuppressants</strong></td>
</tr>
<tr>
<td>------------------------</td>
</tr>
<tr>
<td>Cyclosporin, Sirolimus (rapamycin), and Tacrolimus</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Lipid lowering agents</strong></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Lovastatin and Simvastatin</td>
<td>Lovastatin, Simvastatin: Markedly increased plasma concentrations due to CYP3A inhibition by Kaletra.</td>
<td>Since increased concentrations of HMG-CoA reductase inhibitors may cause myopathy, including rhabdomyolysis, the combination of these agents with Kaletra is contraindicated (see section 4.3).</td>
</tr>
<tr>
<td>Atorvastatin</td>
<td>Atorvastatin: AUC: ↑ 5.9-fold C&lt;sub&gt;max&lt;/sub&gt;: ↑ 4.7-fold Due to CYP3A inhibition by Kaletra.</td>
<td>The combination of Kaletra with atorvastatin is not recommended. If the use of atorvastatin is considered strictly necessary, the lowest possible dose of atorvastatin should be administered with careful safety monitoring (see section 4.4).</td>
</tr>
<tr>
<td>Rosuvastatin, 20 mg QD</td>
<td>Rosuvastatin: AUC: ↑ 2-fold C&lt;sub&gt;max&lt;/sub&gt;: ↑ 5-fold While rosuvastatin is poorly metabolised by CYP3A4, an increase of its plasma concentrations was observed. The mechanism of this interaction may result from inhibition of transport proteins.</td>
<td>Caution should be exercised and reduced doses should be considered when Kaletra is co-administered with rosuvastatin (see section 4.4).</td>
</tr>
<tr>
<td>Fluvastatin or Pravastatin</td>
<td>Fluvastatin, Pravastatin: No clinical relevant interaction expected. Pravastatin is not metabolised by CYP450. Fluvastatin is partially metabolised by CYP2C9.</td>
<td>If treatment with an HMG-CoA reductase inhibitor is indicated, fluvastatin or pravastatin is recommended.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Opioids</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Buprenorphine, 16 mg QD</td>
<td>Buprenorphine: ↔</td>
<td>No dose adjustment necessary.</td>
</tr>
<tr>
<td>Methadone</td>
<td>Methadone: ↓</td>
<td>Monitoring plasma concentrations of methadone is recommended.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Oral Contraceptives</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethinyl Oestradiol</td>
<td>Ethinyl Oestradiol: ↓</td>
<td>In case of co-administration of Kaletra with contraceptives containing ethinyl oestradiol (whatever the contraceptive formulation e.g. oral or patch), additional methods of contraception must be used.</td>
</tr>
</tbody>
</table>
Smoking cessation aids

| Bupropion | Bupropion and its active metabolite, hydroxybupropion: AUC and $C_{max}$ ↓~50% | If the co-administration of lopinavir/ritonavir with bupropion is judged unavoidable, this should be done under close clinical monitoring for bupropion efficacy, without exceeding the recommended dosage, despite the observed induction. |

Other medicinal products

Based on known metabolic profiles, clinically significant interactions are not expected between Kaletra and dapsone, trimethoprim/sulfamethoxazole, azithromycin or fluconazole.

4.6 Pregnancy and lactation

There are no data from the use of Kaletra in pregnant women. Studies in animals have shown reproductive toxicity (see section 5.3). The potential risk for humans is unknown. Kaletra should not be used during pregnancy unless clearly necessary.

Studies in rats revealed that lopinavir is excreted in the milk. It is not known whether this medicinal product is excreted in human milk. HIV infected women must not breast-feed their infants under any circumstances to avoid transmission of HIV.

4.7 Effects on ability to drive and use machines

No studies on the effects on the ability to drive and use machines have been performed. Patients should be informed that nausea has been reported during treatment with Kaletra (see section 4.8).

4.8 Undesirable effects

a. Summary of the safety profile

The safety of Kaletra has been investigated in over 2600 patients in Phase II-IV clinical trials, of which over 700 have received a dose of 800/200 mg (6 capsules or 4 tablets) once daily. Along with nucleoside reverse transcriptase inhibitors (NRTIs), in some studies, Kaletra was used in combination with efavirenz or nevirapine.

The most common adverse reactions related to Kaletra therapy during clinical trials were diarrhoea, nausea, vomiting, hypertriglyceridaemia and hypercholesterolemia. The risk of diarrhoea may be greater with once daily dosing of Kaletra. Diarrhoea, nausea and vomiting may occur at the beginning of the treatment while hypertriglyceridaemia and hypercholesterolemia may occur later. Treatment emergent adverse events led to premature study discontinuation for 7% of subjects from Phase II-IV studies.

It is important to note that cases of pancreatitis have been reported in patients receiving Kaletra, including those who developed hypertriglyceridaemia. Furthermore, rare increases in PR interval have been reported during Kaletra therapy (see section 4.4: sections pancreatitis and lipid elevations).

b. Tabulated list of adverse reactions

Adverse reactions from clinical trials and post-marketing experience in adult and paediatric patients:

The safety of Kaletra has been investigated in over 2600 patients in Phase II-IV clinical trials, of which over 700 have received a dose of 800/200 mg (6 capsules or 4 tablets) once daily. Along with NRTIs, in some studies, Kaletra was used in combination with efavirenz or nevirapine.
The following events have been identified as adverse reactions. The frequency category includes all reported events of moderate to severe intensity, regardless of the individual causality assessment. The adverse reactions are displayed by system organ class. Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness: very common (≥ 1/10), common (≥ 1/100 to < 1/10) and uncommon (≥ 1/1000 to < 1/100).

Events noted as having frequency “Not known” were identified via post-marketing surveillance.

<table>
<thead>
<tr>
<th>System organ class</th>
<th>Frequency</th>
<th>Adverse reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections and infestations</td>
<td>Very common</td>
<td>Upper respiratory tract infection</td>
</tr>
<tr>
<td></td>
<td>Common</td>
<td>Lower respiratory tract infection, skin infections including cellulitis, folliculitis and furuncle</td>
</tr>
<tr>
<td>Blood and lymphatic system disorders</td>
<td>Common</td>
<td>Anaemia, leucopenia, neutropenia, lymphadenopathy</td>
</tr>
<tr>
<td>Immune system disorders</td>
<td>Common</td>
<td>Hypersensitivity including urticaria and angioedema</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Immune reconstitution syndrome</td>
</tr>
<tr>
<td>Endocrine disorders</td>
<td>Uncommon</td>
<td>Hypogonadism</td>
</tr>
<tr>
<td>Metabolism and nutrition disorders</td>
<td>Common</td>
<td>Blood glucose disorders including diabetes mellitus, hypertriglyceridaemia, hypercholesterolemia, weight decreased, decreased appetite</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Weight increased, increased appetite</td>
</tr>
<tr>
<td>Psychiatric disorders</td>
<td>Common</td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Abnormal dreams, libido decreased</td>
</tr>
<tr>
<td>Nervous system disorders</td>
<td>Common</td>
<td>Headache (including migraine), neuropathy (including peripheral neuropathy), dizziness, insomnia</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Cerebrovascular accident, convulsion, dysgeusia, ageusia, tremor</td>
</tr>
<tr>
<td>Eye disorders</td>
<td>Uncommon</td>
<td>Visual impairment</td>
</tr>
<tr>
<td>Ear and labyrinth disorders</td>
<td>Uncommon</td>
<td>Tinnitus, vertigo</td>
</tr>
<tr>
<td>Cardiac disorders</td>
<td>Uncommon</td>
<td>Atherosclerosis such as myocardial infarction, atrioventricular block, tricuspid valve incompetence</td>
</tr>
<tr>
<td>Vascular disorders</td>
<td>Common</td>
<td>Hypertension</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Deep vein thrombosis</td>
</tr>
<tr>
<td>Gastrointestinal disorders</td>
<td>Very common</td>
<td>Diarrhoea, nausea</td>
</tr>
<tr>
<td></td>
<td>Common</td>
<td>Pancreatitis 1, vomiting, gastroesophageal reflux disease, gastroenteritis and colitis, abdominal pain (upper and lower), abdominal distension, dyspepsia, haemorrhoids, flatulence</td>
</tr>
</tbody>
</table>
Uncommon Gastrointestinal haemorrhage including gastrointestinal ulcer, duodenitis, gastritis and rectal haemorrhage, stomatitis and oral ulcers, faecal incontinence, constipation, dry mouth

Hepatobiliary disorders

Common
Hepatitis including AST, ALT and GGT increases

Uncommon
Hepatic steatosis, hepatomegaly, cholangitis, hyperbilirubinemia

Not known
Jaundice

Skin and subcutaneous tissue disorders

Common
Lipodystrophy acquired including facial wasting, rash including maculopapular rash, dermatitis/rash including eczema and seborrheic dermatitis, night sweats, pruritis

Uncommon
Alopecia, capillaritis, vasculitis

Not known
Stevens-Johnson syndrome, erythema multiforme

Musculoskeletal and connective tissue disorders

Common
Myalgia, musculoskeletal pain including arthralgia and back pain, muscle disorders such as weakness and spasms

Uncommon
Rhabdomyolysis, osteonecrosis

Renal and urinary disorders

Uncommon
Creatinine clearance decreased, nephritis, haematuria

Reproductive system and breast disorders

Common
Erectile dysfunction, menstrual disorders - amenorrhoea, menorrhagia

General disorders and administration site conditions

Common
Fatigue including asthenia

1 See section 4.4: pancreatitis and lipids

c. Description of selected adverse reactions

Cushing’s syndrome has been reported in patients receiving ritonavir and inhaled or intranasally administered fluticasone propionate; this could also occur with other corticosteroids metabolised via the P450 3A pathway e.g. budesonide (see section 4.4 and 4.5).

Increased CPK, myalgia, myositis, and rarely, rhabdomyolysis have been reported with protease inhibitors, particularly in combination with nucleoside reverse transcriptase inhibitors.

Combination antiretroviral therapy has been associated with redistribution of body fat (lipodystrophy) in HIV patients including the loss of peripheral and facial subcutaneous fat, increased intra-abdominal and visceral fat, breast hypertrophy and dorsocervical fat accumulation (buffalo hump).

Combination antiretroviral therapy has been associated with metabolic abnormalities such as hypertriglyceridaemia, hypercholesterolaemia, insulin resistance, hyperglycaemia and hyperlactataemia (see section 4.4).

In HIV-infected patients with severe immune deficiency at the time of initiation of combination antiretroviral therapy (CART), an inflammatory reaction to asymptomatic or residual opportunistic infections may arise (see section 4.4).

Cases of osteonecrosis have been reported, particularly in patients with generally acknowledged risk factors, advanced HIV disease or long-term exposure to combination antiretroviral therapy (CART). The frequency of this is unknown (see section 4.4).
d. Paediatric populations

In children 2 years of age and older, the nature of the safety profile is similar to that seen in adults (see Table in section b).

4.9 Overdose

To date, there is limited human experience of acute overdose with Kaletra.

The adverse clinical signs observed in dogs included salivation, emesis and diarrhoea/abnormal stool. The signs of toxicity observed in mice, rats or dogs included decreased activity, ataxia, emaciation, dehydration and tremors.

There is no specific antidote for overdose with Kaletra. Treatment of overdose with Kaletra is to consist of general supportive measures including monitoring of vital signs and observation of the clinical status of the patient. If indicated, elimination of unabsorbed active substance is to be achieved by emesis or gastric lavage. Administration of activated charcoal may also be used to aid in removal of unabsorbed active substance. Since Kaletra is highly protein bound, dialysis is unlikely to be beneficial in significant removal of the active substance.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmaco-therapeutic group: protease inhibitor, ATC code: J05AE06

Mechanism of action: Lopinavir provides the antiviral activity of Kaletra. Lopinavir is an inhibitor of the HIV-1 and HIV-2 proteases. Inhibition of HIV protease prevents cleavage of the gag-pol polyprotein resulting in the production of immature, non-infectious virus.

Effects on the electrocardiogram: QTcF interval was evaluated in a randomised, placebo and active (moxifloxacin 400 mg once daily) controlled crossover study in 39 healthy adults, with 10 measurements over 12 hours on Day 3. The maximum mean (95% upper confidence bound) differences in QTcF from placebo were 3.6 (6.3) and 13.1(15.8) for 400/100 mg twice daily and supratherapeutic 800/200 mg twice daily LPV/r, respectively. The induced QRS interval prolongation from 6 ms to 9.5 ms with high dose lopinavir/ritonavir (800/200 mg twice daily) contributes to QT prolongation. The two regimens resulted in exposures on Day 3 which were approximately 1.5 and 3-fold higher than those observed with recommended once daily or twice daily LPV/r doses at steady state. No subject experienced an increase in QTcF of ≥ 60 msec from baseline or a QTcF interval exceeding the potentially clinically relevant threshold of 500 msec.

Modest prolongation of the PR interval was also noted in subjects receiving lopinavir/ritonavir in the same study on Day 3. The mean changes from baseline in PR interval ranged from 11.6 ms to 24.4 ms in the 12 hour interval post dose. Maximum PR interval was 286 msec and no second or third degree heart block was observed (see section 4.4).

Antiviral activity in vitro: the in vitro antiviral activity of lopinavir against laboratory and clinical HIV strains was evaluated in acutely infected lymphoblastic cell lines and peripheral blood lymphocytes, respectively. In the absence of human serum, the mean IC_{50} of lopinavir against five different HIV-1 laboratory strains was 19 nM. In the absence and presence of 50% human serum, the mean IC_{50} of lopinavir against HIV-1_HXB in MT4 cells was 17 nM and 102 nM, respectively. In the absence of human serum, the mean IC_{50} of lopinavir was 6.5 nM against several HIV-1 clinical isolates.

Resistance
In vitro selection of resistance:

HIV-1 isolates with reduced susceptibility to lopinavir have been selected in vitro. HIV-1 has been passaged in vitro with lopinavir alone and with lopinavir plus ritonavir at concentration ratios representing the range of plasma concentration ratios observed during Kaletra therapy. Genotypic and phenotypic analysis of viruses selected in these passages suggest that the presence of ritonavir, at these concentration ratios, does not measurably influence the selection of lopinavir-resistant viruses. Overall, the in vitro characterisation of phenotypic cross-resistance between lopinavir and other protease inhibitors suggest that decreased susceptibility to lopinavir correlated closely with decreased susceptibility to ritonavir and indinavir, but did not correlate closely with decreased susceptibility to amprenavir, saquinavir, and nelfinavir.

Analysis of resistance in ARV-naïve patients:

In clinical studies with a limited number of isolates analysed, the selection of resistance to lopinavir has not been observed in naïve patients without significant protease inhibitor resistance at baseline. See further the detailed description of the clinical studies.

Analysis of resistance in PI-experienced patients:

The selection of resistance to lopinavir in patients having failed prior protease inhibitor therapy was characterised by analysing the longitudinal isolates from 19 protease inhibitor-experienced subjects in 2 Phase II and one Phase III studies who either experienced incomplete virologic suppression or viral rebound subsequent to initial response to Kaletra and who demonstrated incremental in vitro resistance between baseline and rebound (defined as emergence of new mutations or 2-fold change in phenotypic susceptibility to lopinavir). Incremental resistance was most common in subjects whose baseline isolates had several protease inhibitor-associated mutations, but < 40-fold reduced susceptibility to lopinavir at baseline. Mutations V82A, I54V and M46I emerged most frequently. Mutations L33F, I50V and V32I combined with I47V/A were also observed. The 19 isolates demonstrated a 4.3-fold increase in IC50 compared to baseline isolates (from 6.2- to 43-fold, compared to wild-type virus).

Genotypic correlates of reduced phenotypic susceptibility to lopinavir in viruses selected by other protease inhibitors. The in vitro antiviral activity of lopinavir against 112 clinical isolates taken from patients failing therapy with one or more protease inhibitors was assessed. Within this panel, the following mutations in HIV protease were associated with reduced in vitro susceptibility to lopinavir: L10F/I/R/V, K20M/R, L24I, M46I/L, F53L, I54L/T/V, L63P, A71I/L/T/V, V82A/F/T, I84V and L90M. The median EC50 of lopinavir against isolates with 0−3, 4−5, 6−7 and 8−10 mutations at the above amino acid positions was 0.8, 2.7 13.5 and 44.0-fold higher than the EC50 against wild type HIV, respectively. The 16 viruses that displayed >20-fold change in susceptibility all contained mutations at positions 10, 54, 63 plus 82 and/or 84. In addition, they contained a median of 3 mutations at amino acid positions 20, 24, 46, 53, 71 and 90. In addition to the mutations described above, mutations V32I and I47A have been observed in rebound isolates with reduced lopinavir susceptibility from protease inhibitor experienced patients receiving Kaletra therapy, and mutations I47A and L76V have been observed in rebound isolates with reduced lopinavir susceptibility from patients receiving Kaletra therapy.

Conclusions regarding the relevance of particular mutations or mutational patterns are subject to change with additional data, and it is recommended to always consult current interpretation systems for analysing resistance test results.

Antiviral activity of Kaletra in patients failing protease inhibitor therapy: the clinical relevance of reduced in vitro susceptibility to lopinavir has been examined by assessing the virologic response to Kaletra therapy, with respect to baseline viral genotype and phenotype, in 56 patients previous failing therapy with multiple protease inhibitors. The EC50 of lopinavir against the 56 baseline viral isolates ranged from 0.6 to 96-fold higher than the EC50 against wild type HIV. After 48 weeks of treatment with Kaletra, efavirenz and nucleoside reverse transcriptase inhibitors, plasma HIV RNA ≤ 400 copies/ml was observed in 93% (25/27), 73% (11/15), and 25% (2/8) of patients with < 10-fold, 10 to 40-fold, and > 40-fold reduced susceptibility to lopinavir at baseline, respectively. In addition,
virologic response was observed in 91% (21/23), 71% (15/21) and 33% (2/6) patients with 0 – 5, 6 – 7, and 8 – 10 mutations of the above mutations in HIV protease associated with reduced in vitro susceptibility to lopinavir. Since these patients had not previously been exposed to either Kaletra or efavirenz, part of the response may be attributed to the antiviral activity of efavirenz, particularly in patients harbouring highly lopinavir resistant virus. The study did not contain a control arm of patients not receiving Kaletra.

Cross-resistance: Activity of other protease inhibitors against isolates that developed incremental resistance to lopinavir after Kaletra therapy in protease inhibitor experienced patients: The presence of cross resistance to other protease inhibitors was analysed in 18 rebound isolates that had demonstrated evolution of resistance to lopinavir during 3 Phase II and one Phase III studies of Kaletra in protease inhibitor-experienced patients. The median fold IC50 of lopinavir for these 18 isolates at baseline and rebound was 6.9- and 63-fold, respectively, compared to wild type virus. In general, rebound isolates either retained (if cross-resistant at baseline) or developed significant cross-resistance to indinavir, saquinavir and atazanavir. Modest decreases in amprenavir activity were noted with a median increase of IC50 from 3.7- to 8-fold in the baseline and rebound isolates, respectively. Isolates retained susceptibility to tipranavir with a median increase of IC50 in baseline and rebound isolates of 1.9- and 1.8–fold, respectively, compared to wild type virus. Please refer to the Aptivus Summary of Product Characteristics for additional information on the use of tipranavir, including genotypic predictors of response, in treatment of lopinavir-resistant HIV-1 infection.

Clinical results

The effects of Kaletra (in combination with other antiretroviral agents) on biological markers (plasma HIV RNA levels and CD4+ T-cell counts) have been investigated in a controlled studies of Kaletra of 48 to 360 weeks duration.

Adult Use

Patients without prior antiretroviral therapy

Study M98-863 was a randomised, double-blind trial of 653 antiretroviral treatment naïve patients investigating Kaletra (400/100 mg twice daily) compared to nelfinavir (750 mg three times daily) plus stavudine and lamivudine. Mean baseline CD4+ T-cell count was 259 cells/mm³ (range: 2 to 949 cells/mm³) and mean baseline plasma HIV-1 RNA was 4.9 log10 copies/ml (range: 2.6 to 6.8 log10 copies/ml).

Table 1

<table>
<thead>
<tr>
<th>Outcomes at Week 48: Study M98-863</th>
<th>Kaletra (N=326)</th>
<th>Nelfinavir (N=327)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml*</td>
<td>75%</td>
<td>63%</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml†</td>
<td>67%</td>
<td>52%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>207</td>
<td>195</td>
</tr>
</tbody>
</table>

* intent to treat analysis where patients with missing values are considered virologic failures
† p<0.001

One-hundred thirteen nelfinavir-treated patients and 74 lopinavir/ritonavir-treated patients had an HIV RNA above 400 copies/ml while on treatment from Week 24 through Week 96. Of these, isolates from 96 nelfinavir-treated patients and 51 lopinavir/ritonavir-treated patients could be amplified for resistance testing. Resistance to nelfinavir, defined as the presence of the D30N or L90M mutation in protease, was observed in 41/96 (43%) patients. Resistance to lopinavir, defined as the presence of any primary or active site mutations in protease (see above), was observed in 0/51 (0%) patients. Lack of resistance to lopinavir was confirmed by phenotypic analysis.
Study M05-730 was a randomised, open-label, multicentre trial comparing treatment with Kaletra 800/200 mg once daily plus tenofovir DF and emtricitabine versus Kaletra 400/100 mg twice daily plus tenofovir DF and emtricitabine in 664 antiretroviral treatment-naïve patients. Given the pharmacokinetic interaction between Kaletra and tenofovir (see section 4.5), the results of this study might not be strictly extrapolable when other backbone regimens are used with Kaletra. Patients were randomised in a 1:1 ratio to receive either Kaletra 800/200 mg once daily (n = 333) or Kaletra 400/100 mg twice daily (n = 331). Further stratification within each group was 1:1 (tablet versus. soft capsule). Patients were administered either the tablet or the soft capsule formulation for 8 weeks, after which all patients were administered the tablet formulation once daily or twice daily for the remainder of the study. Patients were administered emtricitabine 200 mg once daily and tenofovir DF 300 mg once daily. Protocol defined non-inferiority of once daily dosing compared with twice daily dosing was demonstrated if the lower bound of the 95% confidence interval for the difference in proportion of subjects responding (once daily minus twice daily) excluded -12% at Week 48. Mean age of patients enrolled was 39 years (range: 19 to 71); 75% were Caucasian, and 78% were male. Mean baseline CD4+ T-cell count was 216 cells/mm³ (range: 20 to 775 cells/mm³) and mean baseline plasma HIV-1 RNA was 5.0 log₁₀ copies/ml (range: 1.7 to 7.0 log₁₀ copies/ml).

Table 2

<table>
<thead>
<tr>
<th>Virologic Response of Study Subjects at Week 48 and Week 96</th>
<th>Week 48</th>
<th>Week 96</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>QD</td>
<td>BID</td>
</tr>
<tr>
<td>NC= Failure</td>
<td>257/333 (77.2%)</td>
<td>251/331 (75.8%)</td>
</tr>
<tr>
<td></td>
<td>1.3 % [-5.1, 7.8]</td>
<td>216/333 (64.9%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observed data</td>
<td>257/295 (87.1%)</td>
<td>250/280 (89.3%)</td>
</tr>
<tr>
<td></td>
<td>-2.2 % [-7.4, 3.1]</td>
<td>216/247 (87.4%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>186</td>
<td>198</td>
</tr>
<tr>
<td></td>
<td>238</td>
<td>254</td>
</tr>
</tbody>
</table>

Through Week 96, genotypic resistance testing results were available from 25 patients in the QD group and 26 patients in the BID group who had incomplete virologic response. In the QD group, no patient demonstrated lopinavir resistance, and in the BID group, 1 patient who had significant protease inhibitor resistance at baseline demonstrated additional lopinavir resistance on study.

Sustained virological response to Kaletra (in combination with nucleoside/nucleotide reverse transcriptase inhibitors) has been also observed in a small Phase II study (M97-720) through 360 weeks of treatment. One hundred patients were originally treated with Kaletra in the study (including 51 patients receiving 400/100 mg twice daily and 49 patients at either 200/100 mg twice daily or 400/200 mg twice daily). All patients converted to open-label Kaletra at the 400/100 mg twice daily dose between week 48 and week 72. Thirty-nine patients (39%) discontinued the study, including 16 (16%) discontinuations due to adverse events, one of which was associated with a death. Sixty-one patients completed the study (35 patients received the recommended 400/100 mg twice daily dose throughout the study).

Table 3

<table>
<thead>
<tr>
<th>Outcomes at Week 360: Study M97-720</th>
<th>Kaletra (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml</td>
<td>61%</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml</td>
<td>59%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>501</td>
</tr>
</tbody>
</table>
Through 360 weeks of treatment, genotypic analysis of viral isolates was successfully conducted in 19 of 28 patients with confirmed HIV RNA above 400 copies/ml revealed no primary or active site mutations in protease (amino acids at positions 8, 30, 32, 46, 47, 48, 50, 82, 84 and 90) or protease inhibitor phenotypic resistance.

Patients with prior antiretroviral therapy

M06-802 was a randomised open-label study comparing the safety, tolerability and antiviral activity of once daily and twice daily dosing of lopinavir/ritonavir tablets in 599 subjects with detectable viral loads while receiving their current antiviral therapy. Patients had not been on prior lopinavir/ritonavir therapy. They were randomised in a 1:1 ratio to receive either lopinavir/ritonavir 800/200 mg once daily (n = 300) or lopinavir/ritonavir 400/100 mg twice daily (n = 299). Patients were administered at least two nucleoside/nucleotide reverse transcriptase inhibitors selected by the investigator. The enrolled population was moderately PI-experienced with more than half of patients having never received prior PI and around 80% of patients presenting a viral strain with less than 3 PI mutations. Mean age of patients enrolled was 41 years (range: 21 to 73); 51% were Caucasian and 66% were male. Mean baseline CD4+ T-cell count was 254 cells/mm³ (range: 4 to 952 cells/mm³) and mean baseline plasma HIV-1 RNA was 4.3 log₁₀ copies/ml (range: 1.7 to 6.6 log₁₀ copies/ml). Around 85% of patients had a viral load of <100,000 copies/ml.

Table 4

<table>
<thead>
<tr>
<th>Virologic Response of Study Subjects at Week 48 Study 802</th>
<th>QD</th>
<th>BID</th>
<th>Difference [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>NC= Failure</td>
<td>171/300 (57%)</td>
<td>161/299 (53.8%)</td>
<td>3.2% [-4.8%, 11.1%]</td>
</tr>
<tr>
<td>Observed data</td>
<td>171/225 (76.0%)</td>
<td>161/223 (72.2%)</td>
<td>3.8% [-4.3%, 11.9%]</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>135</td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

Through Week 48, genotypic resistance testing results were available from 75 patients in the QD group and 75 patients in the BID group who had incomplete virologic response. In the QD group, 6/75 (8%) patients demonstrated new primary protease inhibitor mutations (codons 30, 32, 48, 50, 82, 84, 90), as did 12/77 (16%) patients in the BID group.

Paediatric Use

M98-940 was an open-label study of a liquid formulation of Kaletra in 100 antiretroviral naïve (44%) and experienced (56%) paediatric patients. All patients were non-nucleoside reverse transcriptase inhibitor naïve. Patients were randomised to either 230 mg lopinavir/57.5 mg ritonavir per m² or 300 mg lopinavir/75 mg ritonavir per m². Naïve patients also received nucleoside reverse transcriptase inhibitors. Experienced patients received nevirapine plus up to two nucleoside reverse transcriptase inhibitors. Safety, efficacy and pharmacokinetic profiles of the two dose regimens were assessed after 3 weeks of therapy in each patient. Subsequently, all patients were continued on the 300/75 mg per m² dose. Patients had a mean age of 5 years (range 6 months to 12 years) with 14 patients less than 2 years old and 6 patients one year or less. Mean baseline CD4+ T-cell count was 838 cells/mm³ and mean baseline plasma HIV-1 RNA was 4.7 log₁₀ copies/ml.
Table 5

<table>
<thead>
<tr>
<th></th>
<th>Antiretroviral Naïve (N=44)</th>
<th>Antiretroviral Experienced (N=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml</td>
<td>84%</td>
<td>75%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>404</td>
<td>284</td>
</tr>
</tbody>
</table>

5.2 Pharmacokinetic properties

The pharmacokinetic properties of lopinavir co-administered with ritonavir have been evaluated in healthy adult volunteers and in HIV-infected patients; no substantial differences were observed between the two groups. Lopinavir is essentially completely metabolised by CYP3A. Ritonavir inhibits the metabolism of lopinavir, thereby increasing the plasma levels of lopinavir. Across studies, administration of Kaletra 400/100 mg twice daily yields mean steady-state lopinavir plasma concentrations 15 to 20-fold higher than those of ritonavir in HIV-infected patients. The plasma levels of ritonavir are less than 7% of those obtained after the ritonavir dose of 600 mg twice daily. The *in vitro* antiviral EC₅₀ of lopinavir is approximately 10-fold lower than that of ritonavir. Therefore, the antiviral activity of Kaletra is due to lopinavir.

Absorption: multiple dosing with 400/100 mg Kaletra twice daily for 2 weeks and without meal restriction produced a mean ± SD lopinavir peak plasma concentration (Cₘₚₚ) of 12.3 ± 5.4 μg/ml, occurring approximately 4 hours after administration. The mean steady-state trough concentration prior to the morning dose was 8.1 ± 5.7 μg/ml. Lopinavir AUC over a 12 hour dosing interval averaged 113.2 ± 60.5 μg•h/ml. The absolute bioavailability of lopinavir co-formulated with ritonavir in humans has not been established.

Effects of food on oral absorption: Administration of a single 400/100 mg dose of Kaletra tablets under fed conditions (high fat, 872 kcal, 56% from fat) compared to fasted state was associated with no significant changes in Cₘₚₚ and AUCₘₚₚ. Therefore, Kaletra tablets may be taken with or without food. Kaletra tablets have also shown less pharmacokinetic variability under all meal conditions compared to Kaletra soft capsules.

Distribution: at steady state, lopinavir is approximately 98 – 99% bound to serum proteins. Lopinavir binds to both alpha-1-acid glycoprotein (AAG) and albumin, however, it has a higher affinity for AAG. At steady state, lopinavir protein binding remains constant over the range of observed concentrations after 400/100 mg Kaletra twice daily, and is similar between healthy volunteers and HIV-positive patients.

Metabolism: *in vitro* experiments with human hepatic microsomes indicate that lopinavir primarily undergoes oxidative metabolism. Lopinavir is extensively metabolised by the hepatic cytochrome P450 system, almost exclusively by isozyme CYP3A. Ritonavir is a potent CYP3A inhibitor which inhibits the metabolism of lopinavir and therefore, increases plasma levels of lopinavir. A ¹⁴C-lopinavir study in humans showed that 89% of the plasma radioactivity after a single 400/100 mg Kaletra dose was due to parent active substance. At least 13 lopinavir oxidative metabolites have been identified in man. The 4-oxo and 4-hydroxymetabolite epimeric pair are the major metabolites with antiviral activity, but comprise only minute amounts of total plasma radioactivity. Ritonavir has been shown to induce metabolic enzymes, resulting in the induction of its own metabolism, and likely the induction of lopinavir metabolism. Pre-dose lopinavir concentrations decline with time during multiple dosing, stabilising after approximately 10 days to 2 weeks.

Elimination: after a 400/100 mg ¹⁴C-lopinavir/ritonavir dose, approximately 10.4 ± 2.3% and 82.6 ± 2.5% of an administered dose of ¹⁴C-lopinavir can be accounted for in urine and faeces, respectively. Unchanged lopinavir accounted for approximately 2.2% and 19.8% of the administered dose in urine and faeces, respectively. After multiple dosing, less than 3% of the lopinavir dose is
excreted unchanged in the urine. The effective (peak to trough) half-life of lopinavir over a 12 hour
dosing interval averaged 5 – 6 hours, and the apparent oral clearance (CL/F) of lopinavir is 6 to 7 l/h.

Once daily dosing: the pharmacokinetics of once daily Kaletra have been evaluated in HIV-infected
subjects naïve to antiretroviral treatment. Kaletra 800/200 mg was administered in combination with
emtricitabine 200 mg and tenofovir DF 300 mg as part of a once daily regimen. Multiple dosing of
800/200 mg Kaletra once daily for 2 weeks without meal restriction (n=16) produced a mean ± SD
lopinavir peak plasma concentration (C<sub>max</sub>) of 14.8 ± 3.5 μg/ml, occurring approximately 6 hours after
administration. The mean steady-state trough concentration prior to the morning dose was 5.5 ± 5.4
μg/ml. Lopinavir AUC over a 24 hour dosing interval averaged 206.5 ± 89.7 μg·h/ml.

As compared to the BID regimen, the once daily dosing is associated with a reduction in the
C<sub>min</sub>/C<sub>trough</sub> values of approximately 50%.

Special Populations

Paediatrics:

There are limited pharmacokinetic data in children below 2 years of age. The pharmacokinetics of
Kaletra oral solution 300/75 mg/m<sup>2</sup> twice daily and 230/57.5 mg/m<sup>2</sup> twice daily have been studied in a
total of 53 paediatric patients, ranging in age from 6 months to 12 years. The lopinavir mean steady-
state AUC, C<sub>max</sub>, and C<sub>min</sub> were 72.6 ± 31.1 μg·h/ml, 8.2 ± 2.9 μg/ml and 3.4 ± 2.1 μg/ml, respectively
after Kaletra oral solution 230/57.5 mg/m<sup>2</sup> twice daily without nevirapine (n=12), and were
85.8 ± 36.9 μg·h/ml, 10.0 ± 3.3 μg/ml and 3.6 ± 3.5 μg/ml, respectively after 300/75 mg/m<sup>2</sup> twice
daily with nevirapine (n=12). The 230/57.5 mg/m<sup>2</sup> twice daily regimen without nevirapine and the
300/75 mg/m<sup>2</sup> twice daily regimen with nevirapine provided lopinavir plasma concentrations similar
to those obtained in adult patients receiving the 400/100 mg twice daily regimen without nevirapine.
Kaletra once daily has not been evaluated in paediatric patients.

Gender, Race and Age:

Kaletra pharmacokinetics have not been studied in the elderly. No age or gender related
pharmacokinetic differences have been observed in adult patients. Pharmacokinetic differences due to
race have not been identified.

Renal Insufficiency:

Kaletra pharmacokinetics have not been studied in patients with renal insufficiency; however, since
the renal clearance of lopinavir is negligible, a decrease in total body clearance is not expected in
patients with renal insufficiency.

Hepatic Insufficiency:

The steady state pharmacokinetic parameters of lopinavir in HIV-infected patients with mild to
moderate hepatic impairment were compared with those of HIV-infected patients with normal hepatic
function in a multiple dose study with lopinavir/ritonavir 400/100 mg twice daily. A limited increase
in total lopinavir concentrations of approximately 30% has been observed which is not expected to be
of clinical relevance (see section 4.2).

5.3 Preclinical safety data

Repeat-dose toxicity studies in rodents and dogs identified major target organs as the liver, kidney,
thyroid, spleen and circulating red blood cells. Hepatic changes indicated cellular swelling with focal
degeneration. While exposure eliciting these changes were comparable to or below human clinical
exposure, dosages in animals were over 6-fold the recommended clinical dose. Mild renal tubular
degeneration was confined to mice exposed with at least twice the recommended human exposure; the
kidney was unaffected in rats and dogs. Reduced serum thyroxin led to an increased release of TSH
with resultant follicular cell hypertrophy in the thyroid glands of rats. These changes were reversible with withdrawal of the active substance and were absent in mice and dogs. Coombs-negative anisocytosis and poikilocytosis were observed in rats, but not in mice or dogs. Enlarged spleens with histiocytosis were seen in rats but not other species. Serum cholesterol was elevated in rodents but not dogs, while triglycerides were elevated only in mice.

During *in vitro* studies, cloned human cardiac potassium channels (HERG) were inhibited by 30% at the highest concentrations of lopinavir/ritonavir tested, corresponding to a lopinavir exposure 7-fold total and 15-fold free peak plasma levels achieved in humans at the maximum recommended therapeutic dose. In contrast, similar concentrations of lopinavir/ritonavir demonstrated no repolarisation delay in the canine cardiac Purkinje fibres. Lower concentrations of lopinavir/ritonavir did not produce significant potassium (HERG) current blockade. Tissue distribution studies conducted in the rat did not suggest significant cardiac retention of the active substance; 72-hour AUC in heart was approximately 50% of measured plasma AUC. Therefore, it is reasonable to expect that cardiac lopinavir levels would not be significantly higher than plasma levels.

In dogs, prominent U waves on the electrocardiogram have been observed associated with prolonged PR interval and bradycardia. These effects have been assumed to be caused by electrolyte disturbance.

The clinical relevance of these preclinical data is unknown, however, the potential cardiac effects of this product in humans cannot be ruled out (see also sections 4.4 and 4.8).

In rats, embryofoetotoxicity (pregnancy loss, decreased foetal viability, decreased foetal body weights, increased frequency of skeletal variations) and postnatal developmental toxicity (decreased survival of pups) was observed at maternally toxic dosages. The systemic exposure to lopinavir/ritonavir at the maternal and developmental toxic dosages was lower than the intended therapeutic exposure in humans.

Long-term carcinogenicity studies of lopinavir/ritonavir in mice revealed a nongenotoxic, mitogenic induction of liver tumours, generally considered to have little relevance to human risk.

Carcinogenicity studies in rats revealed no tumourigenic findings. Lopinavir/ritonavir was not found to be mutagenic or clastogenic in a battery of *in vitro* and *in vivo* assays including the Ames bacterial reverse mutation assay, the mouse lymphoma assay, the mouse micronucleus test and chromosomal aberration assays in human lymphocytes.

6. **PHARMACEUTICAL PARTICULARS**

6.1 **List of excipients**

**Tablet contents:**
- Copovidone
- Sorbitan laurate
- Colloidal anhydrous silica
- Sodium stearyl fumarate

**Film-coating:**
- Hypromellose
- Titanium dioxide
- Macrogols type 400 (Polyethylene glycol 400)
- Hydroxypropyl cellulose
- Talc
- Colloidal anhydrous silica
- Macrogols type 3350 (Polyethylene glycol 3350)
- Yellow ferric oxide E172
6.2 Incompatibilities

Not applicable.

6.3 Shelf life

3 years.

6.4 Special precautions for storage

This medicinal product does not require any special storage conditions.

6.5 Nature and content of container

High density polyethylene (HDPE) bottles closed with propylene caps. Each bottle contains 120 tablets.

Two pack sizes are available:
- 1 bottle of 120 tablets
- 3 bottles of 120 tablets (360 tablets)

Blisters consisting of PVC/fluoropolymer foil.

Two pack sizes are available:
- 1 carton containing 10 foil blisters. Each blister contains 12 film-coated tablets (120 tablets).
- 5 cartons each containing 5 foil blisters. Each blister contains 8 film-coated tablets (40 tablets).

Each pack contains 3 cartons (120 tablets).

Not all pack sizes may be marketed.

6.6 Special precautions for disposal

No special requirements.

7. MARKETING AUTHORISATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

8. MARKETING AUTHORISATION NUMBERS

EU/1/01/172/004
EU/1/01/172/005
EU/1/01/172/007
EU/1/01/172/008

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 20 March 2001
Date of last renewal: 20 March 2006
10. DATE OF REVISION OF THE TEXT

{MM/YYYY}
1. NAME OF THE MEDICINAL PRODUCT

Kaletra 100 mg/25 mg film-coated tablets

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each film-coated tablet contains 100 mg of lopinavir co-formulated with 25 mg of ritonavir as a pharmacokinetic enhancer.

For a full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Film-coated tablet

Pale yellow debossed with [Abbott logo] and “KC”.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Kaletra is indicated for the treatment of HIV-1 infected children above the age of 2 years and adults, in combination with other antiretroviral agents.

Most experience with Kaletra is derived from the use of the product in antiretroviral therapy naïve patients.

The choice of Kaletra to treat protease inhibitor experienced HIV-1 infected patients should be based on individual viral resistance testing and treatment history of patients (see sections 4.4 and 5.1).

4.2 Posology and method of administration

Kaletra should be prescribed by physicians who are experienced in the treatment of HIV infection.

Kaletra tablets should be swallowed whole and not chewed, broken or crushed.

Adult and adolescent use: the standard recommended dosage of Kaletra tablets is 400/100 mg (two 200/50 mg) tablets twice daily taken with or without food. In adult patients, in cases where once daily dosing is considered necessary for the management of the patient, Kaletra tablets may be administered as 800/200 mg (four 200/50 mg tablets) once daily with or without food. The use of a once daily dosing should be limited to those adult patients having only very few protease inhibitor (PI) associated mutations (i.e. less than 3 PI mutations in line with clinical trial results, see section 5.1 for the full description of the population) and should take into account the risk of a lesser sustainability of the virologic suppression (see section 5.1) and higher risk of diarrhoea (see section 4.8) compared to the recommended standard twice daily dosing. An oral solution is available to patients who have difficulty swallowing. Refer to the Summary of Product Characteristics for Kaletra oral solution for dosing instructions.

Paediatric use (2 years of age and above): the adult dose of Kaletra tablets (400/100 mg twice daily) may be used in children 40 kg or greater or with a Body Surface Area (BSA)* greater than 1.4 m². For children weighing less than 40 kg or with a BSA between 0.5 and 1.4 m² and able to swallow tablets, refer to the dosing guideline tables below. For children unable to swallow tablets, please refer to the Kaletra oral solution Summary of Product Characteristics. Kaletra dosed once daily has not been evaluated in paediatric patients.
Before prescribing Kaletra 100/25 mg tablets, infants and young children should be assessed for the ability to swallow intact tablets. If a child is unable to reliably swallow a Kaletra tablet, Kaletra oral solution formulation should be prescribed.

The following table contains dosing guidelines for Kaletra 100/25 mg tablets based on BSA.

<table>
<thead>
<tr>
<th>Body Surface Area (m²)</th>
<th>Recommended number of 100/25 mg tablets twice-daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 0.5 to &lt; 0.9</td>
<td>2 tablets (200/50 mg)</td>
</tr>
<tr>
<td>≥ 0.9 to &lt; 1.4</td>
<td>3 tablets (300/75 mg)</td>
</tr>
<tr>
<td>≥ 1.4</td>
<td>4 tablets (400/100 mg)</td>
</tr>
</tbody>
</table>

If more convenient for patients, the Kaletra 200/50 mg tablets may also be considered alone or in combination with the Kaletra 100/25 mg tablet to achieve the recommended dose.

* Body surface area can be calculated with the following equation:

\[
\text{BSA (m²)} = \sqrt{\frac{\text{Height (cm)} \times \text{Weight (kg)}}{3600}}
\]

Children less than 2 years of age: Kaletra is not recommended for use in children below 2 years of age due to insufficient data on safety and efficacy (see section 5.1).

**Concomitant Therapy: Efavirenz or nevirapine**

The following table contains dosing guidelines for Kaletra 100/25 mg tablets based on BSA when used in combination with efavirenz or nevirapine in children.

<table>
<thead>
<tr>
<th>Body Surface Area (m²)</th>
<th>Recommended number of 100/25 mg tablets twice-daily</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 0.5 to &lt; 0.8</td>
<td>2 tablets (200/50 mg)</td>
</tr>
<tr>
<td>≥ 0.8 to &lt; 1.2</td>
<td>3 tablets (300/75 mg)</td>
</tr>
<tr>
<td>≥ 1.2 to &lt; 1.4</td>
<td>4 tablets (400/100 mg)</td>
</tr>
<tr>
<td>≥ 1.4</td>
<td>5 tablets (500/125 mg)</td>
</tr>
</tbody>
</table>

If more convenient for patients, the Kaletra 200/50 mg tablets may also be considered alone or in combination with the Kaletra 100/25 mg tablet to achieve the recommended dose.

**Hepatic impairment**: In HIV-infected patients with mild to moderate hepatic impairment, an increase of approximately 30% in lopinavir exposure has been observed but is not expected to be of clinical relevance (see section 5.2). No data are available in patients with severe hepatic impairment. Kaletra should not be given to these patients (see section 4.3).

**Renal impairment**: since the renal clearance of lopinavir and ritonavir is negligible, increased plasma concentrations are not expected in patients with renal impairment. Because lopinavir and ritonavir are highly protein bound, it is unlikely that they will be significantly removed by haemodialysis or peritoneal dialysis.
4.3 Contraindications

Hypersensitivity to the active substances or to any of the excipients.

Patients with severe hepatic insufficiency.

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Kaletra should not be co-administered with medicinal products that are highly dependent on CYP3A for clearance and for which elevated plasma concentrations are associated with serious and/or life threatening events. These medicinal products include astemizole, terfenadine, oral midazolam (for caution on parenterally administered midazolam, see section 4.5), triazolam, cisapride, pimozide, amiodarone, ergot alkaloids (e.g. ergotamine, dihydroergotamine, ergonovine and methylergonovine) lovastatin, simvastatin, sildenafil used for the treatment of pulmonary arterial hypertension (for the use of sildenafil in patients with erectile dysfunction, see section 4.5) and vardenafil.

Herbal preparations containing St John’s wort (*Hypericum perforatum*) must not be used while taking lopinavir and ritonavir due to the risk of decreased plasma concentrations and reduced clinical effects of lopinavir and ritonavir (see section 4.5).

4.4 Special warnings and precautions for use

**Patients with coexisting conditions**

*Hepatic impairment:* the safety and efficacy of Kaletra has not been established in patients with significant underlying liver disorders. Kaletra is contraindicated in patients with severe liver impairment (see section 4.3). Patients with chronic hepatitis B or C and treated with combination antiretroviral therapy are at an increased risk for severe and potentially fatal hepatic adverse reactions. In case of concomitant antiviral therapy for hepatitis B or C, please refer to the relevant product information for these medicinal products.

Patients with pre-existing liver dysfunction including chronic hepatitis have an increased frequency of liver function abnormalities during combination antiretroviral therapy and should be monitored according to standard practice. If there is evidence of worsening liver disease in such patients, interruption or discontinuation of treatment should be considered.

*Renal impairment:* since the renal clearance of lopinavir and ritonavir is negligible, increased plasma concentrations are not expected in patients with renal impairment. Because lopinavir and ritonavir are highly protein bound, it is unlikely that they will be significantly removed by haemodialysis or peritoneal dialysis.

*Haemophilia:* there have been reports of increased bleeding, including spontaneous skin haematomas and haemarthrosis in patients with haemophilia type A and B treated with protease inhibitors. In some patients additional factor VIII was given. In more than half of the reported cases, treatment with protease inhibitors was continued or reintroduced if treatment had been discontinued. A causal relationship had been evoked, although the mechanism of action had not been elucidated. Haemophiliac patients should therefore be made aware of the possibility of increased bleeding.

*Lipid elevations*

Treatment with Kaletra has resulted in increases, sometimes marked, in the concentration of total cholesterol and triglycerides. Triglyceride and cholesterol testing is to be performed prior to initiating Kaletra therapy and at periodic intervals during therapy. Particular caution should be paid to patients with high values at baseline and with history of lipid disorders. Lipid disorders are to be managed as clinically appropriate (see also section 4.5 for additional information on potential interactions with HMG-CoA reductase inhibitors).
**Pancreatitis**

Cases of pancreatitis have been reported in patients receiving Kaletra, including those who developed hypertriglyceridaemia. In most of these cases patients have had a prior history of pancreatitis and/or concurrent therapy with other medicinal products associated with pancreatitis. Marked triglyceride elevation is a risk factor for development of pancreatitis. Patients with advanced HIV disease may be at risk of elevated triglycerides and pancreatitis.

Pancreatitis should be considered if clinical symptoms (nausea, vomiting, abdominal pain) or abnormalities in laboratory values (such as increased serum lipase or amylase values) suggestive of pancreatitis should occur. Patients who exhibit these signs or symptoms should be evaluated and Kaletra therapy should be suspended if a diagnosis of pancreatitis is made (see section 4.8).

**Hyperglycaemia**

New onset diabetes mellitus, hyperglycaemia or exacerbation of existing diabetes mellitus has been reported in patients receiving protease inhibitors. In some of these the hyperglycaemia was severe and in some cases also associated with ketoacidosis. Many patients had confounding medical conditions some of which required therapy with agents that have been associated with the development of diabetes mellitus or hyperglycaemia.

**Fat redistribution and metabolic disorders**

Combination antiretroviral therapy has been associated with redistribution of body fat (lipodystrophy) in HIV patients. The long-term consequences of these events are currently unknown. Knowledge about the mechanism is incomplete. A connection between visceral lipomatosis and protease inhibitors (PIs) and lipatrophy and nucleoside reverse transcriptase inhibitors (NRTIs) has been hypothesised. A higher risk of lipodystrophy has been associated with individual factors such as older age, and with drug related factors such as longer duration of antiretroviral treatment and associated metabolic disturbances. Clinical examination should include evaluation for physical signs of fat redistribution. Consideration should be given to measurement of fasting serum lipids and blood glucose. Lipid disorders should be managed as clinically appropriate (see section 4.8).

**Immune Reactivation Syndrome**

In HIV-infected patients with severe immune deficiency at the time of institution of combination antiretroviral therapy (CART), an inflammatory reaction to asymptomatic or residual opportunistic pathogens may arise and cause serious clinical conditions, or aggravation of symptoms. Typically, such reactions have been observed within the first few weeks or months of initiation of CART. Relevant examples are cytomegalovirus retinitis, generalised and/or focal mycobacterial infections, and *Pneumocystis jiroveci pneumonia*. Any inflammatory symptoms should be evaluated and treatment instituted when necessary.

**Osteonecrosis**

Although the etiology is considered to be multifactorial (including corticosteroid use, alcohol consumption, severe immunosuppression, higher body mass index), cases of osteonecrosis have been reported particularly in patients with advanced HIV-disease and/or long-term exposure to combination antiretroviral therapy (CART). Patients should be advised to seek medical advice if they experience joint aches and pain, joint stiffness or difficulty in movement.

**PR interval prolongation**

Lopinavir/ritonavir has been shown to cause modest asymptomatic prolongation of the PR interval in some healthy adult subjects. Rare reports of 2nd or 3rd degree atrioventricular block in patients with underlying structural heart disease and pre-existing conduction system abnormalities or in patients receiving drugs known to prolong the PR interval (such as verapamil or atazanavir) have been reported.
in patients receiving lopinavir/ritonavir. Kaletra should be used with caution in such patients (see section 5.1).

**Interactions with medicinal products**

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Kaletra is likely to increase plasma concentrations of medicinal products that are primarily metabolised by CYP3A. These increases of plasma concentrations of co-administered medicinal products could increase or prolong their therapeutic effect and adverse events (see sections 4.3 and 4.5).

The combination of Kaletra with atorvastatin is not recommended. If the use of atorvastatin is considered strictly necessary, the lowest possible dose of atorvastatin should be administered with careful safety monitoring. Caution must also be exercised and reduced doses should be considered if Kaletra is used concurrently with rosuvastatin. If treatment with a HMG-CoA reductase inhibitor is indicated, pravastatin or fluvastatin is recommended (see section 4.5).

**PDE5 inhibitors:** particular caution should be used when prescribing sildenafil or tadalafil for the treatment of erectile dysfunction in patients receiving Kaletra. Co-administration of Kaletra with these medicinal products is expected to substantially increase their concentrations and may result in associated adverse events such as hypotension, syncope, visual changes and prolonged erection (see section 4.5). Concomitant use of vardenafil and lopinavir/ritonavir is contraindicated (see section 4.3). Concomitant use of sildenafil prescribed for the treatment of pulmonary arterial hypertension with Kaletra is contraindicated (see section 4.3).

Particular caution must be used when prescribing Kaletra and medicinal products known to induce QT interval prolongation such as: chlorpheniramine, quinidine, erythromycin, clarithromycin. Indeed, Kaletra could increase concentrations of the co-administered medicinal products and this may result in an increase of their associated cardiac adverse events. Cardiac events have been reported with Kaletra in preclinical studies; therefore, the potential cardiac effects of Kaletra cannot be currently ruled out (see sections 4.8 and 5.3).

Co-administration of Kaletra with rifampicin is not recommended. Rifampicin in combination with Kaletra causes large decreases in lopinavir concentrations which may in turn significantly decrease the lopinavir therapeutic effect. Adequate exposure to lopinavir/ritonavir may be achieved when a higher dose of Kaletra is used but this is associated with a higher risk of liver and gastrointestinal toxicity. Therefore, this co-administration should be avoided unless judged strictly necessary (see section 4.5).

**Other**

Kaletra is not a cure for HIV infection or AIDS. It does not reduce the risk of passing HIV to others through sexual contact or blood contamination. Appropriate precautions should be taken. People taking Kaletra may still develop infections or other illnesses associated with HIV disease and AIDS.

Concomitant use of Kaletra and fluticasone or other glucocorticoids that are metabolised by CYP3A4 is not recommended unless the potential benefit of treatment outweighs the risk of systemic corticosteroid effects, including Cushing’s syndrome and adrenal suppression (see section 4.5).

**4.5 Interaction with other medicinal products and other forms of interaction**

Kaletra contains lopinavir and ritonavir, both of which are inhibitors of the P450 isoform CYP3A. Co-administration of Kaletra and medicinal products primarily metabolised by CYP3A may result in increased plasma concentrations of the other medicinal product, which could increase or prolong its therapeutic and adverse reactions. Kaletra does not inhibit CYP2D6, CYP2C9, CYP2C19, CYP2E1, CYP2B6 or CYP1A2 at clinically relevant concentrations (see section 4.3).
Kaletra has been shown in vivo to induce its own metabolism and to increase the biotransformation of some medicinal products metabolised by cytochrome P450 enzymes (including CYP2C9 and CYP2C19) and by glucuronidation. This may result in lowered plasma concentrations and potential decrease of efficacy of co-administered medicinal products.

Medicinal products that are contraindicated specifically due to the expected magnitude of interaction and potential for serious adverse events are listed in section 4.3.

All interaction studies, when otherwise not stated, were performed using Kaletra capsules, which gives an approximately 20% lower exposure of lopinavir than the 200/50 mg tablets.

Known and theoretical interactions with selected antiretrovirals and non-antiretroviral medicinal products are listed in the table below.

**Interaction table**

Interactions between Kaletra and co-administered medicinal products are listed in the table below (increase is indicated as “↑”, decrease as “↓”, no change as “↔”, once daily as “QD”, twice daily as “BID” and three times daily as “TID”).

Unless otherwise stated, studies detailed below have been performed with the recommended dosage of lopinavir/ritonavir (i.e. 400/100 mg twice daily).

<table>
<thead>
<tr>
<th>Co-administered Drug by Therapeutic Area</th>
<th>Effects on drug levels</th>
<th>Clinical Recommendation Concerning Co-Administration with Kaletra</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antiretroviral Agents</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nucleoside/Nucleotide reverse transcriptase inhibitors (NRTIs)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stavudine, Lamivudine</td>
<td>Lopinavir: ↔</td>
<td>No dose adjustment necessary.</td>
</tr>
<tr>
<td>Abacavir, Zidovudine</td>
<td>Abacavir, Zidovudine:</td>
<td>The clinical significance of reduced abacavir and zidovudine concentrations is unknown.</td>
</tr>
<tr>
<td></td>
<td>Concentrations may be reduced due to increased glucuronidation by Kaletra.</td>
<td></td>
</tr>
<tr>
<td>Tenofovir, 300 mg QD</td>
<td>Tenofovir:</td>
<td>No dose adjustment necessary. Higher tenofovir concentrations could potentiate tenofovir associated adverse events, including renal disorders.</td>
</tr>
<tr>
<td></td>
<td>AUC: ↑ 32%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;max&lt;/sub&gt; : ↔</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;min&lt;/sub&gt; : ↑ 51%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lopinavir: ↔</td>
<td></td>
</tr>
<tr>
<td>Non-nucleoside reverse transcriptase inhibitors (NNRTIs)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efavirenz, 600 mg QD</td>
<td>Lopinavir:</td>
<td>The Kaletra tablets dosage should be increased to 500/125 mg twice daily when co-administered with efavirenz.</td>
</tr>
<tr>
<td></td>
<td>AUC: ↓ 20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;max&lt;/sub&gt; : ↓ 13%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C&lt;sub&gt;min&lt;/sub&gt; : ↓ 42%</td>
<td></td>
</tr>
<tr>
<td>Efavirenz, 600 mg QD (Lopinavir/ritonavir 500/125 mg BID)</td>
<td>Lopinavir: ↔ (Relative to 400/100 mg BID administered alone)</td>
<td>Kaletra must not be administered once daily in combination with efavirenz.</td>
</tr>
<tr>
<td>Nevirapine, 200 mg BID</td>
<td>Lopinavir:</td>
<td>The Kaletra tablets dosage should be increased to 500/125 mg twice daily when co-administered with nevirapine. Kaletra must not be administered once daily in combination with nevirapine.</td>
</tr>
<tr>
<td>------------------------</td>
<td>------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>AUC: ↓ 27%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{max}}$: ↓ 19%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{min}}$: ↓ 51%</td>
<td></td>
</tr>
</tbody>
</table>

**Co-administration with other HIV protease inhibitors (PIs)**
According to current treatment guidelines, dual therapy with protease inhibitors is generally not recommended.

<table>
<thead>
<tr>
<th>Fosamprenavir/ritonavir (700/100 mg BID)</th>
<th>Fosamprenavir: Amprenavir concentrations are significantly reduced.</th>
<th>Co-administration of increased doses of fosamprenavir (1400 mg BID) with lopinavir/ritonavir (533/133 mg BID) to protease inhibitor-experienced patients resulted in a higher incidence of gastrointestinal adverse events and elevations in triglycerides with the combination regimen without increases in virological efficacy, when compared with standard doses of fosamprenavir/ritonavir. Concomitant administration of these medicinal products is not recommended. Kaletra must not be administered once daily in combination with amprenavir.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Lopinavir/ritonavir 400/100 mg BID)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fosamprenavir (1400 mg BID)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Lopinavir/ritonavir 533/133 mg BID)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indinavir, 600 mg BID</th>
<th>Indinavir:</th>
<th>The appropriate doses for this combination, with respect to efficacy and safety, have not been established.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AUC: ↔</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{min}}$: ↑ 3.5-fold</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{max}}$: ↓ (relative to indinavir 800 mg TID alone)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lopinavir: ↔ (relative to historical comparison)</td>
<td></td>
</tr>
</tbody>
</table>

| Nelfinavir                             | Lopinavir: Concentrations ↓ | The appropriate doses for this combination, with respect to efficacy and safety, have not been established. |
|                                        |                        |                                                                                                 |

<table>
<thead>
<tr>
<th>Saquinavir 1000 mg BID</th>
<th>Saquinavir: ↔</th>
<th>No dose adjustment necessary.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Tipranavir/ritonavir (500/100 mg BID)</th>
<th>Lopinavir:</th>
<th>Concomitant administration of these medicinal products is not recommended.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AUC: ↓ 55%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{min}}$: ↓ 47%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$C_{\text{max}}$: ↓ 70%</td>
<td></td>
</tr>
</tbody>
</table>

**Acid reducing agents**

<table>
<thead>
<tr>
<th>Omeprazole (40 mg QD)</th>
<th>Omeprazole: ↔</th>
<th>No dose adjustment necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lopinavir:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ranitidine (150 mg single dose)</th>
<th>Ranitidine: ↔</th>
<th>No dose adjustment necessary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analgesics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Fentanyl</td>
<td>Increased risk of side-effects (respiratory depression, sedation) due to higher plasma concentrations because of CYP3A4 inhibition by Kaletra</td>
<td>Careful monitoring of adverse effects (notably respiratory depression but also sedation) is recommended when fentanyl is concomitantly administered with Kaletra.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antiarrhythmics</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Digoxin</td>
<td>Plasma concentrations may be increased due to P-glycoprotein inhibition by Kaletra. The increased digoxin level may lessen over time as Pgp induction develops.</td>
<td>Caution is warranted and therapeutic drug monitoring of digoxin concentrations, if available, is recommended in case of co-administration of Kaletra and digoxin. Particular caution should be used when prescribing Kaletra in patients taking digoxin as the acute inhibitory effect of ritonavir on Pgp is expected to significantly increase digoxin levels. Initiation of digoxin in patients already taking Kaletra is likely to result in lower than expected increases of digoxin concentrations.</td>
<td></td>
</tr>
</tbody>
</table>

|  | Bepridil, Systemic Lidocaine, Quinidine | Bepridil, Systemic Lidocaine, Quinidine: Concentrations may be increased when co-administered with Kaletra. | Caution is warranted and therapeutic drug concentration monitoring is recommended when available. |

<table>
<thead>
<tr>
<th>Antibiotics</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarithromycin</td>
<td>Moderate increases in clarithromycin AUC are expected due to CYP3A inhibition by Kaletra.</td>
<td>For patients with renal impairment (CrCL &lt;30 ml/min) dose reduction of clarithromycin should be considered (see section 4.4). Caution should be exercised in administering clarithromycin with Kaletra to patients with impaired hepatic or renal function.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anticancer agents</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Most tyrosine kinase inhibitors such as dasatinib and nilotinib, Vincristine, Vinblastine</td>
<td>Risk of increased adverse events due to higher serum concentrations because of CYP3A4 inhibition by Kaletra.</td>
<td>Careful monitoring of the tolerance of these anticancer agents.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anticoagulants</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Warfarin</td>
<td>Concentrations may be affected when co-administered with Kaletra due to CYP2C9 induction.</td>
<td>It is recommended that INR (international normalised ratio) be monitored.</td>
<td></td>
</tr>
</tbody>
</table>
### Anticonvulsants

<table>
<thead>
<tr>
<th>Drug</th>
<th>Notes</th>
</tr>
</thead>
</table>
| **Phenytoin** | Steady-state concentrations was moderately decreased due to CYP2C9 and CYP2C19 induction by Kaletra.  
Lopinavir: Concentrations are decreased due to CYP3A induction by phenytoin. |
| **Kaletra** | Steady-state concentrations was moderately decreased due to CYP2C9 and CYP2C19 induction by Kaletra.  
Phenytoin levels should be monitored when co-administering with lopinavir/ritonavir.  
When co-administered with phenytoin, an increase of Kaletra dosage may be envisaged.  
Dose adjustment has not been evaluated in clinical practice.  
Kaletra must not be administered once daily in combination with phenytoin. |

### Carbamazepine and Phenobarbital

<table>
<thead>
<tr>
<th>Drug</th>
<th>Notes</th>
</tr>
</thead>
</table>
| **Carbamazepine** | Serum concentrations may be increased due to CYP3A inhibition by Kaletra.  
Lopinavir: Concentrations may be decreased due to CYP3A induction by carbamazepine and phenobarbital. |
| **Kaletra** | Serum concentrations may be increased due to CYP3A inhibition by Kaletra.  
Carbamazepine and phenobarbital levels should be monitored when co-administering with lopinavir/ritonavir.  
When co-administered with carbamazepine or phenobarbital, an increase of Kaletra dosage may be envisaged.  
Dose adjustment has not been evaluated in clinical practice.  
Kaletra must not be administered once daily in combination with cabamazepine and phenobarbital. |

### Antidepressants and Anxiolytics

<table>
<thead>
<tr>
<th>Drug</th>
<th>Notes</th>
</tr>
</thead>
</table>
| **Trazodone single dose (Ritonavir, 200 mg BID)** | Trazodone:  
AUC: ↑ 2.4-fold  
Adverse events of nausea, dizziness, hypotension and syncope were observed following co-administration of trazodone and ritonavir. |
| **Kaletra** | It is unknown whether the combination of lopinavir/ritonavir causes a similar increase in trazodone exposure.  
The combination should be used with caution and a lower dose of trazodone should be considered. |

### Antifungals

<table>
<thead>
<tr>
<th>Drug</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ketoconazole and Itraconazole</strong></td>
<td>Ketoconazole, Itraconazole: Serum concentrations may be increased due to CYP3A inhibition by Kaletra.</td>
</tr>
<tr>
<td><strong>Voriconazole</strong></td>
<td>Voriconazole: Concentrations may be decreased.</td>
</tr>
</tbody>
</table>
| **Kaletra** | High doses of ketoconazole and itraconazole (> 200 mg/day) are not recommended.  
Co-administration of voriconazole and low dose ritonavir (100 mg BID) as contained in Kaletra should be avoided unless an assessment of the benefit/risk to patient justifies the use of voriconazole. |
### Antimycobacterials

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rifabutin, 150 mg QD</td>
<td>Rifabutin (parent drug and active 25-O-desacetyl metabolite): AUC: ↑ 5.7-fold Cmax: ↑ 3.5-fold</td>
<td>On the basis of these data, a rifabutin dose reduction of 75% (i.e. 150 mg every other day or 3 times per week) is recommended when administered with Kaletra. Further reduction may be necessary.</td>
</tr>
<tr>
<td>Rifampicin</td>
<td>Lopinavir: Large decreases in lopinavir concentrations may be observed due to CYP3A induction by rifampicin.</td>
<td>Co-administration of Kaletra with rifampicin is not recommended as the decrease in lopinavir concentrations may in turn significantly decrease the lopinavir therapeutic effect. A dose adjustment of Kaletra 400 mg/400 mg (i.e. Kaletra 400/100 mg + ritonavir 300 mg) twice daily has allowed compensating for the CYP 3A4 inducer effect of rifampicin. However, such a dose adjustment might be associated with ALT/AST elevations and with increase in gastrointestinal disorders. Therefore, this co-administration should be avoided unless judged strictly necessary. If this co-administration is judged unavoidable, increased dose of Kaletra at 400 mg/400 mg twice daily may be administered with rifampicin under close safety and therapeutic drug monitoring. The Kaletra dose should be titrated upward only after rifampicin has been initiated (see section 4.4).</td>
</tr>
</tbody>
</table>

### Benzodiazepines

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midazolam</td>
<td>Oral Midazolam: AUC: ↑ 13-fold Parenteral Midazolam: AUC: ↑ 4-fold</td>
<td>Kaletra must not be co-administered with oral midazolam (see section 4.3), whereas caution should be used with co-administration of Kaletra and parenteral midazolam. If Kaletra is co-administered with parenteral midazolam, it should be done in an intensive care unit (ICU) or similar setting which ensures close clinical monitoring and appropriate medical management in case of respiratory depression and/or prolonged sedation. Dosage adjustment for midazolam should be considered especially if more than a single dose of midazolam</td>
</tr>
<tr>
<td></td>
<td>Due to CYP3A inhibition by Kaletra</td>
<td></td>
</tr>
</tbody>
</table>

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84
<table>
<thead>
<tr>
<th>Calcium channel blockers</th>
<th>Calcium channel blockers</th>
<th>Calcium channel blockers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felodipine, Nifedipine, and Nicardipine</td>
<td>Felodipine, Nifedipine, Nicardipine: Concentrations may be increased due to CYP3A inhibition by Kaletra.</td>
<td>Clinical monitoring of therapeutic and adverse effects is recommended when these medicines are concomitantly administered with Kaletra.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Corticosteroids</th>
<th>Corticosteroids</th>
<th>Corticosteroids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexamethasone</td>
<td>Lopinavir: Concentrations may be decreased due to CYP3A induction by dexamethasone.</td>
<td>Clinical monitoring of antiviral efficacy is recommended when these medicines are concomitantly administered with Kaletra.</td>
</tr>
<tr>
<td>Fluticasone propionate, 50 μg intranasal 4 times daily (100 mg ritonavir BID)</td>
<td>Fluticasone propionate: Plasma concentrations ↑ Cortisol levels ↓ 86%</td>
<td>Greater effects may be expected when fluticasone propionate is inhaled. Systemic corticosteroid effects including Cushing's syndrome and adrenal suppression have been reported in patients receiving ritonavir and inhaled or intranasally administered fluticasone propionate; this could also occur with other corticosteroids metabolised via the P450 3A pathway eg budesonide. Consequently, concomitant administration of Kaletra and these glucocorticoids is not recommended unless the potential benefit of treatment outweighs the risk of systemic corticosteroid effects (see section 4.4). A dose reduction of the glucocorticoid should be considered with close monitoring of local and systemic effects or a switch to a glucocorticoid, which is not a substrate for CYP3A4 (eg beclomethasone). Moreover, in case of withdrawal of glucocorticoids progressive dose reduction may have to be performed over a longer period.</td>
</tr>
<tr>
<td><strong>Erectile Dysfunction, Phosphodiesterase(PDE5) inhibitors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
</tr>
</tbody>
</table>
| **Tadalafil** | Tadalafil:  
AUC: ↑ 2-fold  
Due to CYP3A inhibition by Kaletra. | Particular caution must be used when prescribing sildenafil or tadalafil in patients receiving Kaletra with increased monitoring for adverse events including hypotension, syncope, visual changes and prolonged erection (see section 4.4).  
When co-administered with Kaletra, sildenafil doses must not exceed 25 mg in 48 hours and tadalafil doses must not exceed 10 mg every 72 hours.  
Co-administration of Kaletra with sildenafil used for the treatment of pulmonary arterial hypertension is contra-indicated (see section 4.3). |
| **Sildenafil** | Sildenafil:  
AUC: ↑ 11-fold  
Due to CYP3A inhibition by Kaletra. |  |
| **Vardenafil** | Vardenafil:  
AUC: ↑ 49-fold  
Due to CYP3A inhibition by Kaletra. | The use of vardenafil with Kaletra is contra-indicated (see section 4.3). |

**Herbal products**

| St John’s wort  
(*Hypericum perforatum*) | Lopinavir:  
Concentrations may be reduced due to induction of CYP3A by the herbal preparation St John’s wort. | Herbal preparations containing St John’s wort must not be combined with lopinavir and ritonavir. If a patient is already taking St John’s wort, stop St John’s wort and if possible check viral levels. Lopinavir and ritonavir levels may increase on stopping St John’s wort. The dose of Kaletra may need adjusting. The inducing effect may persist for at least 2 weeks after cessation of treatment with St John’s wort (see section 4.3). Therefore, Kaletra can be started safely 2 weeks after cessation of St John’s wort. |

**Immunosuppressants**

| Cyclosporin, Sirolimus  
(rapamycin), and Tacrolimus | Cyclosporin, Sirolimus  
(rapamycin), Tacrolimus:  
Concentrations may be increased due to CYP3A inhibition by Kaletra. | More frequent therapeutic concentration monitoring is recommended until plasma levels of these products have been stabilised. |

**Lipid lowering agents**

| Lovastatin and Simvastatin | Lovastatin, Simvastatin:  
Markedly increased plasma concentrations due to CYP3A inhibition by Kaletra. | Since increased concentrations of HMG-CoA reductase inhibitors may cause myopathy, including rhabdomyolysis, the combination of these agents with Kaletra is contra-indicated (see section 4.3). |
### Atorvastatin

**Atorvastatin:**
- AUC: $\uparrow$ 5.9-fold
- $C_{\text{max}}$: $\uparrow$ 4.7-fold

*Due to CYP3A inhibition by Kaletra.*

The combination of Kaletra with atorvastatin is not recommended. If the use of atorvastatin is considered strictly necessary, the lowest possible dose of atorvastatin should be administered with careful safety monitoring (see section 4.4).

---

### Rosuvastatin, 20 mg QD

**Rosuvastatin:**
- AUC: $\uparrow$ 2-fold
- $C_{\text{max}}$: $\uparrow$ 5-fold

While rosuvastatin is poorly metabolised by CYP3A4, an increase of its plasma concentrations was observed. The mechanism of this interaction may result from inhibition of transport proteins.

Caution should be exercised and reduced doses should be considered when Kaletra is co-administered with rosuvastatin (see section 4.4).

---

### Fluvastatin or Pravastatin

**Fluvastatin, Pravastatin:**
- No clinical relevant interaction expected.

Pravastatin is not metabolised by CYP450.

Fluvastatin is partially metabolised by CYP2C9.

If treatment with an HMG-CoA reductase inhibitor is indicated, fluvastatin or pravastatin is recommended.

---

### Opioids

**Buprenorphine, 16 mg QD**

Buprenorphine: $\leftrightarrow$

No dose adjustment necessary.

---

**Methadone**

Methadone: $\downarrow$

Monitoring plasma concentrations of methadone is recommended.

---

### Oral Contraceptives

**Ethinyl Oestradiol**

Ethinyl Oestradiol: $\downarrow$

In case of co-administration of Kaletra with contraceptives containing ethinyl oestradiol (whatever the contraceptive formulation e.g. oral or patch), additional methods of contraception must be used.

---

### Smoking cessation aids

**Bupropion**

Bupropion and its active metabolite, hydroxybupropion:
- AUC and $C_{\text{max}}$ $\downarrow$ ~50%

This effect may be due to induction of bupropion metabolism.

If the co-administration of lopinavir/ritonavir with bupropion is judged unavoidable, this should be done under close clinical monitoring for bupropion efficacy, without exceeding the recommended dosage, despite the observed induction.

---

Other medicinal products

Based on known metabolic profiles, clinically significant interactions are not expected between Kaletra and dapsone, trimethoprim/sulfamethoxazole, azithromycin or fluconazole.

### 4.6 Pregnancy and lactation

There are no data from the use of Kaletra in pregnant women. Studies in animals have shown reproductive toxicity (see section 5.3). The potential risk for humans is unknown. Kaletra should not be used during pregnancy unless clearly necessary.
Studies in rats revealed that lopinavir is excreted in the milk. It is not known whether this medicinal product is excreted in human milk. HIV infected women must not breast-feed their infants under any circumstances to avoid transmission of HIV.

4.7 Effects on ability to drive and use machines

No studies on the effects on the ability to drive and use machines have been performed. Patients should be informed that nausea has been reported during treatment with Kaletra (see section 4.8).

4.8 Undesirable effects

a. Summary of the safety profile

The safety of Kaletra has been investigated in over 2600 patients in Phase II-IV clinical trials, of which over 700 have received a dose of 800/200 mg (6 capsules or 4 tablets) once daily. Along with nucleoside reverse transcriptase inhibitors (NRTIs), in some studies, Kaletra was used in combination with efavirenz or nevirapine.

The most common adverse reactions related to Kaletra therapy during clinical trials were diarrhoea, nausea, vomiting, hypertriglyceridaemia and hypercholesterolemia. The risk of diarrhoea may be greater with once daily dosing of Kaletra. Diarrhoea, nausea and vomiting may occur at the beginning of the treatment while hypertriglyceridaemia and hypercholesterolemia may occur later. Treatment emergent adverse events led to premature study discontinuation for 7% of subjects from Phase II-IV studies.

It is important to note that cases of pancreatitis have been reported in patients receiving Kaletra, including those who developed hypertriglyceridaemia. Furthermore, rare increases in PR interval have been reported during Kaletra therapy (see section 4.4: sections pancreatitis and lipid elevations).

b. Tabulated list of adverse reactions

Adverse reactions from clinical trials and post-marketing experience in adult and paediatric patients:

The safety of Kaletra has been investigated in over 2600 patients in Phase II-IV clinical trials, of which over 700 have received a dose of 800/200 mg (6 capsules or 4 tablets) once daily. Along with NRTIs, in some studies, Kaletra was used in combination with efavirenz or nevirapine.

The following events have been identified as adverse reactions. The frequency category includes all reported events of moderate to severe intensity, regardless of the individual causality assessment. The adverse reactions are displayed by system organ class. Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness: very common (≥ 1/10), common (≥ 1/100 to < 1/10) and uncommon (≥ 1/1000 to < 1/100).

Events noted as having frequency “Not known” were identified via post-marketing surveillance.
<table>
<thead>
<tr>
<th>System organ class</th>
<th>Frequency</th>
<th>Adverse reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections and infestations</td>
<td>Very common</td>
<td>Upper respiratory tract infection</td>
</tr>
<tr>
<td></td>
<td>Common</td>
<td>Lower respiratory tract infection, skin infections including cellulitis, folliculitis and furuncle</td>
</tr>
<tr>
<td>Blood and lymphatic system disorders</td>
<td>Common</td>
<td>Anaemia, leucopenia, neutropenia, lymphadenopathy</td>
</tr>
<tr>
<td>Immune system disorders</td>
<td>Common</td>
<td>Hypersensitivity including urticaria and angioedema</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Immune reconstitution syndrome</td>
</tr>
<tr>
<td>Endocrine disorders</td>
<td>Uncommon</td>
<td>Hypogonadism</td>
</tr>
<tr>
<td>Metabolism and nutrition disorders</td>
<td>Common</td>
<td>Blood glucose disorders including diabetes mellitus, hypertriglyceridaemia, hypercholesterolemia, weight decreased, decreased appetite</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Weight increased, increased appetite</td>
</tr>
<tr>
<td>Psychiatric disorders</td>
<td>Common</td>
<td>Anxiety</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Abnormal dreams, libido decreased</td>
</tr>
<tr>
<td>Nervous system disorders</td>
<td>Common</td>
<td>Headache (including migraine), neuropathy (including peripheral neuropathy), dizziness, insomnia</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Cerebrovascular accident, convulsion, dysgeusia, ageusia, tremor</td>
</tr>
<tr>
<td>Eye disorders</td>
<td>Uncommon</td>
<td>Visual impairment</td>
</tr>
<tr>
<td>Ear and labyrinth disorders</td>
<td>Uncommon</td>
<td>Tinnitus, vertigo</td>
</tr>
<tr>
<td>Cardiac disorders</td>
<td>Uncommon</td>
<td>Atherosclerosis such as myocardial infarction, atrioventricular block, tricuspid valve incompetence</td>
</tr>
<tr>
<td>Vascular disorders</td>
<td>Common</td>
<td>Hypertension</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Deep vein thrombosis</td>
</tr>
<tr>
<td>Gastrointestinal disorders</td>
<td>Very common</td>
<td>Diarrhoea, nausea</td>
</tr>
<tr>
<td></td>
<td>Common</td>
<td>Pancreatitis, vomiting, gastrooesophageal reflux disease, gastroenteritis and colitis, abdominal pain (upper and lower), abdominal distension, dyspepsia, haemorrhoids, flatulence</td>
</tr>
<tr>
<td></td>
<td>Uncommon</td>
<td>Gastrointestinal haemorrhage including gastrointestinal ulcer, duodenitis, gastritis and rectal haemorrhage, stomatitis and oral ulcers, faecal incontinence, constipation, dry mouth</td>
</tr>
</tbody>
</table>
**Hepatobiliary disorders**

| Common          | Hepatitis including AST, ALT and GGT increases |
| Uncommon        | Hepatic steatosis, hepatomegaly, cholangitis, hyperbilirubinemia |
| Not known       | Jaundice |

**Skin and subcutaneous tissue disorders**

| Common          | Lipodystrophy acquired including facial wasting, rash including maculopapular rash, dermatitis/rash including eczema and seborrheic dermatitis, night sweats, pruritis |
| Uncommon        | Alopecia, capillaritis, vasculitis |
| Not known       | Stevens-Johnson syndrome, erythema multiforme |

**Musculoskeletal and connective tissue disorders**

| Common          | Myalgia, musculoskeletal pain including arthralgia and back pain, muscle disorders such as weakness and spasms |
| Uncommon        | Rhabdomyolysis, osteonecrosis |

**Renal and urinary disorders**

| Uncommon        | Creatinine clearance decreased, nephritis, haematuria |

**Reproductive system and breast disorders**

| Common          | Erectile dysfunction, menstrual disorders - amenorrhoea, menorrhagia |

**General disorders and administration site conditions**

| Common          | Fatigue including asthenia |

*See section 4.4: pancreatitis and lipids*

c. **Description of selected adverse reactions**

Cushing’s syndrome has been reported in patients receiving ritonavir and inhaled or intranasally administered fluticasone propionate; this could also occur with other corticosteroids metabolised via the P450 3A pathway e.g. budesonide (see section 4.4 and 4.5).

Increased CPK, myalgia, myositis, and rarely, rhabdomyolysis have been reported with protease inhibitors, particularly in combination with nucleoside reverse transcriptase inhibitors.

Combination antiretroviral therapy has been associated with redistribution of body fat (lipodystrophy) in HIV patients including the loss of peripheral and facial subcutaneous fat, increased intra-abdominal and visceral fat, breast hypertrophy and dorsocervical fat accumulation (buffalo hump).

Combination antiretroviral therapy has been associated with metabolic abnormalities such as hypertriglyceridaemia, hypercholesterolaemia, insulin resistance, hyperglycaemia and hyperlactataemia (see section 4.4).

In HIV-infected patients with severe immune deficiency at the time of initiation of combination antiretroviral therapy (CART), an inflammatory reaction to asymptomatic or residual opportunistic infections may arise (see section 4.4).

Cases of osteonecrosis have been reported, particularly in patients with generally acknowledged risk factors, advanced HIV disease or long-term exposure to combination antiretroviral therapy (CART). The frequency of this is unknown (see section 4.4).
d. Paediatric populations

In children 2 years of age and older, the nature of the safety profile is similar to that seen in adults (see Table in section b).

4.9 Overdose

To date, there is limited human experience of acute overdose with Kaletra.

The adverse clinical signs observed in dogs included salivation, emesis and diarrhoea/abnormal stool. The signs of toxicity observed in mice, rats or dogs included decreased activity, ataxia, emaciation, dehydration and tremors.

There is no specific antidote for overdose with Kaletra. Treatment of overdose with Kaletra is to consist of general supportive measures including monitoring of vital signs and observation of the clinical status of the patient. If indicated, elimination of unabsorbed active substance is to be achieved by emesis or gastric lavage. Administration of activated charcoal may also be used to aid in removal of unabsorbed active substance. Since Kaletra is highly protein bound, dialysis is unlikely to be beneficial in significant removal of the active substance.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmaco-therapeutic group: protease inhibitor, ATC code: J05AE06

**Mechanism of action:** lopinavir provides the antiviral activity of Kaletra. Lopinavir is an inhibitor of the HIV-1 and HIV-2 proteases. Inhibition of HIV protease prevents cleavage of the gag-pol polyprotein resulting in the production of immature, non-infectious virus.

**Effects on the electrocardiogram:** QTcF interval was evaluated in a randomised, placebo and active (moxifloxacin 400 mg once daily) controlled crossover study in 39 healthy adults, with 10 measurements over 12 hours on Day 3. The maximum mean (95% upper confidence bound) differences in QTcF from placebo were 3.6 (6.3) and 13.1(15.8) for 400/100 mg twice daily and supratherapeutic 800/200 mg twice daily LPV/r, respectively. The induced QRS interval prolongation from 6 ms to 9.5 ms with high dose lopinavir/ritonavir (800/200 mg twice daily) contributes to QT prolongation. The two regimens resulted in exposures on Day 3 which were approximately 1.5 and 3-fold higher than those observed with recommended once daily or twice daily LPV/r doses at steady state. No subject experienced an increase in QTcF of ≥ 60 msec from baseline or a QTcF interval exceeding the potentially clinically relevant threshold of 500 msec.

Modest prolongation of the PR interval was also noted in subjects receiving lopinavir/ritonavir in the same study on Day 3. The mean changes from baseline in PR interval ranged from 11.6 ms to 24.4 ms in the 12 hour interval post dose. Maximum PR interval was 286 msec and no second or third degree heart block was observed (see section 4.4).

**Antiviral activity in vitro:** the in vitro antiviral activity of lopinavir against laboratory and clinical HIV strains was evaluated in acutely infected lymphoblastic cell lines and peripheral blood lymphocytes, respectively. In the absence of human serum, the mean IC$_{50}$ of lopinavir against five different HIV-1 laboratory strains was 19 nM. In the absence and presence of 50% human serum, the mean IC$_{50}$ of lopinavir against HIV-1$_{HIV}$ in MT4 cells was 17 nM and 102 nM, respectively. In the absence of human serum, the mean IC$_{50}$ of lopinavir was 6.5 nM against several HIV-1 clinical isolates.
Resistance

In vitro selection of resistance:

HIV-1 isolates with reduced susceptibility to lopinavir have been selected in vitro. HIV-1 has been passaged in vitro with lopinavir alone and with lopinavir plus ritonavir at concentration ratios representing the range of plasma concentration ratios observed during Kaletra therapy. Genotypic and phenotypic analysis of viruses selected in these passages suggest that the presence of ritonavir, at these concentration ratios, does not measurably influence the selection of lopinavir-resistant viruses. Overall, the in vitro characterisation of phenotypic cross-resistance between lopinavir and other protease inhibitors suggest that decreased susceptibility to lopinavir correlated closely with decreased susceptibility to ritonavir and indinavir, but did not correlate closely with decreased susceptibility to amprenavir, saquinavir, and nelfinavir.

Analysis of resistance in ARV-naïve patients:

In clinical studies with a limited number of isolates analysed, the selection of resistance to lopinavir has not been observed in naïve patients without significant protease inhibitor resistance at baseline. See further the detailed description of the clinical studies.

Analysis of resistance in PI-experienced patients:

The selection of resistance to lopinavir in patients having failed prior protease inhibitor therapy was characterised by analysing the longitudinal isolates from 19 protease inhibitor-experienced subjects in 2 Phase II and one Phase III studies who either experienced incomplete virologic suppression or viral rebound subsequent to initial response to Kaletra and who demonstrated incremental in vitro resistance between baseline and rebound (defined as emergence of new mutations or 2-fold change in phenotypic susceptibility to lopinavir). Incremental resistance was most common in subjects whose baseline isolates had several protease inhibitor-associated mutations, but < 40-fold reduced susceptibility to lopinavir at baseline. Mutations V82A, I54V and M46I emerged most frequently. Mutations L33F, I50V and V32I combined with I47V/A were also observed. The 19 isolates demonstrated a 4.3-fold increase in IC50 compared to baseline isolates (from 6.2- to 43-fold, compared to wild-type virus).

Genotypic correlates of reduced phenotypic susceptibility to lopinavir in viruses selected by other protease inhibitors. The in vitro antiviral activity of lopinavir against 112 clinical isolates taken from patients failing therapy with one or more protease inhibitors was assessed. Within this panel, the following mutations in HIV protease were associated with reduced in vitro susceptibility to lopinavir: L10F/I/R/V, K20M/R, L24I, M46I/L, F53L, I54L/T/V, L63P, A71I/L/T/V, V82A/F/T, I84V and L90M. The median EC50 of lopinavir against isolates with 0 – 3, 4 – 5, 6 – 7 and 8 – 10 mutations at the above amino acid positions was 0.8, 2.7 13.5 and 44.0-fold higher than the EC50 against wild type HIV, respectively. The 16 viruses that displayed > 20-fold change in susceptibility all contained mutations at positions 10, 54, 63 plus 82 and/or 84. In addition, they contained a median of 3 mutations at amino acid positions 20, 24, 46, 53, 71 and 90. In addition to the mutations described above, mutations V32I and I47A have been observed in rebound isolates with reduced lopinavir susceptibility from protease inhibitor experienced patients receiving Kaletra therapy, and mutations I47A and L76V have been observed in rebound isolates with reduced lopinavir susceptibility from patients receiving Kaletra therapy.

Conclusions regarding the relevance of particular mutations or mutational patterns are subject to change with additional data, and it is recommended to always consult current interpretation systems for analysing resistance test results.

Antiviral activity of Kaletra in patients failing protease inhibitor therapy: the clinical relevance of reduced in vitro susceptibility to lopinavir has been examined by assessing the virologic response to Kaletra therapy, with respect to baseline viral genotype and phenotype, in 56 patients previous failing therapy with multiple protease inhibitors. The EC50 of lopinavir against the 56 baseline viral isolates ranged from 0.6 to 96-fold higher than the EC50 against wild type HIV. After 48 weeks of treatment
with Kaletra, efavirenz and nucleoside reverse transcriptase inhibitors, plasma HIV RNA ≤ 400 copies/ml was observed in 93% (25/27), 73% (11/15), and 25% (2/8) of patients with < 10-fold, 10 to 40-fold, and > 40-fold reduced susceptibility to lopinavir at baseline, respectively. In addition, virologic response was observed in 91% (21/23), 71% (15/21) and 33% (2/6) patients with 0 – 5, 6 – 7, and 8 – 10 mutations of the above mutations in HIV protease associated with reduced *in vitro* susceptibility to lopinavir. Since these patients had not previously been exposed to either Kaletra or efavirenz, part of the response may be attributed to the antiviral activity of efavirenz, particularly in patients harbouring highly lopinavir resistant virus. The study did not contain a control arm of patients not receiving Kaletra.

**Cross-resistance:** Activity of other protease inhibitors against isolates that developed incremental resistance to lopinavir after Kaletra therapy in protease inhibitor experienced patients: The presence of cross resistance to other protease inhibitors was analysed in 18 rebound isolates that had demonstrated evolution of resistance to lopinavir during 3 Phase II and one Phase III studies of Kaletra in protease inhibitor-experienced patients. The median fold IC₅₀ of lopinavir for these 18 isolates at baseline and rebound was 6.9- and 63-fold, respectively, compared to wild type virus. In general, rebound isolates either retained (if cross-resistant at baseline) or developed significant cross-resistance to indinavir, saquinavir and atazanavir. Modest decreases in amprenavir activity were noted with a median increase of IC₅₀ from 3.7- to 8-fold in the baseline and rebound isolates, respectively. Isolates retained susceptibility to tipranavir with a median increase of IC₅₀ in baseline and rebound isolates of 1.9- and 1.8–fold, respectively, compared to wild type virus. Please refer to the Aptivus Summary of Product Characteristics for additional information on the use of tipranavir, including genotypic predictors of response, in treatment of lopinavir-resistant HIV-1 infection.

**Clinical results**

The effects of Kaletra (in combination with other antiretroviral agents) on biological markers (plasma HIV RNA levels and CD4+ T-cell counts) have been investigated in a controlled studies of Kaletra of 48 to 360 weeks duration.

**Adult Use**

Patients without prior antiretroviral therapy

Study M98-863 was a randomised, double-blind trial of 653 antiretroviral treatment naïve patients investigating Kaletra (400/100 mg twice daily) compared to nelfinavir (750 mg three times daily) plus stavudine and lamivudine. Mean baseline CD4+ T-cell count was 259 cells/mm³ (range: 2 to 949 cells/ mm³) and mean baseline plasma HIV-1 RNA was 4.9 log₁₀ copies/ml (range: 2.6 to 6.8 log₁₀ copies/ml).

Table 1

<table>
<thead>
<tr>
<th>Outcomes at Week 48: Study M98-863</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
<td>HIV RNA &lt; 400 copies/ml*</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml†</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+T-cell count (cells/mm³)</td>
</tr>
</tbody>
</table>

* intent to treat analysis where patients with missing values are considered virologic failures
† p<0.001

One-hundred thirteen nelfinavir-treated patients and 74 lopinavir/ritonavir-treated patients had an HIV RNA above 400 copies/ml while on treatment from Week 24 through Week 96. Of these, isolates from 96 nelfinavir-treated patients and 51 lopinavir/ritonavir-treated patients could be amplified for resistance testing. Resistance to nelfinavir, defined as the presence of the D30N or L90M mutation in protease, was observed in 41/96 (43%) patients. Resistance to lopinavir, defined as the presence of...
any primary or active site mutations in protease (see above), was observed in 0/51 (0%) patients. Lack of resistance to lopinavir was confirmed by phenotypic analysis.

Study M05-730 was a randomised, open-label, multicentre trial comparing treatment with Kaletra 800/200 mg once daily plus tenofovir DF and emtricitabine versus Kaletra 400/100 mg twice daily plus tenofovir DF and emtricitabine in 664 antiretroviral treatment-naive patients. Given the pharmacokinetic interaction between Kaletra and tenofovir (see section 4.5), the results of this study might not be strictly extrapolable when other backbone regimens are used with Kaletra. Patients were randomised in a 1:1 ratio to receive either Kaletra 800/200 mg once daily (n = 333) or Kaletra 400/100 mg twice daily (n = 331). Further stratification within each group was 1:1 (tablet versus. soft capsule). Patients were administered either the tablet or the soft capsule formulation for 8 weeks, after which all patients were administered the tablet formulation once daily or twice daily for the remainder of the study. Patients were administered emtricitabine 200 mg once daily and tenofovir DF 300 mg once daily. Protocol defined non-inferiority of once daily dosing compared with twice daily dosing was demonstrated if the lower bound of the 95% confidence interval for the difference in proportion of subjects responding (once daily minus twice daily) excluded -12% at Week 48. Mean age of patients enrolled was 39 years (range: 19 to 71); 75% were Caucasian, and 78% were male. Mean baseline CD4+ T-cell count was 216 cells/mm³ (range: 20 to 775 cells/mm³) and mean baseline plasma HIV-1 RNA was 5.0 log₁₀ copies/ml (range: 1.7 to 7.0 log₁₀ copies/ml).

Table 2

| Virologic Response of Study Subjects at Week 48 and Week 96 | Week 48 | | Week 96 |
|---|---|---|---|---|---|
| | QD | BID | Difference [95% CI] | QD | BID | Difference [95% CI] |
| NC= Failure | 257/333 (77.2%) | 251/331 (75.8%) | 1.3% [-5.1, 7.8] | 216/333 (64.9%) | 229/331 (69.2%) | -4.3% [-11.5, 2.8] |
| Observed data | 257/295 (87.1%) | 250/280 (89.3%) | -2.2% [-7.4, 3.1] | 216/247 (87.4%) | 229/248 (92.3%) | -4.9% [-10.2, 0.4] |
| Mean increase from baseline in CD4+ T-cell count (cells/mm³) | 186 | 198 | 238 | 254 |

Through Week 96, genotypic resistance testing results were available from 25 patients in the QD group and 26 patients in the BID group who had incomplete virologic response. In the QD group, no patient demonstrated lopinavir resistance, and in the BID group, 1 patient who had significant protease inhibitor resistance at baseline demonstrated additional lopinavir resistance on study.

Sustained virological response to Kaletra (in combination with nucleoside/nucleotide reverse transcriptase inhibitors) has been also observed in a small Phase II study (M97-720) through 360 weeks of treatment. One hundred patients were originally treated with Kaletra in the study (including 51 patients receiving 400/100 mg twice daily and 49 patients at either 200/100 mg twice daily or 400/200 mg twice daily). All patients converted to open-label Kaletra at the 400/100 mg twice daily dose between week 48 and week 72. Thirty-nine patients (39%) discontinued the study, including 16 (16%) discontinuations due to adverse events, one of which was associated with a death. Sixty-one patients completed the study (35 patients received the recommended 400/100 mg twice daily dose throughout the study).
Table 3

<table>
<thead>
<tr>
<th>Outcomes at Week 360: Study M97-720</th>
<th>Kaletra (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV RNA &lt; 400 copies/ml</td>
<td>61%</td>
</tr>
<tr>
<td>HIV RNA &lt; 50 copies/ml</td>
<td>59%</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
<td>501</td>
</tr>
</tbody>
</table>

Through 360 weeks of treatment, genotypic analysis of viral isolates was successfully conducted in 19 of 28 patients with confirmed HIV RNA above 400 copies/ml revealed no primary or active site mutations in protease (amino acids at positions 8, 30, 32, 46, 47, 48, 50, 82, 84 and 90) or protease inhibitor phenotypic resistance.

**Patients with prior antiretroviral therapy**

M06-802 was a randomised open-label study comparing the safety, tolerability and antiviral activity of once daily and twice daily dosing of lopinavir/ritonavir tablets in 599 subjects with detectable viral loads while receiving their current antiviral therapy. Patients had not been on prior lopinavir/ritonavir therapy. They were randomised in a 1:1 ratio to receive either lopinavir/ritonavir 800/200 mg once daily (n = 300) or lopinavir/ritonavir 400/100 mg twice daily (n = 299). Patients were administered at least two nucleoside/nucleotide reverse transcriptase inhibitors selected by the investigator. The enrolled population was moderately PI-experienced with more than half of patients having never received prior PI and around 80% of patients presenting a viral strain with less than 3 PI mutations. Mean age of patients enrolled was 41 years (range: 21 to 73); 51% were Caucasian and 66% were male. Mean baseline CD4+ T-cell count was 254 cells/mm³ (range: 4 to 952 cells/mm³) and mean baseline plasma HIV-1 RNA was 4.3 log₁₀ copies/ml (range: 1.7 to 6.6 log₁₀ copies/ml). Around 85% of patients had a viral load of <100,000 copies/ml.

Table 4

<table>
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<tr>
<th>Virologic Response of Study Subjects at Week 48 Study 802</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>NC= Failure</td>
</tr>
<tr>
<td>Observed data</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
</tr>
</tbody>
</table>

Through Week 48, genotypic resistance testing results were available from 75 patients in the QD group and 75 patients in the BID group who had incomplete virologic response. In the QD group, 6/75 (8%) patients demonstrated new primary protease inhibitor mutations (codons 30, 32, 48, 50, 82, 84, 90), as did 12/77 (16%) patients in the BID group.

**Paediatric Use**

M98-940 was an open-label study of a liquid formulation of Kaletra in 100 antiretroviral naïve (44%) and experienced (56%) paediatric patients. All patients were non-nucleoside reverse transcriptase inhibitor naïve. Patients were randomised to either 230 mg lopinavir/57.5 mg ritonavir per m² or 300 mg lopinavir/75 mg ritonavir per m². Naïve patients also received nucleoside reverse transcriptase inhibitors. Experienced patients received nevirapine plus up to two nucleoside reverse transcriptase inhibitors. Safety, efficacy and pharmacokinetic profiles of the two dose regimens were assessed after 3 weeks of therapy in each patient. Subsequently, all patients were continued on the 300/75 mg per m²
dose. Patients had a mean age of 5 years (range 6 months to 12 years) with 14 patients less than 2 years old and 6 patients one year or less. Mean baseline CD4+ T-cell count was 838 cells/mm³ and mean baseline plasma HIV-1 RNA was 4.7 log₁₀ copies/ml.

Table 5

<table>
<thead>
<tr>
<th>Outcomes at Week 48: Study M98-940</th>
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<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>HIV RNA &lt; 400 copies/ml</td>
</tr>
<tr>
<td>Mean increase from baseline in CD4+ T-cell count (cells/mm³)</td>
</tr>
</tbody>
</table>

5.2 Pharmacokinetic properties

The pharmacokinetic properties of lopinavir co-administered with ritonavir have been evaluated in healthy adult volunteers and in HIV-infected patients; no substantial differences were observed between the two groups. Lopinavir is essentially completely metabolised by CYP3A. Ritonavir inhibits the metabolism of lopinavir, thereby increasing the plasma levels of lopinavir. Across studies, administration of Kaletra 400/100 mg twice daily yields mean steady-state lopinavir plasma concentrations 15 to 20-fold higher than those of ritonavir in HIV-infected patients. The plasma levels of ritonavir are less than 7% of those obtained after the ritonavir dose of 600 mg twice daily. The in vitro antiviral EC₅₀ of lopinavir is approximately 10-fold lower than that of ritonavir. Therefore, the antiviral activity of Kaletra is due to lopinavir.

Absorption: multiple dosing with 400/100 mg Kaletra twice daily for 2 weeks and without meal restriction produced a mean ± SD lopinavir peak plasma concentration (Cₘₐₓ) of 12.3 ± 5.4 µg/ml, occurring approximately 4 hours after administration. The mean steady-state trough concentration prior to the morning dose was 8.1 ± 5.7 µg/ml. Lopinavir AUC over a 12 hour dosing interval averaged 113.2 ± 60.5 µg•h/ml. The absolute bioavailability of lopinavir co-formulated with ritonavir in humans has not been established.

Effects of food on oral absorption: Administration of a single 400/100 mg dose of Kaletra tablets under fed conditions (high fat, 872 kcal, 56% from fat) compared to fasted state was associated with no significant changes in Cₘₐₓ and AUCinf. Therefore, Kaletra tablets may be taken with or without food. Kaletra tablets have also shown less pharmacokinetic variability under all meal conditions compared to Kaletra soft capsules.

Distribution: at steady state, lopinavir is approximately 98 – 99% bound to serum proteins. Lopinavir binds to both alpha-1-acid glycoprotein (AAG) and albumin, however, it has a higher affinity for AAG. At steady state, lopinavir protein binding remains constant over the range of observed concentrations after 400/100 mg Kaletra twice daily, and is similar between healthy volunteers and HIV-positive patients.

Metabolism: in vitro experiments with human hepatic microsomes indicate that lopinavir primarily undergoes oxidative metabolism. Lopinavir is extensively metabolised by the hepatic cytochrome P450 system, almost exclusively by isozyme CYP3A. Ritonavir is a potent CYP3A inhibitor which inhibits the metabolism of lopinavir and therefore, increases plasma levels of lopinavir. A ¹⁴C-lopinavir study in humans showed that 89% of the plasma radioactivity after a single 400/100 mg Kaletra dose was due to parent active substance. At least 13 lopinavir oxidative metabolites have been identified in man. The 4-oxo and 4-hydroxymetabolite epimeric pair are the major metabolites with antiviral activity, but comprise only minute amounts of total plasma radioactivity. Ritonavir has been shown to induce metabolic enzymes, resulting in the induction of its own metabolism, and likely the induction of lopinavir metabolism. Pre-dose lopinavir concentrations decline with time during multiple dosing, stabilising after approximately 10 days to 2 weeks.
Elimination: after a 400/100 mg $^{14}$C-lopinavir/ritonavir dose, approximately 10.4 ± 2.3% and 82.6 ± 2.5% of an administered dose of $^{14}$C-lopinavir can be accounted for in urine and faeces, respectively. Unchanged lopinavir accounted for approximately 2.2% and 19.8% of the administered dose in urine and faeces, respectively. After multiple dosing, less than 3% of the lopinavir dose is excreted unchanged in the urine. The effective (peak to trough) half-life of lopinavir over a 12 hour dosing interval averaged 5 – 6 hours, and the apparent oral clearance (CL/F) of lopinavir is 6 to 7 l/h.

Once daily dosing: the pharmacokinetics of once daily Kaletra have been evaluated in HIV-infected subjects naïve to antiretroviral treatment. Kaletra 800/200 mg was administered in combination with emtricitabine 200 mg and tenofovir DF 300 mg as part of a once daily regimen. Multiple dosing of 800/200 mg Kaletra once daily for 2 weeks without meal restriction (n=16) produced a mean ± SD lopinavir peak plasma concentration ($C_{\text{max}}$) of 14.8 ± 3.5 μg/ml, occurring approximately 6 hours after administration. The mean steady-state trough concentration prior to the morning dose was 5.5 ± 5.4 μg/ml. Lopinavir AUC over a 24 hour dosing interval averaged 206.5 ± 89.7 μg·h/ml.

As compared to the BID regimen, the once daily dosing is associated with a reduction in the $C_{\text{min}}/C_{\text{trough}}$ values of approximately 50%.

Special Populations

Paediatrics:

There are limited pharmacokinetic data in children below 2 years of age. The pharmacokinetics of Kaletra oral solution 300/75 mg/m² twice daily and 230/57.5 mg/m² twice daily have been studied in a total of 53 paediatric patients, ranging in age from 6 months to 12 years. The lopinavir mean steady-state AUC, $C_{\text{max}}$, and $C_{\text{min}}$ were 72.6 ± 31.1 μg·h/ml, 8.2 ± 2.9 μg/ml and 3.4 ± 2.1 μg/ml, respectively after Kaletra oral solution 230/57.5 mg/m² twice daily without nevirapine (n=12), and were 85.8 ± 36.9 μg·h/ml, 10.0 ± 3.3 μg/ml and 3.6 ± 3.5 μg/ml, respectively after 300/75 mg/m² twice daily with nevirapine (n=12). The 230/57.5 mg/m² twice daily regimen without nevirapine and the 300/75 mg/m² twice daily regimen with nevirapine provided lopinavir plasma concentrations similar to those obtained in adult patients receiving the 400/100 mg twice daily regimen without nevirapine. Kaletra once daily has not been evaluated in paediatric patients.

Gender, Race and Age:

Kaletra pharmacokinetics have not been studied in the elderly. No age or gender related pharmacokinetic differences have been observed in adult patients. Pharmacokinetic differences due to race have not been identified.

Renal Insufficiency:

Kaletra pharmacokinetics have not been studied in patients with renal insufficiency; however, since the renal clearance of lopinavir is negligible, a decrease in total body clearance is not expected in patients with renal insufficiency.

Hepatic Insufficiency:

The steady state pharmacokinetic parameters of lopinavir in HIV-infected patients with mild to moderate hepatic impairment were compared with those of HIV-infected patients with normal hepatic function in a multiple dose study with lopinavir/ritonavir 400/100 mg twice daily. A limited increase in total lopinavir concentrations of approximately 30% has been observed which is not expected to be of clinical relevance (see section 4.2).
5.3 Preclinical safety data

Repeat-dose toxicity studies in rodents and dogs identified major target organs as the liver, kidney, thyroid, spleen and circulating red blood cells. Hepatic changes indicated cellular swelling with focal degeneration. While exposure eliciting these changes were comparable to or below human clinical exposure, dosages in animals were over 6-fold the recommended clinical dose. Mild renal tubular degeneration was confined to mice exposed with at least twice the recommended human exposure; the kidney was unaffected in rats and dogs. Reduced serum thyroxin led to an increased release of TSH with resultant follicular cell hypertrophy in the thyroid glands of rats. These changes were reversible with withdrawal of the active substance and were absent in mice and dogs. Coombs-negative anisocytosis and poikilocytosis were observed in rats, but not in mice or dogs. Enlarged spleens with histiocytosis were seen in rats but not other species. Serum cholesterol was elevated in rodents but not dogs, while triglycerides were elevated only in mice.

During in vitro studies, cloned human cardiac potassium channels (HERG) were inhibited by 30% at the highest concentrations of lopinavir/ritonavir tested, corresponding to a lopinavir exposure 7-fold total and 15-fold free peak plasma levels achieved in humans at the maximum recommended therapeutic dose. In contrast, similar concentrations of lopinavir/ritonavir demonstrated no repolarisation delay in the canine cardiac Purkinje fibres. Lower concentrations of lopinavir/ritonavir did not produce significant potassium (HERG) current blockade. Tissue distribution studies conducted in the rat did not suggest significant cardiac retention of the active substance; 72-hour AUC in heart was approximately 50% of measured plasma AUC. Therefore, it is reasonable to expect that cardiac lopinavir levels would not be significantly higher than plasma levels.

In dogs, prominent U waves on the electrocardiogram have been observed associated with prolonged PR interval and bradycardia. These effects have been assumed to be caused by electrolyte disturbance.

The clinical relevance of these preclinical data is unknown, however, the potential cardiac effects of this product in humans cannot be ruled out (see also sections 4.4 and 4.8).

In rats, embryofetotoxicity (pregnancy loss, decreased foetal viability, decreased foetal body weights, increased frequency of skeletal variations) and postnatal developmental toxicity (decreased survival of pups) was observed at maternally toxic dosages. The systemic exposure to lopinavir/ritonavir at the maternal and developmental toxic dosages was lower than the intended therapeutic exposure in humans.

Long-term carcinogenicity studies of lopinavir/ritonavir in mice revealed a nongenotoxic, mitogenic induction of liver tumours, generally considered to have little relevance to human risk.

Carcinogenicity studies in rats revealed no tumourigenic findings. Lopinavir/ritonavir was not found to be mutagenic or clastogenic in a battery of in vitro and in vivo assays including the Ames bacterial reverse mutation assay, the mouse lymphoma assay, the mouse micronucleus test and chromosomal aberration assays in human lymphocytes.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Tablet contents:
Copovidone
Sorbitan laurate
Colloidal anhydrous silica
Sodium stearyl fumarate
Film-coating:
Polyvinyl alcohol
Titanium dioxide
Talc
Macrogols type 3350 (Polyethylene glycol 3350)
Yellow ferric oxide E172

6.2 Incompatibilities

Not applicable.

6.3 Shelf life

2 years.

6.4 Special precautions for storage

This medicinal product does not require any special storage conditions.

6.5 Nature and content of container

High density polyethylene (HDPE) bottles closed with propylene caps. Each bottle contains 60 tablets. Each pack contains 1 bottle (60 tablets).

6.6 Special precautions for disposal

No special requirements.

7. MARKETING AUTHORITY

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

8. MARKETING AUTHORITY NUMBERS

EU/1/01/172/006

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORITY

Date of first authorisation: 20 March 2001
Date of last renewal: 20 March 2006

10. DATE OF REVISION OF THE TEXT

{MM/YYYY}
ANNEX II

A. MANUFACTURING AUTHORISATION HOLDER RESPONSIBLE FOR BATCH RELEASE

B. CONDITIONS OF THE MARKETING AUTHORISATION
A. MANUFACTURING AUTHORISATION HOLDER RESPONSIBLE FOR BATCH RELEASE

Name and address of the manufacturer(s) responsible for batch release

Kaletra oral solution, Kaletra soft capsules, Kaletra film-coated tablets:  
Aesica Queenborough Limited, Queenborough, Kent ME11 5EL, United Kingdom

Kaletra film-coated tablets:  
Abbott GmbH & Co. KG, Knollstrasse, 67061 Ludwigshafen, Germany

The printed package leaflet of the medicinal product must state the name and address of the manufacturer responsible for the release of the concerned batch.

B. CONDITIONS OF THE MARKETING AUTHORISATION

- CONDITIONS OR RESTRICTIONS REGARDING SUPPLY AND USE IMPOSED ON THE MARKETING AUTHORISATION HOLDER

Medicinal product subject to restricted medical prescription (See Annex I: Summary of Product Characteristics, 4.2).

- CONDITIONS OR RESTRICTIONS WITH REGARD TO THE SAFE AND EFFECTIVE USE OF THE MEDICINAL PRODUCT

Not applicable.

- OTHER CONDITIONS

Pharmacovigilance system

The Marketing Authorisation Holder must ensure that the system of pharmacovigilance, as described in version 5 presented in Module 1.8.1 of the Marketing Authorisation Application, is in place and functioning before and whilst the product is on the market.

Risk Management Plan

The Marketing Authorisation Holder commits to performing the studies and additional pharmacovigilance activities detailed in the Pharmacovigilance Plan, as agreed in version 2.3 of the Risk Management Plan (RMP) presented in Module 1.8.2 of the Marketing Authorisation Application and any subsequent updates of the RMP agreed by the CHMP.

As per the CHMP Guideline on Risk Management Systems for medicinal products for human use, the updated RMP should be submitted at the same time as the next Periodic Safety Update Report (PSUR).

In addition, an updated RMP should be submitted

- When new information is received that may impact on the current Safety Specification, Pharmacovigilance Plan or risk minimisation activities
- Within 60 days of an important (pharmacovigilance or risk minimisation) milestone being reached
- At the request of the EMEA

Periodic Safety Update Reports

The Marketing Authorisation Holder will submit Periodic Safety Update Reports on a 3 year cycle.
ANNEX III

LABELLING AND PACKAGE LEAFLET
A. LABELLING
PARTICULARS TO APPEAR ON THE OUTER PACKAGING
CAPSULES - CARTON OF 2 BOTTLES

1. NAME OF THE MEDICINAL PRODUCT
Kaletra 133.3 mg/33.3 mg soft capsules
lopinavir/ritonavir

2. STATEMENT OF ACTIVE SUBSTANCE(S)
Each soft capsule contains: lopinavir 133.3 mg and ritonavir 33.3 mg (pharmacokinetic enhancer).

3. LIST OF EXCIPIENTS
Includes: propylene glycol, polyoxyl 35 castor oil, anhydrized liquid sorbitol (mixture of sorbitol, sorbitol anhydrides and mannitol), glycerol and sunset yellow (E110).

4. PHARMACEUTICAL FORM AND CONTENTS
180 soft capsules (2 bottles of 90 capsules each)

5. METHOD AND ROUTE(S) OF ADMINISTRATION
Oral use
Read the package leaflet before use

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN
Keep out of the reach and sight of children

7. OTHER SPECIAL WARNING(S), IF NECESSARY
Child resistant closure.

8. EXPIRY DATE
EXP: {MM/YYYY}

9. SPECIAL STORAGE CONDITIONS
Store in a refrigerator
In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.
Avoid exposure to excessive heat.
10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/01/172/001

13. BATCH NUMBER

Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE
# PARTICULARS TO APPEAR ON THE IMMEDIATE PACKAGING

## CAPSULES - BOTTLE

### 1. NAME OF THE MEDICINAL PRODUCT

Kaletra 133.3 mg/33.3 mg soft capsules
lopinavir/ritonavir

### 2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each soft capsule contains: lopinavir 133.3 mg and ritonavir 33.3 mg (pharmacokinetic enhancer).

### 3. LIST OF EXCIPIENTS

Includes: propylene glycol, polyoxyl 35 castor oil, anhydrized liquid sorbitol (mixture of sorbitol, sorbitol anhydrides and mannitol), glycerol and sunset yellow (E110).

### 4. PHARMACEUTICAL FORM AND CONTENTS

90 soft capsules

### 5. METHOD AND ROUTE(S) OF ADMINISTRATION

Oral use
Read the package leaflet before use

### 6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN

Keep out of the reach and sight of children

### 7. OTHER SPECIAL WARNING(S), IF NECESSARY

Child resistant closure.

### 8. EXPIRY DATE

EXP: {MM/YYYY}
9. SPECIAL STORAGE CONDITIONS

Store in a refrigerator
In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.
Avoid exposure to excessive heat.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

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Maidenhead
Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/01/172/001

13. BATCH NUMBER

Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE
### PARTICULARS TO APPEAR ON THE OUTER PACKAGING

**CAPSULES - PACK OF 180 (5 CARTONS OF 6 BLISTERS OF 6 CAPSULES)**

1. **NAME OF THE MEDICINAL PRODUCT**
   
   Kaletra 133.3 mg/33.3 mg soft capsules  
   lopinavir/ritonavir

2. **STATEMENT OF ACTIVE SUBSTANCE(S)**

   Each soft capsule contains: lopinavir 133.3 mg and ritonavir 33.3 mg (pharmacokinetic enhancer).

3. **LIST OF EXCIPIENTS**

   Includes: propylene glycol, polyoxyl 35 castor oil, anhydried liquid sorbitol (mixture of sorbitol, sorbitol anhydrides and mannitol), glycerol and sunset yellow (E110).

4. **PHARMACEUTICAL FORM AND CONTENTS**

   Contains: 180 soft capsules (5 cartons of 6 foil blisters of 6 capsules)

5. **METHOD AND ROUTE(S) OF ADMINISTRATION**

   Oral use  
   Read the package leaflet before use

6. **SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN**

   Keep out of the reach and sight of children

7. **OTHER SPECIAL WARNING(S), IF NECESSARY**

8. **EXPIRY DATE**

   EXP: {MM/YYYY}

9. **SPECIAL STORAGE CONDITIONS**

   Store in a refrigerator  
   In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.  
   Avoid exposure to excessive heat.
10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/01/172/002

13. BATCH NUMBER

Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE
PARTICULARS TO APPEAR ON THE OUTER PACKAGING
CAPSULES - CARTON OF 36 CAPSULES (6 BLISTERS OF 6 CAPSULES)

1. NAME OF THE MEDICINAL PRODUCT
Kaletra 133.3 mg/33.3 mg soft capsules
lopinavir/ritonavir

2. STATEMENT OF ACTIVE SUBSTANCE(S)
Each soft capsule contains: lopinavir 133.3 mg and ritonavir 33.3 mg (pharmacokinetic enhancer).

3. LIST OF EXCIPIENTS
Includes: propylene glycol, polyoxyl 35 castor oil, anhydrized liquid sorbitol (mixture of sorbitol, sorbitol anhydrides and mannitol), glycerol and sunset yellow (E110).

4. PHARMACEUTICAL FORM AND CONTENTS
Contains: 36 soft capsules (6 foil blisters of 6 capsules)

5. METHOD AND ROUTE(S) OF ADMINISTRATION
Oral use
Read the package leaflet before use

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN
Keep out of the reach and sight of children

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE
EXP: {MM/YYYY}

9. SPECIAL STORAGE CONDITIONS
Store in a refrigerator
In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.
Avoid exposure to excessive heat.
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<th><strong>10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE</strong></th>
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<th><strong>15. INSTRUCTIONS ON USE</strong></th>
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</table>

<table>
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<tr>
<th><strong>16. INFORMATION IN BRAILLE</strong></th>
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### MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

**CAPSULES - BLISTER OF 6 CAPSULES**

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<tr>
<td>2. NAME OF THE MARKETING AUTHORISATION HOLDER</td>
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<tr>
<td>5. OTHER</td>
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PARTICULARS TO APPEAR ON THE OUTER PACKAGING

ORAL SOLUTION CARTON - 300 ML OF SOLUTION (5 BOTTLES OF 60 ML EACH)

1. NAME OF THE MEDICINAL PRODUCT

Kaletra (80 mg + 20 mg) / ml oral solution
(lopinavir + ritonavir)

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each ml contains: lopinavir 80 mg and ritonavir 20 mg (pharmacokinetic enhancer).

3. LIST OF EXCIPIENTS

Includes: alcohol (42 % v/v see leaflet), high fructose corn syrup, propylene glycol, glycerol, polyoxyl 40 hydrogenated castor oil, potassium (as acesulfame potassium).

4. PHARMACEUTICAL FORM AND CONTENTS

300 ml of solution (5 bottles of 60 ml each).

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Oral use
Read the package leaflet before use

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN

Keep out of the reach and sight of children

7. OTHER SPECIAL WARNING(S), IF NECESSARY

Child resistant closure.

8. EXPIRY DATE

EXP: {MM/YYYY}
9. SPECIAL STORAGE CONDITIONS

Store in a refrigerator
In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.
Avoid exposure to excessive heat.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/01/172/003

13. BATCH NUMBER

Lot: [number]

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Kaletra
**PARTICULARS TO APPEAR ON THE IMMEDIATE PACKAGING**

**ORAL SOLUTION - BOTTLE LABEL**

1. **NAME OF THE MEDICINAL PRODUCT**

Kaletra (80 mg + 20 mg) / ml oral solution  
(lopinavir + ritonavir)

2. **STATEMENT OF ACTIVE SUBSTANCE(S)**

Each ml contains lopinavir 80 mg and ritonavir 20 mg (pharmacokinetic enhancer).

3. **LIST OF EXCIPIENTS**

Includes: alcohol (42 % v/v see leaflet), high fructose corn syrup, propylene glycol, glycerol, polyoxyl 40 hydrogenated castor oil, potassium (as acesulfame potassium).

4. **PHARMACEUTICAL FORM AND CONTENTS**

60 ml of solution

5. **METHOD AND ROUTE(S) OF ADMINISTRATION**

Oral use  
Read the package leaflet before use.  
Important to open

6. **SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN**

Keep out of the reach and sight of children

7. **OTHER SPECIAL WARNING(S), IF NECESSARY**

Child resistant closure.

8. **EXPIRY DATE**

EXP: {MM/YYYY}
9. SPECIAL STORAGE CONDITIONS

Store in a refrigerator
In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.
Avoid exposure to excessive heat.

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE

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United Kingdom

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/01/172/003

13. BATCH NUMBER

Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE
PARTICULARS TO APPEAR ON THE OUTER PACKAGING

200 MG/50 MG TABLETS - CARTON OF 1 BOTTLE

1. NAME OF THE MEDICINAL PRODUCT

Kaletra 200 mg/50 mg film-coated tablets
lopinavir/ritonavir

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 200 mg of lopinavir co-formulated with 50 mg of ritonavir as a pharmacokinetic enhancer.

3. LIST OF EXCIPIENTS

4. PHARMACEUTICAL FORM AND CONTENTS

120 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Oral use
Read the package leaflet before use

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN

Keep out of the reach and sight of children

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP: {MM/YYYY}

9. SPECIAL STORAGE CONDITIONS

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE
11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/01/172/004

13. BATCH NUMBER

Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Kaletra 200 mg/50 mg tablets
### PARTICULARS TO APPEAR ON THE OUTER PACKAGING

**200 MG/50 MG TABLETS - CARTON OF 3 BOTTLES**

**1. NAME OF THE MEDICINAL PRODUCT**

Kaletra 200 mg/50 mg film-coated tablets
lopinavir/ritonavir

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 200 mg of lopinavir co-formulated with 50 mg of ritonavir as a pharmacokinetic enhancer.

**3. LIST OF EXCIPIENTS**

**4. PHARMACEUTICAL FORM AND CONTENTS**

360 film-coated tablets (3 bottles each containing 120 film-coated tablets)
3 month pack

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Oral use
Read the package leaflet before use

**6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN**

Keep out of the reach and sight of children

**7. OTHER SPECIAL WARNING(S), IF NECESSARY**

**8. EXPIRY DATE**

EXP: {MM/YYYY}

**9. SPECIAL STORAGE CONDITIONS**

**10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**
11. NAME AND ADDRESS OF THE MARKETING AUTHORITY

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/01/172/007

13. BATCH NUMBER

Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Kaletra 200 mg/50 mg tablets
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<th>PARTICULARS TO APPEAR ON THE IMMEDIATE PACKAGING</th>
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<td>200 MG/50 MG TABLETS - BOTTLE LABEL</td>
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1. **NAME OF THE MEDICINAL PRODUCT**

Kaletra 200 mg/50 mg film-coated tablets
lopinavir/ritonavir

2. **STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 200 mg of lopinavir co-formulated with 50 mg of ritonavir as a pharmacokinetic enhancer.

3. **LIST OF EXCIPIENTS**

4. **PHARMACEUTICAL FORM AND CONTENTS**

120 film-coated tablets

5. **METHOD AND ROUTE(S) OF ADMINISTRATION**

Oral use
Read the package leaflet before use

6. **SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN**

Keep out of the reach and sight of children

7. **OTHER SPECIAL WARNING(S), IF NECESSARY**

8. **EXPIRY DATE**

EXP: {MM/YYYY}

9. **SPECIAL STORAGE CONDITIONS**

10. **SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**
11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER
Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
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Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORISATION NUMBER(S)
EU/1/01/172/004
EU/1/01/172/007

13. BATCH NUMBER
Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY
Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE
**PARTICULARS TO APPEAR ON THE OUTER PACKAGING**

200 MG/50 MG TABLETS - PACK OF 120 (3 CARTONS OF 5 FOIL BLISTERS OF 8 FILM-COATED TABLETS) OR (1 CARTON OF 10 FOIL BLISTERS OF 12 FILM-COATED TABLETS)

---

1. **NAME OF THE MEDICINAL PRODUCT**

Kaletra 200 mg/50 mg film-coated tablets
lopinavir/ritonavir

2. **STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 200 mg of lopinavir co-formulated with 50 mg of ritonavir as a pharmacokinetic enhancer.

3. **LIST OF EXCIPIENTS**

4. **PHARMACEUTICAL FORM AND CONTENTS**

Contains: 120 film-coated tablets (3 cartons of 5 foil blisters of 8 tablets)
120 film-coated tablets (1 carton of 10 foil blisters of 12 tablets).

5. **METHOD AND ROUTE(S) OF ADMINISTRATION**

Oral use
Read the package leaflet before use

6. **SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN**

Keep out of the reach and sight of children

7. **OTHER SPECIAL WARNING(S), IF NECESSARY**

8. **EXPIRY DATE**

EXP: {MM/YYYY}

9. **SPECIAL STORAGE CONDITIONS**

10. **SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**
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<td>16. INFORMATION IN BRAILLE</td>
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<tr>
<td>Kaletra 200 mg/50 mg</td>
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</table>
**PARTICULARS TO APPEAR ON THE OUTER PACKAGING**

**200 MG/50 MG TABLETS - INNER CARTON OF 40 FILM-COATED TABLETS (5 FOIL BLISTERS OF 8 FILM-COATED TABLETS)**

1. **NAME OF THE MEDICINAL PRODUCT**

   Kaletra 200 mg/50 mg film-coated tablets
   lopinavir/ritonavir

2. **STATEMENT OF ACTIVE SUBSTANCE(S)**

   Each film-coated tablet contains 200 mg of lopinavir co-formulated with 50 mg of ritonavir as a pharmacokinetic enhancer.

3. **LIST OF EXCIPIENTS**

4. **PHARMACEUTICAL FORM AND CONTENTS**

   Contains: 40 film-coated tablets (5 foil blisters of 8 film-coated tablets).

5. **METHOD AND ROUTE(S) OF ADMINISTRATION**

   Oral use
   Read the package leaflet before use

6. **SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN**

   Keep out of the reach and sight of children

7. **OTHER SPECIAL WARNING(S), IF NECESSARY**

8. **EXPIRY DATE**

   EXP: { MM/YYYY}

9. **SPECIAL STORAGE CONDITIONS**

10. **SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE**
11. NAME AND ADDRESS OF THE MARKETING AUTHORIZATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORIZATION NUMBER(S)

EU/1/01/172/005

13. BATCH NUMBER

Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Kaletra 200 mg/50 mg tablets
**MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS**

**200 MG/50 MG TABLETS - BLISTER OF 8 FILM-COATED TABLETS OR BLISTER OF 12 FILM-COATED TABLETS**

1. **NAME OF THE MEDICINAL PRODUCT**

Kaletra 200 mg/50 mg film-coated tablets
lopinavir/ritonavir

2. **NAME OF THE MARKETING AUTHORITY Holder**

Abbott Laboratories Limited

3. **EXPIRY DATE**

EXP: {MM/YYYY}

4. **BATCH NUMBER**

Lot: {number}

6. **OTHER**
PARTICULARS TO APPEAR ON THE OUTER PACKAGING

100 MG/ 25 MG TABLETS - CARTON OF 1 BOTTLE

1. NAME OF THE MEDICINAL PRODUCT

Kaletra 100 mg/25 mg film-coated tablets
lopinavir/ritonavir

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 100 mg of lopinavir co-formulated with 25 mg of ritonavir as a pharmacokinetic enhancer.

3. LIST OF EXCIPIENTS

4. PHARMACEUTICAL FORM AND CONTENTS

60 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Oral use
Read the package leaflet before use

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN

Keep out of the reach and sight of children

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP: {MM/YYYY}

9. SPECIAL STORAGE CONDITIONS

10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE
11. NAME AND ADDRESS OF THE MARKETING AUTHORIZATION HOLDER

Abbott Laboratories Limited
Abbott House
Vanwall Business Park
Vanwall Road
Maidenhead
Berkshire SL6 4XE
United Kingdom

12. MARKETING AUTHORIZATION NUMBER(S)

EU/1/01/172/006

13. BATCH NUMBER

Lot: {number}

14. GENERAL CLASSIFICATION FOR SUPPLY

Medicinal product subject to medical prescription.

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Kaletra 100 mg/25 mg tablets
PARTICULARS TO APPEAR ON THE IMMEDIATE PACKAGING

100 MG/25 MG TABLETS - BOTTLE LABEL

1. NAME OF THE MEDICINAL PRODUCT

Kaletra 100 mg/25 mg film-coated tablets
lopinavir/ritonavir

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 100 mg of lopinavir co-formulated with 25 mg of ritonavir as a pharmacokinetic enhancer.

3. LIST OF EXCIPIENTS

4. PHARMACEUTICAL FORM AND CONTENTS

60 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Oral use
Read the package leaflet before use

6. SPECIAL WARNING THAT THE MEDICINAL PRODUCT MUST BE STORED OUT OF THE REACH AND SIGHT OF CHILDREN

Keep out of the reach and sight of children

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP: {MM/YYYY}

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15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE
Read all of this leaflet carefully before you start taking this medicine.

− Keep this leaflet. You may need to read it again.
− If you have any further questions, please ask your doctor or pharmacist.
− This medicine has been prescribed for you. Do not pass it onto others. It may harm them, even if their symptoms are the same as yours.
− If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please tell your doctor or pharmacist.

In this leaflet:
1. What Kaletra is and what it is used for
2. Before you take Kaletra
3. How to take Kaletra
4. Possible side effects
5. How to store Kaletra
6. Further information

1. WHAT KALETRA IS AND WHAT IT IS USED FOR

− Your doctor has prescribed Kaletra to help to control your Human Immunodeficiency Virus (HIV) infection. Kaletra does this by slowing down the spread of the infection in your body.
− Kaletra is used by children 2 years of age or older and adults who are infected with HIV, the virus which causes AIDS. Kaletra should not be administered to children younger than 2 years of age unless specifically directed by their doctor.
− Kaletra is an antiretroviral medicine. It belongs to a group of medicines called protease inhibitors.
− Kaletra is prescribed for use in combination with other antiviral medicines. Your doctor will determine which medicines are best for you.

2. BEFORE YOU TAKE KALETRA

Do not take Kaletra
− if you are allergic (hypersensitive) to lopinavir, ritonavir or any of the other ingredients of Kaletra.
− if you have severe liver problems.

Do not take Kaletra with any of the following medicines:
− Astemizole or terfenadine (commonly used to treat allergy symptoms – these medicines may be available without prescription);
− Midazolam taken orally (taken by mouth), triazolam (used to relieve anxiety and/or trouble sleeping);
− Pimozide (used to treat schizophrenia);
− Cisapride (used to relieve certain stomach problems);
− Ergotamine, dihydroergotamine, ergonovine, methylergonovine (used to treat headaches);
− Amiodarone (used to treat abnormal heart beat);
− Lovastatin, simvastatin (used to lower blood cholesterol);
− Vardenafil (used to treat erectile dysfunction);
− Sildenafil (used to treat pulmonary arterial hypertension). Sildenafil used to treat erectile
dysfunction may be taken under doctor’s supervision (see Take special care with Kaletra
section);
− Products that contain St John’s wort (*Hypericum perforatum*).

Read the list of medicines under ‘Taking other medicines’ for information on certain other
medicines which require special care.

If you are currently taking any of these medicines, ask your doctor about switching to another
medicine while you are taking Kaletra.

Take special care with Kaletra

Important information
− Kaletra is not a cure for HIV infection or AIDS.
− People taking Kaletra may still develop infections or other illnesses associated with HIV disease
and AIDS. It is therefore important that you remain under the supervision of your doctor while
taking Kaletra.
− Kaletra **does not reduce the risk of passing HIV to others.** Appropriate precautions should be
taken to prevent passing the disease through sexual contact (e.g. use of a condom) or blood
contamination.

Tell your doctor if you have/had:
− **Haemophilia** type A and B as Kaletra might increase the risk of bleeding.
− **Diabetes** as increased blood sugars have been reported in patients receiving Kaletra.
− A history of **liver problems** as patients with a history of liver disease, including chronic
hepatitis B or C are at increased risk of severe and potentially fatal liver side effects.

Tell your doctor if you experience:
− Nausea, vomiting, abdominal pain, difficulty breathing and severe weakness of the muscles in
the legs and arms as these symptoms may indicate raised lactic acid levels.
− Thirst, frequent urination, blurred vision or weight loss as this may indicate raised sugar levels
in the blood.
− Nausea, vomiting, abdominal pain as large increases in the amount of triglycerides (fats in the
blood) have been considered a risk factor for pancreatitis (inflammation of the pancreas) and
these symptoms may suggest this condition.
− **Changes in body shape** due to changes in fat distribution. These may include loss of fat from
legs, arms and face, increased fat in the abdomen (belly) and other internal organs, breast
enlargement and fatty lumps on the back of the neck (‘buffalo hump’). The cause and long-term
health effects of these conditions are not known at this time.
− **Signs and symptoms of inflammation** from previous infections soon after anti-HIV treatment
is started. It is believed that these symptoms are due to an improvement in the body’s immune
response, enabling the body to fight infections that may have been present with no obvious
symptoms.
− **Joint stiffness, aches and pains** (especially of the hip, knee and shoulder) and difficulty in
movement as some patients taking these medicines may develop a bone disease called
osteonecrosis (death of bone tissue caused by loss of blood supply to the bone). The length of
combination antiretroviral therapy, corticosteroid use, alcohol consumption, severe
immunosuppression (reduction in the activity of the immune system), higher body mass index,
among others, may be some of the many risk factors for developing this disease.
− **Muscle pain**, tenderness or weakness, particularly in combination with these medicines. On
rare occasions these muscle disorders have been serious.
Taking other medicines

Tell your doctor if you are taking any of the medicines listed below, as special care should then be taken:

- Antibiotics (e.g. rifabutin, rifampicin, clarithromycin);
- Anticancer medicines (e.g. most tyrosine kinases inhibitors such as dasatinib and nilotinib, also vincristine and vinblastine);
- Antidepressants (e.g. trazodone, bupropion);
- Anti-epilepsy medicines (e.g. carbamazepine, phenytoin, phenobarbital);
- Antifungals (e.g. ketoconazole, itraconazole, voriconazole);
- Erectile dysfunction medicines (e.g. sildenafil and tadalafil);
- Heart medicines including:
  - Digoxin;
  - Calcium channel antagonists (e.g. felodipine, nifedipine, nicardipine);
  - Medicines used to correct heart rhythm (e.g. bepridil, systemic lidocaine, quinidine);
- Medicines used to lower blood cholesterol (e.g. atorvastatin, lovastatin, rosuvastatin or simvastatin);
- Medicines affecting the immune system (e.g. cyclosporin, sirolimus (rapamycin), tacrolimus);
- Medicines used for smoking cessation (e.g. bupropion);
- Pain-relieving medicines (e.g. fentanyl);
- Morphine-like medicines (e.g. methadone);
- Oral contraceptive or using a patch contraceptive to prevent pregnancy (see section below titled Contraceptives);
- Protease inhibitors (e.g. amprenavir, fosamprenavir, indinavir, nelfinavir, ritonavir, saquinavir, tipranavir);
- Sedatives (e.g. midazolam administered by injection);
- Steroids (e.g. dexamethasone, fluticasone propionate, ethinyl oestradiol);
- Warfarin.
- Medicines that cause a reaction with alcohol (e.g. disulfiram).

Read the list of medicines under ‘Do not take Kaletra with any of the following medicines’ for information on medicines that you must not take with Kaletra.

Please tell your doctor or pharmacist if you are taking or have recently taken any other medicines, including medicines obtained without prescription.

Erectile dysfunction medicines (vardenafil, sildenafil, tadalafil)

- Do not take Kaletra if you are currently taking vardenafil.
- You must not take Kaletra with sildenafil used to treat pulmonary arterial hypertension (see also Do not take Kaletra section).
- If you take sildenafil or tadalafil and Kaletra together, you may be at risk of side effects such as low blood pressure, passing out, visual changes and penile erection lasting more than 4 hours. If an erection lasts longer than 4 hours, you should get medical help immediately to avoid permanent damage to your penis. Your doctor can explain these symptoms to you.

Contraceptives

- If you are currently using an oral contraceptive or using a patch contraceptive to prevent pregnancy, you should use an additional or different type of contraception (e.g. condom) as Kaletra may reduce the effectiveness of oral and patch contraceptives.
- Kaletra does not reduce the risk of passing HIV to others. Appropriate precautions (e.g. use of a condom) should be taken to prevent passing on the disease through sexual contact.
Taking Kaletra with food and drink

It is important that Kaletra is taken with food.

Pregnancy and breast-feeding

− Tell you doctor immediately if you are pregnant, think you may be pregnant or if you are breast-feeding.
− Pregnant or breast-feeding mothers should not take Kaletra unless specifically directed by the doctor.
− It is recommended that HIV-infected women do not breast-feed their infants because there is a possibility that the baby can be infected with HIV through your breast milk.

Driving or using machines

Kaletra has not specifically been tested for its possible effects on the ability to drive a car or operate machines. Do not drive a car or operate machinery if you experience any side effects (e.g. nausea) that impact your ability to do so safely. Instead, contact your doctor.

Important information about some of the ingredients of Kaletra

Sunset yellow [E110], a component of Kaletra soft capsules, can cause allergic-type reactions including asthma. Allergy is more common in those people who are allergic to aspirin.

3. HOW TO TAKE KALETRA

− It is important that all doses of Kaletra soft capsules are taken with food.
− Always take Kaletra exactly as your doctor has told you.
− You should check with your doctor or pharmacist if you are not sure how you should take your medicine.

How much Kaletra should be taken and when?

− The usual adult dose is 3 capsules twice a day i.e. every 12 hours, in combination with other anti-HIV medicines. Your doctor will advise on the amount of Kaletra to be taken.
− For children, your doctor will decide the right dose based on the child’s height and weight.
− Kaletra is also supplied as film-coated tablets containing 200 mg of lopinavir and 50 mg of ritonavir, film-coated tablets containing 100 mg of lopinavir and 25 mg of ritonavir and oral solution containing 80 mg of lopinavir and 20 mg of ritonavir per ml.

Can I stop taking Kaletra or change my dose?

− Do not stop or change the daily dose of Kaletra without first consulting with your doctor.
− Kaletra should always be taken twice every day to help control your HIV infection, no matter how much better you feel.
− Using Kaletra as recommended should give you the best chance of delaying the development of resistance to the product.
− If a side effect is preventing you from taking Kaletra as directed tell your doctor right away.
− Always keep enough Kaletra on hand so you don’t run out. When you travel or need to stay in the hospital make sure you will have enough Kaletra to last until you can get a new supply.
− Continue to take this medicine until your doctor tells you otherwise.
If you take more Kaletra than you should

- If you realise you have taken more Kaletra than you were supposed to, contact your doctor right away.
- If you cannot reach your doctor, go to the hospital.

If you forget to take Kaletra

- If you miss a dose, take the missed dose as soon as possible together with some food, and then continue with your normal dose on the regular schedule as prescribed by your doctor.
- Do not take a double dose to make up for a forgotten dose.

4. POSSIBLE SIDE EFFECTS

Like all medicines, Kaletra can cause side effects, although not everybody gets them. It may be difficult to tell which side effects have been caused by Kaletra and which may occur due to other medicines you take at the same time or by the complications of the HIV infection.

You should tell your doctor promptly about these or any other symptoms. If the condition persists or worsens, seek medical attention.

**VERY COMMON** side effects (affects more than 1 user in 10):
- Diarrhoea;
- Nausea;
- Upper respiratory tract infection.

**COMMON** side effects (affects 1 to 10 users in 100):
- Inflammation of the pancreas;
- Vomiting, enlarged abdomen, pain in the lower and upper stomach area, passing wind, indigestion, decreased appetite, reflux from your stomach to your oesophagus which may cause pain;
- Swelling or inflammation of the stomach, intestines and colon;
- Increased cholesterol levels in your blood, increased triglycerides (a form of fat) levels in your blood, high blood pressure;
- Decreased ability of the body to handle sugar including diabetes mellitus, weight loss;
- Low number of red blood cells, low number of white blood cells which are usually used to fight infection;
- Rash, eczema, accumulation of scales of greasy skin;
- Dizziness, anxiety, difficulty in sleeping;
- Feeling tired, lack of strength and energy, headache including migraine;
- Haemorrhoids;
- Inflammation of the liver including increased liver enzymes;
- Allergic reactions including hives and inflammation in the mouth;
- Changes in body shape or face shape due to changes in fat distribution;
- Lower respiratory tract infection;
- Enlargement of the lymph nodes;
- Impotence, abnormally heavy or extended menstrual flow or a lack of menstruation;
- Muscle disorders such as weakness and spasms, pain in the joints, muscles and back;
- Damage to nerves of the peripheral nervous system;
- Night sweats, itching, rash including raised bumps on the skin, infection of the skin, inflammation of skin or hair pores, accumulation of fluid in the cells or tissues.

**Further information about nausea, vomiting or abdominal pain**

Tell your doctor if you experience nausea, vomiting or abdominal pain as these may be suggestive of pancreatitis (inflammation of the pancreas).
Further information about increased cholesterol and triglycerides
- The long-term risks for complications such as heart attacks or stroke due to increased triglycerides and cholesterol are not known at this time.
- Your doctor will monitor you and may prescribe other medicines if needed.
- Large increases in the amount of triglycerides (fats in the blood) have been considered a risk factor for pancreatitis (inflammation of the pancreas).

Changes in body shape due to changes in fat distribution
Combination antiretroviral therapy may cause changes in body shape due to changes in fat distribution. These may include loss of fat from legs, arms and face, increased fat in the abdomen (belly) and other internal organs, breast enlargement and fatty lumps on the back of the neck (‘buffalo hump’). The cause and long-term health effects of these conditions are not known at this time. Tell your doctor if you notice any changes in your body shape due to changes in fat distribution.

UNCOMMON side effects (affects 1 to 10 users in 1,000):
- Abnormal dreams;
- Loss or changed sense of taste;
- Hair loss;
- An abnormality in your electrocardiogram called atrioventricular block;
- Plaque building up inside your arteries which could lead to heart attack and stroke;
- Inflammation of blood vessels and capillaries;
- Inflammation of the bile duct;
- Uncontrolled shaking of the body;
- Constipation;
- Deep vein inflammation related to a blood clot;
- Dry mouth;
- Inability to control your bowels;
- Inflammation of the first section of the small intestine just after the stomach, wound or ulcer in the digestive tract, bleeding from the intestinal tract or rectum;
- Red blood cells in the urine;
- Fatty deposits in the liver, enlarged liver;
- Lack of functioning of the testes;
- A flare-up of symptoms related to an inactive infection in your body (immune reconstitution);
- Increased appetite;
- Abnormally high level of bilirubin (a pigment produced from the breakdown of red blood cells) in the blood
- Decreased sexual desire;
- Inflammation of the kidney;
- Bone death caused by poor blood supply to the area;
- Mouth sores or ulcerations, inflammation of the stomach and intestine;
- Kidney failure;
- Breakdown of muscle fibbers resulting in the release of muscle fiber contents (myoglobin) into the bloodstream;
- A sound in one ear or both ears, such as buzzing, ringing or whistling;
- Tremor;
- Abnormal closure of one of the valves (tricuspid valve in your heart);
- Vertigo (spinning feeling);
- Eye disorder, abnormal vision;
- Weight gain.

Other side effects that have been reported with Kaletra: yellowing of the skin or whites of eyes (jaundice), severe or life threatening skin rashes and blisters (Stevens-Johnson syndrome and erythema multiforme). It is not known how frequently these effects may occur.
If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please inform your doctor or pharmacist.

5. HOW TO STORE KALETRA

− Keep out of the reach and sight of children.
− Do not use Kaletra after the expiry date which is stated on the pack. The expiry date refers to the last day of that month.

How should I store Kaletra and for how long?

− Store in a refrigerator (2°C - 8°C).
− In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.
− Avoid exposure to excessive heat.
− It is important to keep Kaletra in the bottle it came in. Do not transfer it to any other container.

How should I dispose of any unused Kaletra?

− Medicines should not be disposed of via wastewater or household waste.
− Ask your pharmacist how to dispose of medicines no longer required.
These measures will help protect the environment.

6. FURTHER INFORMATION

What Kaletra contains

The active substance is lopinavir, the capsules also contain ritonavir which acts to increase the blood levels of lopinavir by inhibiting enzymes which metabolise it. Each capsule of Kaletra contains 133.3 mg of lopinavir and 33.3 mg of ritonavir (pharmacokinetic enhancer).

The other ingredients are: oleic acid, propylene glycol, polyoxyl 35 castor oil, purified water.

The capsule shell components are: gelatine, anhydridzed liquid sorbitol (mixture of sorbitol, sorbitol anhydrides and mannitol), glycerol, titanium dioxide (white colour), sunset yellow (E110), medium-chain triglycerides, lecithin and black ink containing: propylene glycol, black iron oxide, polyvinyl acetate phthalate, polyethylene glycol 400 and ammonium hydroxide.

What Kaletra looks like and contents of the pack

− Kaletra soft capsules come in a plastic bottle containing 90 capsules. The capsules are orange with a black ink imprint of the [Abbott logo] and “PK”.
− Two bottles of 90 capsules are provided in one package.
− Each capsule of Kaletra contains 133.3 mg of lopinavir and 33.3 mg of ritonavir.
− Kaletra soft capsules are also supplied in blisters.
− Each carton contains 6 foil blisters of 6 capsules (36 capsules). Each pack contains 5 cartons (180 capsules).
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Abbott House
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United Kingdom

Manufacturer
Aesica Queenborough Ltd
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United Kingdom

For any information about this medicine, please contact the local representative of the Marketing Authorisation Holder:

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This leaflet was last approved in: {MM/YYYY}
Read all of this leaflet carefully before you start taking this medicine.

− Keep this leaflet. You may need to read it again.
− If you have any further questions, please ask your doctor or pharmacist
− This medicine has been prescribed for you. Do not pass it onto others. It may harm them, even if their symptoms are the same as yours.
− If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please tell your doctor or pharmacist.

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− Lovastatin, simvastatin (used to lower blood cholesterol);
− Vardenafil (used to treat erectile dysfunction);
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– Products that contain St John’s wort (Hypericum perforatum).

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If you are currently taking any of these medicines, ask your doctor about switching to another medicine while you are taking Kaletra.

Take special care with Kaletra

Important information
– Kaletra is not a cure for HIV infection or AIDS.
– People taking Kaletra may still develop infections or other illnesses associated with HIV disease and AIDS. It is therefore important that you remain under the supervision of your doctor while taking Kaletra.
– Kaletra does not reduce the risk of passing HIV to others. Appropriate precautions should be taken to prevent passing the disease through sexual contact (e.g. use of a condom) or blood contamination.

Tell your doctor if you have/had:
– Haemophilia type A and B as Kaletra might increase the risk of bleeding.
– Diabetes as increased blood sugars have been reported in patients receiving Kaletra.
– A history of liver problems as patients with a history of liver disease, including chronic hepatitis B or C are at increased risk of severe and potentially fatal liver side effects.

Tell your doctor if you experience:
– Nausea, vomiting, abdominal pain, difficulty breathing and severe weakness of the muscles in the legs and arms as these symptoms may indicate raised lactic acid levels.
– Thirst, frequent urination, blurred vision or weight loss as this may indicate raised sugar levels in the blood.
– Nausea, vomiting, abdominal pain as large increases in the amount of triglycerides (fats in the blood) have been considered a risk factor for pancreatitis (inflammation of the pancreas) and these symptoms may suggest this condition.
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– Joint stiffness, aches and pains (especially of the hip, knee and shoulder) and difficulty in movement as some patients taking these medicines may develop a bone disease called osteonecrosis (death of bone tissue caused by loss of blood supply to the bone). The length of combination antiretroviral therapy, corticosteroid use, alcohol consumption, severe immunosuppression (reduction in the activity of the immune system), higher body mass index, among others, may be some of the many risk factors for developing this disease.
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- Heart medicines including:
  - Digoxin;
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- Warfarin.
- Medicines that cause a reaction with alcohol (e.g. disulfiram).

Read the list of medicines under ‘Do not take Kaletra with any of the following medicines’ for information on medicines that you must not take with Kaletra.

Please tell your doctor or pharmacist if you are taking or have recently taken any other medicines, including medicines obtained without prescription.

Erectile dysfunction medicines (vardenafil, sildenafil, tadalafil)

- Do not take Kaletra if you are currently taking vardenafil.
- You must not take Kaletra with sildenafil used to treat pulmonary arterial hypertension (see also Do not take Kaletra section).
- If you take sildenafil or tadalafil and Kaletra together, you may be at risk of side effects such as low blood pressure, passing out, visual changes and penile erection lasting more than 4 hours. If an erection lasts longer than 4 hours, you should get medical help immediately to avoid permanent damage to your penis. Your doctor can explain these symptoms to you.

Contraceptives

- If you are currently using an oral contraceptive or using a patch contraceptive to prevent pregnancy, you should use an additional or different type of contraception (e.g. condom) as Kaletra may reduce the effectiveness of oral and patch contraceptives.
- Kaletra does not reduce the risk of passing HIV to others. Appropriate precautions (e.g. use of a condom) should be taken to prevent passing on the disease through sexual contact.
Taking Kaletra with food and drink

It is important that Kaletra is taken with food.

Pregnancy and breast-feeding

− Tell your doctor immediately if you are pregnant, think you may be pregnant or if you are breast-feeding.
− Pregnant or breast-feeding mothers should not take Kaletra unless specifically directed by the doctor.
− It is recommended that HIV-infected women do not breast-feed their infants because there is a possibility that the baby can be infected with HIV through your breast milk.

Driving or using machines

Kaletra has not specifically been tested for its possible effects on the ability to drive a car or operate machines. Do not drive a car or operate machinery if you experience any side effects (e.g. nausea) that impact your ability to do so safely. Instead, contact your doctor.

Kaletra contains 42% v/v alcohol.

Important information about some of the ingredients of Kaletra

Kaletra contains 42% v/v alcohol. Each dose contains up to 1.7 g of alcohol. Potentially harmful for those suffering from liver disease, alcoholism, epilepsy, brain injury or disease as well as for pregnant women and children. May modify or increase the effect of other medicines.

This medicinal product contains up to 0.8 g of fructose per dose when taken according to the dosage recommendations. Unsuitable in hereditary fructose intolerance. Due to the possibility of undetected fructose intolerance, this medicinal product should only be given to babies and infants after consultation with a physician.

Kaletra contains glycerol which is harmful in high doses. Can cause headache and stomach upset and diarrhoea.

Kaletra contains polyoxyl 40 hydrogenated castor oil. This may cause nausea, vomiting, colic, severe purgation at high doses. It should not be given when intestinal obstruction is present.

Kaletra contains potassium as acesulfame potassium, which may be harmful to people on a low potassium diet. High potassium in the blood can cause stomach upset and diarrhoea.

Kaletra contains sodium as saccharin sodium, sodium chloride and sodium citrate, which may be harmful to people on a low sodium diet.

3. HOW TO TAKE KALETRA

Kaletra is recommended for use in adults and children 2 years of age or older who are infected with HIV.

Take care when dosing children. Dosing should be less that 5 ml twice daily for children weighing less that 40 kg.

− It is important that all doses of Kaletra oral solution are taken with food.
− Always take Kaletra exactly as your doctor has told you.
− You should check with your doctor or pharmacist if you are not sure how you should take your medicine.
How much Kaletra should be taken and when?

- The usual adult dose is 5 ml of the oral solution twice a day i.e. every 12 hours, in combination with other anti-HIV medicines. Your doctor will advise on the amount of Kaletra to be taken.
- For children, your doctor will decide the right dose based on the child’s height and weight.
- Kaletra is also supplied as film-coated tablets containing 200 mg of lopinavir and 50 mg of ritonavir and film-coated tablets containing 100 mg of lopinavir and 25 mg of ritonavir.

Can I stop taking Kaletra or change my dose?

- Do not stop or change the daily dose of Kaletra without first consulting with your doctor.
- Kaletra should always be taken twice every day to help control your HIV infection, no matter how much better you feel.
- Using Kaletra as recommended should give you the best chance of delaying the development of resistance to the product.
- If a side effect is preventing you from taking Kaletra as directed tell your doctor right away.
- Always keep enough Kaletra on hand so you don’t run out. When you travel or need to stay in the hospital make sure you will have enough Kaletra to last until you can get a new supply.
- Continue to take this medicine until your doctor tells you otherwise.

How do I measure the correct dose of the solution?

Open the child-proof cap by pushing down on it with your palm and twisting it counter clockwise, or in the direction of the arrow. Talk to you pharmacist if you have difficulty opening the bottle.

5 dosing syringes are included in each carton of Kaletra oral solution. Ask your pharmacist for instructions on how to use the syringe correctly.

After each dose of Kaletra separate the plunger and the syringe. Wash the plunger and the syringe with dish soap and warm water as soon as you can; you may soak both in soapy water for up to 15 minutes. Rinse the syringe and plunger with clean water. Put the syringe back together and draw up and expel tap water a few times to rinse. Let the syringe dry completely before you use that syringe for dosing.

If you take more Kaletra than you should

- If you realise you have taken more Kaletra than you were supposed to, contact you doctor right away.
- If you cannot contact your doctor, go to the hospital.

If you forget to take Kaletra

- If you miss a dose, take the missed dose as soon as possible together with some food, and then continue with your normal dose on the regular schedule as prescribed by your doctor.
- Do not take a double dose to make up for a forgotten dose.
4. POSSIBLE SIDE EFFECTS

Like all medicines, Kaletra can cause side effects, although not everybody gets them. It may be difficult to tell which side effects have been caused by Kaletra and which may occur due to other medicines you take at the same time or by the complications of the HIV infection.

You should tell your doctor promptly about these or any other symptoms. If the condition persists or worsens, seek medical attention.

**VERY COMMON** side effects (affects more than 1 user in 10):

- Diarrhoea;
- Nausea;
- Upper respiratory tract infection.

**COMMON** side effects (affects 1 to 10 users in 100):

- Inflammation of the pancreas;
- Vomiting, enlarged abdomen, pain in the lower and upper stomach area, passing wind, indigestion, decreased appetite, reflux from your stomach to your oesophagus which may cause pain;
- Swelling or inflammation of the stomach, intestines and colon;
- Increased cholesterol levels in your blood, increased triglycerides (a form of fat) levels in your blood, high blood pressure;
- Decreased ability of the body to handle sugar including diabetes mellitus, weight loss;
- Low number of red blood cells, low number of white blood cells which are usually used to fight infection;
- Rash, eczema, accumulation of scales of greasy skin;
- Dizziness, anxiety, difficulty in sleeping;
- Feeling tired, lack of strength and energy, headache including migraine;
- Haemorrhoids;
- Inflammation of the liver including increased liver enzymes;
- Allergic reactions including hives and inflammation in the mouth;
- Changes in body shape or face shape due to changes in fat distribution;
- Lower respiratory tract infection;
- Enlargement of the lymph nodes;
- Impotence, abnormally heavy or extended menstrual flow or a lack of menstruation;
- Muscle disorders such as weakness and spasms, pain in the joints, muscles and back;
- Damage to nerves of the peripheral nervous system;
- Night sweats, itching, rash including raised bumps on the skin, infection of the skin, inflammation of skin or hair pores, accumulation of fluid in the cells or tissues.

**Further information about nausea, vomiting or abdominal pain**

Tell your doctor if you experience nausea, vomiting or abdominal pain as these may be suggestive of pancreatitis (inflammation of the pancreas).

**Further information about increased cholesterol and triglycerides**

- The long-term risks for complications such as heart attacks or stroke due to increased triglycerides and cholesterol are not known at this time.
- Your doctor will monitor you and may prescribe other medicines if needed.
- Large increases in the amount of triglycerides (fats in the blood) have been considered a risk factor for pancreatitis (inflammation of the pancreas).

**Changes in body shape due to changes in fat distribution**

Combination antiretroviral therapy may cause changes in body shape due to changes in fat distribution. These may include loss of fat from legs, arms and face, increased fat in the abdomen (belly) and other internal organs, breast enlargement and fatty lumps on the back of the neck (‘buffalo hump’). The cause and long-term health effects of these conditions are not known at this time.

Tell your doctor if you notice any changes in your body shape due to changes in fat distribution.
**UNCOMMON** side effects (affects 1 to 10 users in 1,000):
- Abnormal dreams;
- Loss or changed sense of taste;
- Hair loss;
- An abnormality in your electrocardiogram called atrioventricular block;
- Plaque building up inside your arteries which could lead to heart attack and stroke;
- Inflammation of blood vessels and capillaries;
- Inflammation of the bile duct;
- Uncontrolled shaking of the body;
- Constipation;
- Deep vein inflammation related to a blood clot;
- Dry mouth;
- Inability to control your bowels;
- Inflammation of the first section of the small intestine just after the stomach, wound or ulcer in the digestive tract, bleeding from the intestinal tract or rectum;
- Red blood cells in the urine;
- Fatty deposits in the liver, enlarged liver;
- Lack of functioning of the testes;
- A flare-up of symptoms related to an inactive infection in your body (immune reconstitution);
- Increased appetite;
- Abnormally high level of bilirubin (a pigment produced from the breakdown of red blood cells) in the blood
- Decreased sexual desire;
- Inflammation of the kidney;
- Bone death caused by poor blood supply to the area;
- Mouth sores or ulcerations, inflammation of the stomach and intestine;
- Kidney failure;
- Breakdown of muscle fibbers resulting in the release of muscle fiber contents (myoglobin) into the bloodstream;
- A sound in one ear or both ears, such as buzzing, ringing or whistling;
- Tremor;
- Abnormal closure of one of the valves (tricuspid valve in your heart);
- Vertigo (spinning feeling);
- Eye disorder, abnormal vision;
- Weight gain.

Other side effects that have been reported with Kaletra: yellowing of the skin or whites of eyes (jaundice), severe or life threatening skin rashes and blisters (Stevens-Johnson syndrome and erythema multiforme). It is not known how frequently these effects may occur.

If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please inform your doctor or pharmacist.

5. **HOW TO STORE KALETRA**

- Keep out of the reach and sight of children.
- Do not use Kaletra after the expiry date which is stated on the bottle. The expiry date refers to the last day of that month.
How should I store Kaletra and for how long?

- Store in a refrigerator (2°C - 8°C).
- In use storage: If kept outside of the refrigerator, do not store above 25°C and discard any unused contents after 42 days (6 weeks). It is advised to write the date of removal from the refrigerator on the package.
- Avoid exposure to excessive heat.
- It is important to keep Kaletra in the bottle it came in. Do not transfer it to any other container.

How should I dispose of any unused Kaletra?

- Medicines should not be disposed of via wastewater or household waste.
- Ask your pharmacist how to dispose of medicines not longer required. These measures will help protect the environment.

6. FURTHER INFORMATION

What Kaletra contains

The active substances are lopinavir and ritonavir.
Each ml of Kaletra contains 80 mg of lopinavir and 20 mg of ritonavir.

The other ingredients are:

Alcohol, high fructose corn syrup, propylene glycol, purified water, glycerol, povidone, magnasweet-110 flavour (mixture of monoammonium glycyrrhizinate and glycerol), vanilla flavour (containing p-hydroxybenzoic acid, p-hydroxybenzaldehyde, vanillic acid, vanillin, heliotrope, ethyl vanillin), polyoxyl 40 hydrogenated castor oil, cotton candy flavour (containing ethyl maltol, ethyl vanillin, acetoin, dihydrocoumarin, propylene glycol), acesulfame potassium, saccharin sodium, sodium chloride, peppermint oil, sodium citrate, citric acid, menthol.

What Kaletra look like and contents of the pack

- Kaletra oral solution comes in a multiple-dose 60 ml amber bottle.
- Five bottles containing 60 ml are provided in one package.
- Each ml of Kaletra contains 80 mg of lopinavir and 20 mg of ritonavir.

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This leaflet was last approved in: {MM/YYYY}
KALETRA 200 mg/50 mg film-coated tablets
lopinavir/ritonavir

Read all of this leaflet carefully before you start taking this medicine.

− Keep this leaflet. You may need to read it again.
− If you have any further questions, please ask your doctor or pharmacist
− This medicine has been prescribed for you. Do not pass it onto others. It may harm them, even if their symptoms are the same as yours.
− If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please tell your doctor or pharmacist.

In this leaflet:
1. What Kaletra is and what it is used for
2. Before you take Kaletra
3. How to take Kaletra
4. Possible side effects
5. How to store Kaletra
6. Further information

1. WHAT KALETRA IS AND WHAT IT IS USED FOR

− Your doctor has prescribed Kaletra to help to control your Human Immunodeficiency Virus (HIV) infection. Kaletra does this by slowing down the spread of the infection in your body.
− Kaletra is used by children 2 years of age or older and adults who are infected with HIV, the virus which causes AIDS. Kaletra should not be administered to children younger than 2 years of age unless specifically directed by their doctor.
− Kaletra is an antiretroviral medicine. It belongs to a group of medicines called protease inhibitors.
− Kaletra is prescribed for use in combination with other antiviral medicines. Your doctor will determine which medicines are best for you.

2. BEFORE YOU TAKE KALETRA

Do not take Kaletra

− if you are allergic (hypersensitive) to lopinavir, ritonavir or any of the other ingredients of Kaletra.
− if you have severe liver problems

Do not take Kaletra with any of the following medicines:
− Astemizole or terfenadine (commonly used to treat allergy symptoms – these medicines may be available without prescription);
− Midazolam taken orally (taken by mouth), triazolam (used to relieve anxiety and/or trouble sleeping);
− Pimozide (used to treat schizophrenia);
− Cisapride (used to relieve certain stomach problems);
− Ergotamine, dihydroergotamine, ergonovine, methylergonovine (used to treat headaches);
− Amiodarone (used to treat abnormal heart beat);
− Lovastatin, simvastatin (used to lower blood cholesterol);
− Vardenafil (used to treat erectile dysfunction);
− Sildenafil (used to treat pulmonary arterial hypertension). Sildenafil used to treat erectile dysfunction may be taken under doctor’s supervision (see Take special care with Kaletra section);
− Products that contain St John’s wort (Hypericum perforatum).

Read the list of medicines under ‘Taking other medicines’ for information on certain other medicines which require special care.

If you are currently taking any of these medicines, ask your doctor about switching to another medicine while you are taking Kaletra.

Take special care with Kaletra

Important information
− Kaletra is not a cure for HIV infection or AIDS.
− People taking Kaletra may still develop infections or other illnesses associated with HIV disease and AIDS. It is therefore important that you remain under the supervision of your doctor while taking Kaletra.
− Kaletra does not reduce the risk of passing HIV to others. Appropriate precautions should be taken to prevent passing the disease through sexual contact (e.g. use of a condom) or blood contamination.

Tell your doctor if you have/had:
− Haemophilia type A and B as Kaletra might increase the risk of bleeding.
− Diabetes as increased blood sugars have been reported in patients receiving Kaletra.
− A history of liver problems as patients with a history of liver disease, including chronic hepatitis B or C are at increased risk of severe and potentially fatal liver side effects.

Tell your doctor if you experience:
− Nausea, vomiting, abdominal pain, difficulty breathing and severe weakness of the muscles in the legs and arms as these symptoms may indicate raised lactic acid levels.
− Thirst, frequent urination, blurred vision or weight loss as this may indicate raised sugar levels in the blood.
− Nausea, vomiting, abdominal pain as large increases in the amount of triglycerides (fats in the blood) have been considered a risk factor for pancreatitis (inflammation of the pancreas) and these symptoms may suggest this condition.
− Changes in body shape due to changes in fat distribution. These may include loss of fat from legs, arms and face, increased fat in the abdomen (belly) and other internal organs, breast enlargement and fatty lumps on the back of the neck (‘buffalo hump’). The cause and long-term health effects of these conditions are not known at this time.
− Signs and symptoms of inflammation from previous infections soon after anti-HIV treatment is started. It is believed that these symptoms are due to an improvement in the body’s immune response, enabling the body to fight infections that may have been present with no obvious symptoms.
− Joint stiffness, aches and pains (especially of the hip, knee and shoulder) and difficulty in movement as some patients taking these medicines may develop a bone disease called osteonecrosis (death of bone tissue caused by loss of blood supply to the bone). The length of combination antiretroviral therapy, corticosteroid use, alcohol consumption, severe immunosuppression (reduction in the activity of the immune system), higher body mass index, among others, may be some of the many risk factors for developing this disease.
− Muscle pain, tenderness or weakness, particularly in combination with these medicines. On rare occasions these muscle disorders have been serious.
Taking other medicines

Tell your doctor if you are taking any of the medicines listed below, as special care should then be taken:

− Antibiotics (e.g. rifabutin, rifampicin, clarithromycin);
− Anticancer medicines (e.g. most tyrosine kinases inhibitors such as dasatinib and nilotinib, also vincristine and vinblastine);
− Antidepressants (e.g. trazodone, bupropion);
− Anti-epilepsy medicines (e.g. carbamazepine, phenytoin, phenobarbital);
− Antifungals (e.g. ketoconazole, itraconazole, voriconazole);
− Erectile dysfunction medicines (e.g. sildenafil and tadalafil);
− Heart medicines including:
  − Digoxin;
  − Calcium channel antagonists (e.g. felodipine, nifedipine, nicardipine);
  − Medicines used to correct heart rhythm (e.g. bepridil, systemic lidocaine, quinidine);
− Medicines to lower blood cholesterol (e.g. atorvastatin, lovastatin, rosuvastatin or simvastatin);
− Medicines affecting the immune system (e.g. cyclosporin, sirolimus (rapamycin), tacrolimus);
− Medicines used for smoking cessation (e.g. bupropion);
− Pain-relieving medicines (e.g. fentanyl);
− Morphine-like medicines (e.g. methadone);
− Non-nucleoside reverse transcriptase inhibitors (NNRTIs) (e.g. efavirenz, nevirapine);
− Oral contraceptive or using a patch contraceptive to prevent pregnancy (see section below titled Contraceptives);
− Protease inhibitors (e.g. amprenavir, fosamprenavir, indinavir, nelfinavir, ritonavir, saquinavir, tipranavir);
− Sedatives (e.g. midazolam administered by injection);
− Steroids (e.g. dexamethasone, fluticasone propionate, ethinyl oestradiol);
− Warfarin.

Read the list of medicines under ‘Do not take Kaletra with any of the following medicines’ for information on medicines that you must not take with Kaletra.

Please tell your doctor or pharmacist if you are taking or have recently taken any other medicines, including medicines obtained without prescription.

Erectile dysfunction medicines (vardenafil, sildenafil, tadalafil)

− Do not take Kaletra if you are currently taking vardenafil.
− You must not take Kaletra with sildenafil used to treat pulmonary arterial hypertension (see also Do not take Kaletra section).
− If you take sildenafil or tadalafil and Kaletra together, you may be at risk of side effects such as low blood pressure, passing out, visual changes and penile erection lasting more than 4 hours. If an erection lasts longer than 4 hours, you should get medical help immediately to avoid permanent damage to your penis. Your doctor can explain these symptoms to you.

Contraceptives

− If you are currently using an oral contraceptive or using a patch contraceptive to prevent pregnancy, you should use an additional or different type of contraception (e.g. condom) as Kaletra may reduce the effectiveness of oral and patch contraceptives.
− Kaletra does not reduce the risk of passing HIV to others. Appropriate precautions (e.g. use of a condom) should be taken to prevent passing on the disease through sexual contact.
Taking Kaletra with food and drink

Kaletra tablets can be taken with or without food.

Pregnancy and breast-feeding

- Tell your doctor immediately if you are pregnant, think you may be pregnant or if you are breast-feeding.
- Pregnant or breast-feeding mothers should not take Kaletra unless specifically directed by the doctor.
- It is recommended that HIV-infected women do not breast-feed their infants because there is a possibility that the baby can be infected with HIV through your breast milk.

Driving or using machines

Kaletra has not specifically been tested for its possible effects on the ability to drive a car or operate machines. Do not drive a car or operate machinery if you experience any side effects (e.g. nausea) that impact your ability to do so safely. Instead, contact your doctor.

3. HOW TO TAKE KALETRA

How should Kaletra be taken?

- Kaletra tablets can be taken with or without food.
- Always take Kaletra exactly as your doctor has told you.
- You should check with your doctor or pharmacist if you are not sure how you should take your medicine.

How much Kaletra should be taken and when?

- The usual adult dose is 400 mg/100 mg twice a day i.e. every 12 hours, in combination with other anti-HIV medicines. Adult patients who have not previously taken other antiviral medicines can also take Kaletra tablets once daily as an 800 mg/200 mg dose. Your doctor will advise on the number of tablets to be taken. Adult patients who have previously taken other antiviral medicines can take Kaletra tablets once daily as an 800 mg/200 mg dose if their doctor decides it is appropriate.
- Kaletra must not be taken once daily with amprenavir, efavirenz, nevirapine, nelfinavir, carbamazepine, phenobarbital and phenytoin.
- For children, your doctor will decide the right dose (number of tablets) based on the child’s height and weight.
- Kaletra is also supplied as 100 mg/25 mg film-coated tablets. Kaletra oral solution is available for patients who cannot take tablets.

Can I stop taking Kaletra or change my dose?

- Do not stop or change the daily dose of Kaletra without first consulting with your doctor.
- Kaletra should always be taken every day to help control your HIV infection, no matter how much better you feel.
- Using Kaletra as recommended should give you the best chance of delaying the development of resistance to the product.
- If a side effect is preventing you from taking Kaletra as directed tell your doctor right away.
Always keep enough Kaletra on hand so you don’t run out. When you travel or need to stay in the hospital make sure you will have enough Kaletra to last until you can get a new supply.

Continue to take this medicine until your doctor tells you otherwise.

If you take more Kaletra than you should

- If you realise you have taken more Kaletra than you were supposed to, contact your doctor right away.
- If you cannot contact your doctor, go to the hospital.

If you forget to take Kaletra

- If you miss a dose, take the missed dose as soon as possible, and then continue with your normal dose on the regular schedule as prescribed by your doctor.
- Do not take a double dose to make up for a forgotten dose.

4. POSSIBLE SIDE EFFECTS

Like all medicines, Kaletra can cause side effects, although not everybody gets them. It may be difficult to tell which side effects have been caused by Kaletra and which may occur due to other medicines you take at the same time or by the complications of the HIV infection.

You should tell your doctor promptly about these or any other symptoms. If the condition persists or worsens, seek medical attention.

**VERY COMMON** side effects (affects more than 1 user in 10):
- Diarrhoea;
- Nausea;
- Upper respiratory tract infection.

**COMMON** side effects (affects 1 to 10 users in 100):
- Inflammation of the pancreas;
- Vomiting, enlarged abdomen, pain in the lower and upper stomach area, passing wind, indigestion, decreased appetite, reflux from your stomach to your oesophagus which may cause pain;
- Swelling or inflammation of the stomach, intestines and colon;
- Increased cholesterol levels in your blood, increased triglycerides (a form of fat) levels in your blood, high blood pressure;
- Decreased ability of the body to handle sugar including diabetes mellitus, weight loss;
- Low number of red blood cells, low number of white blood cells which are usually used to fight infection;
- Rash, eczema, accumulation of scales of greasy skin;
- Dizziness, anxiety, difficulty in sleeping;
- Feeling tired, lack of strength and energy, headache including migraine;
- Haemorrhoids;
- Inflammation of the liver including increased liver enzymes;
- Allergic reactions including hives and inflammation in the mouth;
- Changes in body shape or face shape due to changes in fat distribution;
- Lower respiratory tract infection;
- Enlargement of the lymph nodes;
- Impotence, abnormally heavy or extended menstrual flow or a lack of menstruation;
- Muscle disorders such as weakness and spasms, pain in the joints, muscles and back;
- Damage to nerves of the peripheral nervous system;
- Night sweats, itching, rash including raised bumps on the skin, infection of the skin, inflammation of skin or hair pores, accumulation of fluid in the cells or tissues.
Further information about nausea, vomiting or abdominal pain
Tell your doctor if you experience nausea, vomiting or abdominal pain as these may be suggestive of pancreatitis (inflammation of the pancreas).

Further information about increased cholesterol and triglycerides
- The long-term risks for complications such as heart attacks or stroke due to increased triglycerides and cholesterol are not known at this time.
- Your doctor will monitor you and may prescribe other medicines if needed.
- Large increases in the amount of triglycerides (fats in the blood) have been considered a risk factor for pancreatitis (inflammation of the pancreas).

Changes in body shape due to changes in fat distribution
Combination antiretroviral therapy may cause changes in body shape due to changes in fat distribution. These may include loss of fat from legs, arms and face, increased fat in the abdomen (belly) and other internal organs, breast enlargement and fatty lumps on the back of the neck (‘buffalo hump’). The cause and long-term health effects of these conditions are not known at this time.
Tell your doctor if you notice any changes in your body shape due to changes in fat distribution.

UNCOMMON side effects (affects 1 to 10 users in 1,000):
- Abnormal dreams;
- Loss or changed sense of taste;
- Hair loss;
- An abnormality in your electrocardiogram called atrioventricular block;
- Plaque building up inside your arteries which could lead to heart attack and stroke;
- Inflammation of blood vessels and capillaries;
- Inflammation of the bile duct;
- Uncontrolled shaking of the body;
- Constipation;
- Deep vein inflammation related to a blood clot;
- Dry mouth;
- Inability to control your bowels;
- Inflammation of the first section of the small intestine just after the stomach, wound or ulcer in the digestive tract, bleeding from the intestinal tract or rectum;
- Red blood cells in the urine;
- Fatty deposits in the liver, enlarged liver;
- Lack of functioning of the testes;
- A flare-up of symptoms related to an inactive infection in your body (immune reconstitution);
- Increased appetite;
- Abnormally high level of bilirubin (a pigment produced from the breakdown of red blood cells) in the blood
- Decreased sexual desire;
- Inflammation of the kidney;
- Bone death caused by poor blood supply to the area;
- Mouth sores or ulcerations, inflammation of the stomach and intestine;
- Kidney failure;
- Breakdown of muscle fibbers resulting in the release of muscle fiber contents (myoglobin) into the bloodstream;
- A sound in one ear or both ears, such as buzzing, ringing or whistling;
- Tremor;
- Abnormal closure of one of the valves (tricuspid valve in your heart);
- Vertigo (spinning feeling);
- Eye disorder, abnormal vision;
- Weight gain.
Other side effects that have been reported with Kaletra: yellowing of the skin or whites of eyes (jaundice), severe or life threatening skin rashes and blisters (Stevens-Johnson syndrome and erythema multiforme). It is not known how frequently these effects may occur.

If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please inform your doctor or pharmacist.

5. HOW TO STORE KALETRA

− As with all medicines, keep Kaletra out of the reach and sight of children.
− Do not use Kaletra after the expiry date which is stated on the pack.
− This medicinal product does not require any special storage conditions.

How should I dispose of any unused Kaletra?

− Medicines should not be disposed of via wastewater or household waste.
− Ask your pharmacist how to dispose of medicines not longer required.
These measures will help protect the environment.

6. FURTHER INFORMATION

What Kaletra contains

The active substances are lopinavir and ritonavir.
Each tablet of Kaletra contains 200 mg of lopinavir and 50 mg of ritonavir

The other ingredients are:

Tablet
Copovidone, sorbitan laurate, colloidal anhydrous silica, sodium stearyl fumarate.

Tablet coating
Hypromellose, titanium dioxide, macrogols type 400 (polyethylene glycol 400), hydroxypropyl cellulose, talc, colloidal anhydrous silica, macrogols type 3350 (polyethylene glycol 3350), yellow ferric oxide E172, polysorbate 80.

What Kaletra looks like and contents of the pack

− Kaletra film-coated tablets come in a plastic bottle containing 120 tablets.
− The tablets are yellow embossed with [Abbott logo] and “KA”.
− There are 2 pack sizes available:
  - 1 bottle of 120 tablets provided in one package
  - 3 bottles of 120 tablets (360 tablets) provided in one package
− Kaletra film-coated tablets are also supplied in blisters.
− There are 2 pack sizes available:
  - 1 carton containing 10 foil blisters of 12 tablets (120 tablets).
  - 3 cartons each containing 5 foil blisters of 8 tablets (40 tablets). The pack contains 3 cartons (120 tablets).

Not all pack sizes may be marketed.

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This leaflet was last approved on: {MM/YYYY}
1. WHAT KALETRA IS AND WHAT IT IS USED FOR

Your doctor has prescribed Kaletra to help to control your Human Immunodeficiency Virus (HIV) infection. Kaletra does this by slowing down the spread of the infection in your body.

Kaletra is used by children 2 years of age or older and adults who are infected with HIV, the virus which causes AIDS. Kaletra should not be administered to children younger than 2 years of age unless specifically directed by their doctor.

Kaletra is an antiretroviral medicine. It belongs to a group of medicines called protease inhibitors.

Kaletra is prescribed for use in combination with other antiviral medicines. Your doctor will determine which medicines are best for you.

2. BEFORE YOU TAKE KALETRA

Do not take Kaletra:

- If you are allergic (hypersensitive) to lopinavir, ritonavir or any of the other ingredients of Kaletra.
- If you have severe liver problems.

Do not take Kaletra with any of the following medicines:

- Astemizole or terfenadine (commonly used to treat allergy symptoms – these medicines may be available without prescription);
- Midazolam taken orally (taken by mouth), triazolam (used to relieve anxiety and/or trouble sleeping);
- Pimozide (used to treat schizophrenia);
- Cisapride (used to relieve certain stomach problems);
- Ergotamine, dihydroergotamine, ergonovine, methylergonovine (used to treat headaches);
- Amiodarone (used to treat abnormal heart beat);
- Lovastatin, simvastatin (used to lower blood cholesterol);
- Vardenafil (used to treat erectile dysfunction);
- Sildenafil (used to treat pulmonary arterial hypertension). Sildenafil used to treat erectile dysfunction may be taken under doctor’s supervision (see Take special care with Kaletra section);
– Products that contain St John’s wort (Hypericum perforatum).

**Read the list of medicines under ‘Taking other medicines’** for information on certain other medicines which require special care.

If you are currently taking any of these medicines, ask your doctor about switching to another medicine while you are taking Kaletra.

**Take special care with Kaletra**

**Important information**

– Kaletra is not a cure for HIV infection or AIDS.
– People taking Kaletra may still develop infections or other illnesses associated with HIV disease and AIDS. It is therefore important that you remain under the supervision of your doctor while taking Kaletra.
– Kaletra **does not reduce the risk of passing HIV to others**. Appropriate precautions should be taken to prevent passing the disease through sexual contact (e.g. use of a condom) or blood contamination.

**Tell your doctor if you have/had:**

– **Haemophilia** type A and B as Kaletra might increase the risk of bleeding.
– **Diabetes** as increased blood sugars have been reported in patients receiving Kaletra.
– A history of **liver problems** as patients with a history of liver disease, including chronic hepatitis B or C are at increased risk of severe and potentially fatal liver side effects.

**Tell your doctor if you experience:**

– Nausea, vomiting, abdominal pain, difficulty breathing and severe weakness of the muscles in the legs and arms as these symptoms may indicate raised lactic acid levels.
– Thirst, frequent urination, blurred vision or weight loss as this may indicate raised sugar levels in the blood.
– Nausea, vomiting, abdominal pain as large increases in the amount of triglycerides (fats in the blood) have been considered a risk factor for pancreatitis (inflammation of the pancreas) and these symptoms may suggest this condition.
– **Changes in body shape** due to changes in fat distribution. These may include loss of fat from legs, arms and face, increased fat in the abdomen (belly) and other internal organs, breast enlargement and fatty lumps on the back of the neck (‘buffalo hump’). The cause and long-term health effects of these conditions are not known at this time.
– **Signs and symptoms of inflammation** from previous infections soon after anti-HIV treatment is started. It is believed that these symptoms are due to an improvement in the body’s immune response, enabling the body to fight infections that may have been present with no obvious symptoms.
– **Joint stiffness, aches and pains** (especially of the hip, knee and shoulder) and difficulty in movement as some patients taking these medicines may develop a bone disease called osteonecrosis (death of bone tissue caused by loss of blood supply to the bone). The length of combination antiretroviral therapy, corticosteroid use, alcohol consumption, severe immunosuppression (reduction in the activity of the immune system), higher body mass index, among others, may be some of the many risk factors for developing this disease.
– **Muscle pain**, tenderness or weakness, particularly in combination with these medicines. On rare occasions these muscle disorders have been serious.
Taking other medicines

Tell your doctor if you are taking any of the medicines listed below, as special care should then be taken:

- Antibiotics (e.g. rifabutin, rifampicin, clarithromycin);
- Anticancer medicines (e.g. most tyrosine kinases inhibitors such as dasatinib and nilotinib, also vincristine and vinblastine);
- Antidepressants (e.g. trazodone, bupropion);
- Anti-epilepsy medicines (e.g. carbamazepine, phenytoin, phenobarbital);
- Antifungals (e.g. ketoconazole, itraconazole, voriconazole);
- Erectile dysfunction medicines (e.g. sildenafil and tadalafil);
- Heart medicines including:
  - Digoxin;
  - Calcium channel antagonists (e.g. felodipine, nifedipine, nicardipine);
  - Medicines used to correct heart rhythm (e.g. bepridil, systemic lidocaine, quinidine);
- Medicines used to lower blood cholesterol (e.g. atorvastatin, lovastatin, rosuvastatin or simvastatin);
- Medicines affecting the immune system (e.g. cyclosporin, sirolimus (rapamycin), tacrolimus);
- Medicines used for smoking cessation (e.g. bupropion);
- Pain-relieving medicines (e.g. fentanyl);
- Morphine-like medicines (e.g. methadone);
- Non-nucleoside reverse transcriptase inhibitors (NNRTIs) (e.g. efavirenz, nevirapine);
- Oral contraceptive or using a patch contraceptive to prevent pregnancy (see section below titled Contraceptives);
- Protease inhibitors (e.g. amprenavir, fosamprenavir, indinavir, nelfinavir, ritonavir, saquinavir, tipranavir);
- Sedatives (e.g. midazolam administered by injection);
- Steroids (e.g. dexamethasone, fluticasone propionate, ethinyl oestradiol);
- Warfarin.

Read the list of medicines under ‘Do not take Kaletra with any of the following medicines’ for information on medicines that you must not take with Kaletra.

Please tell your doctor or pharmacist if you are taking or have recently taken any other medicines, including medicines obtained without prescription.

Erectile dysfunction medicines (vardenafil, sildenafil, tadalafil)

- Do not take Kaletra if you are currently taking vardenafil.
- You must not take Kaletra with sildenafil used to treat pulmonary arterial hypertension (see also Do not take Kaletra section).
- If you take sildenafil or tadalafil and Kaletra together, you may be at risk of side effects such as low blood pressure, passing out, visual changes and penile erection lasting more than 4 hours. If an erection lasts longer than 4 hours, you should get medical help immediately to avoid permanent damage to your penis. Your doctor can explain these symptoms to you.

Contraceptives

- If you are currently using an oral contraceptive or using a patch contraceptive to prevent pregnancy, you should use an additional or different type of contraception (e.g. condom) as Kaletra may reduce the effectiveness of oral and patch contraceptives.
- Kaletra does not reduce the risk of passing HIV to others. Appropriate precautions (e.g. use of a condom) should be taken to prevent passing on the disease through sexual contact.
Taking Kaletra with food and drink

Kaletra tablets can be taken with or without food.

Pregnancy and breast-feeding

− Tell your doctor immediately if you are pregnant, think you may be pregnant or if you are breast-feeding.
− Pregnant or breast-feeding mothers should not take Kaletra unless specifically directed by the doctor.
− It is recommended that HIV-infected women do not breast-feed their infants because there is a possibility that the baby can be infected with HIV through your breast milk.

Driving or using machines

Kaletra has not specifically been tested for its possible effects on the ability to drive a car or operate machines. Do not drive a car or operate machinery if you experience any side effects (e.g. nausea) that impact your ability to do so safely. Instead, contact your doctor.

3. HOW TO TAKE KALETRA

How should Kaletra be taken?

| It is important that Kaletra tablets are swallowed whole and not chewed, broken or crushed. |

− Kaletra tablets can be taken with or without food.
− Always take Kaletra exactly as your doctor has told you.
− You should check with your doctor or pharmacist if you are not sure how you should take your medicine.

How much Kaletra should be taken and when?

− The usual adult dose is 400 mg/100 mg twice a day i.e. every 12 hours, in combination with other anti-HIV medicines. Adult patients who have not previously taken other antiviral medicines can also take Kaletra tablets once daily as an 800 mg/200 mg dose. Your doctor will advise on the number of tablets to be taken. Adult patients who have previously taken other antiviral medicines can take Kaletra tablets once daily as an 800 mg/200 mg dose if their doctor decides it is appropriate.
− Kaletra must not be taken once daily with amprenavir, efavirenz, nevirapine, nelfinavir, carbamazepine, phenobarbital and phenytoin.
− For children, your doctor will decide the right dose (number of tablets) based on the child’s height and weight.
− Kaletra is also supplied as 200 mg/50 mg film-coated tablets. Kaletra oral solution is available for patients who cannot take tablets.

Can I stop taking Kaletra or change my dose?

− Do not stop or change the daily dose of Kaletra without first consulting with your doctor.
− Kaletra should always be taken every day to help control your HIV infection, no matter how much better you feel.
− Using Kaletra as recommended should give you the best chance of delaying the development of resistance to the product.
− If a side effect is preventing you from taking Kaletra as directed tell your doctor right away.
Always keep enough Kaletra on hand so you don’t run out. When you travel or need to stay in the hospital make sure you will have enough Kaletra to last until you can get a new supply.

Continue to take this medicine until your doctor tells you otherwise.

**If you take more Kaletra than you should**

- If you realise you have taken more Kaletra than you were supposed to, contact your doctor right away.
- If you cannot contact your doctor, go to the hospital.

**If you forget to take Kaletra**

- If you miss a dose, take the missed dose as soon as possible, and then continue with your normal dose on the regular schedule as prescribed by your doctor.
- Do not take a double dose to make up for a forgotten dose.

**4. POSSIBLE SIDE EFFECTS**

Like all medicines, Kaletra can cause side effects, although not everybody gets them. It may be difficult to tell which side effects have been caused by Kaletra and which may occur due to other medicines you take at the same time or by the complications of the HIV infection.

You should tell your doctor promptly about these or any other symptoms. If the condition persists or worsens, seek medical attention.

**VERY COMMON** side effects (affects more than 1 user in 10):
- Diarrhoea;
- Nausea;
- Upper respiratory tract infection.

**COMMON** side effects (affects 1 to 10 users in 100):
- Inflammation of the pancreas;
- Vomiting, enlarged abdomen, pain in the lower and upper stomach area, passing wind, indigestion, decreased appetite, reflux from your stomach to your oesophagus which may cause pain;
- Swelling or inflammation of the stomach, intestines and colon;
- Increased cholesterol levels in your blood, increased triglycerides (a form of fat) levels in your blood, high blood pressure;
- Decreased ability of the body to handle sugar including diabetes mellitus, weight loss;
- Low number of red blood cells, low number of white blood cells which are usually used to fight infection;
- Rash, eczema, accumulation of scales of greasy skin;
- Dizziness, anxiety, difficulty in sleeping;
- Feeling tired, lack of strength and energy, headache including migraine;
- Haemorrhoids;
- Inflammation of the liver including increased liver enzymes;
- Allergic reactions including hives and inflammation in the mouth;
- Changes in body shape or face shape due to changes in fat distribution;
- Lower respiratory tract infection;
- Enlargement of the lymph nodes;
- Impotence, abnormally heavy or extended menstrual flow or a lack of menstruation;
- Muscle disorders such as weakness and spasms, pain in the joints, muscles and back;
- Damage to nerves of the peripheral nervous system;
- Night sweats, itching, rash including raised bumps on the skin, infection of the skin, inflammation of skin or hair pores, accumulation of fluid in the cells or tissues.
Further information about nausea, vomiting or abdominal pain
Tell your doctor if you experience nausea, vomiting or abdominal pain as these may be suggestive of pancreatitis (inflammation of the pancreas).

Further information about increased cholesterol and triglycerides
− The long-term risks for complications such as heart attacks or stroke due to increased triglycerides and cholesterol are not known at this time.
− Your doctor will monitor you and may prescribe other medicines if needed.
− Large increases in the amount of triglycerides (fats in the blood) have been considered a risk factor for pancreatitis (inflammation of the pancreas).

Changes in body shape due to changes in fat distribution
Combination antiretroviral therapy may cause changes in body shape due to changes in fat distribution. These may include loss of fat from legs, arms and face, increased fat in the abdomen (belly) and other internal organs, breast enlargement and fatty lumps on the back of the neck (‘buffalo hump’). The cause and long-term health effects of these conditions are not known at this time. Tell your doctor if you notice any changes in your body shape due to changes in fat distribution.

UNCOMMON side effects (affects 1 to 10 users in 1,000):
− Abnormal dreams;
− Loss or changed sense of taste;
− Hair loss;
− An abnormality in your electrocardiogram called atrioventricular block;
− Plaque building up inside your arteries which could lead to heart attack and stroke;
− Inflammation of blood vessels and capillaries;
− Inflammation of the bile duct;
− Uncontrolled shaking of the body;
− Constipation;
− Deep vein inflammation related to a blood clot;
− Dry mouth;
− Inability to control your bowels;
− Inflammation of the first section of the small intestine just after the stomach, wound or ulcer in the digestive tract, bleeding from the intestinal tract or rectum;
− Red blood cells in the urine;
− Fatty deposits in the liver, enlarged liver;
− Lack of functioning of the testes;
− A flare-up of symptoms related to an inactive infection in your body (immune reconstitution);
− Increased appetite;
− Abnormally high level of bilirubin (a pigment produced from the breakdown of red blood cells) in the blood
− Decreased sexual desire;
− Inflammation of the kidney;
− Bone death caused by poor blood supply to the area;
− Mouth sores or ulcerations, inflammation of the stomach and intestine;
− Kidney failure;
− Breakdown of muscle fibbers resulting in the release of muscle fiber contents (myoglobin) into the bloodstream;
− A sound in one ear or both ears, such as buzzing, ringing or whistling;
− Tremor;
− Abnormal closure of one of the valves (tricuspid valve in your heart);
− Vertigo (spinning feeling);
− Eye disorder, abnormal vision;
− Weight gain.
Other side effects that have been reported with Kaletra: yellowing of the skin or whites of eyes (jaundice), severe or life threatening skin rashes and blisters (Stevens-Johnson syndrome and erythema multiforme). It is not known how frequently these effects may occur.

If any of the side effects gets serious, or if you notice any side effects not listed in this leaflet, please inform your doctor or pharmacist.

5. HOW TO STORE KALETRA

− Keep out of the reach and sight of children.
− Do not use Kaletra after the expiry date which is stated on the pack.
− This medicinal product does not require any special storage conditions.

How should I dispose of any unused Kaletra?

− Medicines should not be disposed of via wastewater or household waste.
− Ask your pharmacist how to dispose of medicines not longer required. These measures will help protect the environment.

6. FURTHER INFORMATION

What Kaletra contains

The active substances are lopinavir and ritonavir.
Each tablet of Kaletra contains 100 mg of lopinavir and 25 mg of ritonavir

The other ingredients are:

Tablet
Colloidal anhydrous silica, copovidone, sodium stearyl fumarate, sorbitan laurate.

Tablet coating
Polyvinyl alcohol, talc, titanium dioxide, macrogols type 3350, yellow ferric oxide E172.

What Kaletra looks like and contents of the pack

− Kaletra film-coated tablets come in a plastic bottle containing 60 tablets.
− The tablets are pale yellow debossed with [Abbott logo] and “KC”.
− One bottle of 60 tablets is provided in one package.

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