

ANNEX I
SUMMARY OF PRODUCT CHARACTERISTICS

1. NAME OF THE MEDICINAL PRODUCT

Lorviqua 25 mg film-coated tablets
Lorviqua 100 mg film-coated tablets

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Lorviqua 25 mg film-coated tablets

Each film-coated tablet contains 25 mg of lorlatinib.

Excipient with known effect

Each film-coated tablet contains 1.58 mg of lactose monohydrate.

Lorviqua 100 mg film-coated tablets

Each film-coated tablet contains 100 mg of lorlatinib.

Excipient with known effect

Each film-coated tablet contains 4.20 mg of lactose monohydrate.

For the full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Film-coated tablet (tablet).

Lorviqua 25 mg film-coated tablets

Round (8 mm) light pink immediate release film-coated tablet, debossed with “Pfizer” on one side and “25” and “LLN” on the other side.

Lorviqua 100 mg film-coated tablets

Oval (8.5 × 17 mm) dark pink immediate release film-coated tablet, debossed with “Pfizer” on one side and “LLN 100” on the other side.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Lorviqua as monotherapy is indicated for the treatment of adult patients with anaplastic lymphoma kinase (ALK)-positive advanced non-small cell lung cancer (NSCLC) previously not treated with an ALK inhibitor.

Lorviqua as monotherapy is indicated for the treatment of adult patients with ALK-positive advanced NSCLC whose disease has progressed after:

- alectinib or ceritinib as the first ALK tyrosine kinase inhibitor (TKI) therapy; or
- crizotinib and at least one other ALK TKI.

4.2 Posology and method of administration

Treatment with lorlatinib should be initiated and supervised by a physician experienced in the use of anticancer medicinal products.

Detection of ALK-positive NSCLC is necessary for selection of patients for treatment with lorlatinib because these are the only patients for whom benefit has been shown. Assessment for ALK-positive NSCLC should be performed by laboratories with demonstrated proficiency in the specific technology being utilised. Improper assay performance can lead to unreliable test results.

Posology

The recommended dose is 100 mg lorlatinib taken orally once daily.

Duration of treatment

Treatment with lorlatinib should be continued until disease progression or unacceptable toxicity.

Delayed or missed doses

If a dose of Lorviqua is missed, then it should be taken as soon as the patient remembers unless it is less than 4 hours before the next dose, in which case the patient should not take the missed dose. Patients should not take 2 doses at the same time to make up for a missed dose.

Dose modifications

Dosing interruption or dose reduction may be required based on individual safety and tolerability. Lorlatinib dose reduction levels are summarised below:

- First dose reduction: 75 mg taken orally once daily
- Second dose reduction: 50 mg taken orally once daily

Lorlatinib should be permanently discontinued if the patient is unable to tolerate the 50 mg dose taken orally once daily.

Dose modification recommendations for toxicities and for patients who develop atrioventricular (AV) block are provided in Table 1.

Table 1. Recommended lorlatinib dose modifications for adverse reactions

Adverse reaction ^a	Lorlatinib dosing
Hypercholesterolaemia or hypertriglyceridaemia	
Mild hypercholesterolaemia (cholesterol between ULN and 300 mg/dL or between ULN and 7.75 mmol/L)	Introduce or modify lipid-lowering therapy ^b in accordance with respective prescribing information; continue lorlatinib at same dose.
<u>OR</u>	
Moderate hypercholesterolaemia (cholesterol between 301 and 400 mg/dL or between 7.76 and 10.34 mmol/L)	
<u>OR</u>	
Mild hypertriglyceridaemia (triglycerides between 150 and 300 mg/dL or 1.71 and 3.42 mmol/L)	
<u>OR</u>	
Moderate hypertriglyceridaemia	

Table 1. Recommended lorlatinib dose modifications for adverse reactions

Adverse reaction^a	Lorlatinib dosing
(triglycerides between 301 and 500 mg/dL or 3.43 and 5.7 mmol/L)	
Severe hypercholesterolaemia (cholesterol between 401 and 500 mg/dL or between 10.35 and 12.92 mmol/L) <u>OR</u> Severe hypertriglyceridaemia (triglycerides between 501 and 1,000 mg/dL or 5.71 and 11.4 mmol/L)	Introduce the use of lipid-lowering therapy ^b ; if currently on lipid-lowering therapy, increase the dose of this therapy ^b in accordance with respective prescribing information; or change to a new lipid-lowering therapy ^b . Continue lorlatinib at the same dose without interruption.
Life-threatening hypercholesterolaemia (cholesterol over 500 mg/dL or over 12.92 mmol/L) <u>OR</u> Life-threatening hypertriglyceridaemia (triglycerides over 1,000 mg/dL or over 11.4 mmol/L)	Introduce the use of lipid-lowering therapy ^b or increase the dose of this therapy ^b in accordance with respective prescribing information or change to a new lipid-lowering therapy ^b . Withhold lorlatinib until recovery of hypercholesterolaemia and/or hypertriglyceridaemia to moderate or mild severity grade. Re-challenge at same lorlatinib dose while maximising lipid-lowering therapy ^b in accordance with respective prescribing information. If severe hypercholesterolaemia and/or hypertriglyceridaemia recur despite maximal lipid-lowering therapy ^b in accordance with respective prescribing information, reduce lorlatinib by 1 dose level.
Central nervous system (CNS) effects (comprises psychotic effects and changes in cognition, mood, mental status or speech)	
Grade 2: Moderate <u>OR</u> Grade 3: Severe	Withhold dose until toxicity is less than or equal to Grade 1. Then resume lorlatinib at 1 reduced dose level.
Grade 4: Life-threatening/Urgent intervention indicated	Permanently discontinue lorlatinib.
Lipase/Amylase increase	
Grade 3: Severe <u>OR</u> Grade 4: Life-threatening/Urgent intervention indicated	Withhold lorlatinib until lipase or amylase returns to baseline. Then resume lorlatinib at 1 reduced dose level.
Interstitial lung disease (ILD)/Pneumonitis	
Grade 1: Mild <u>OR</u> Grade 2: Moderate	Withhold lorlatinib until symptoms have returned to baseline and consider initiating corticosteroids. Resume lorlatinib at 1 reduced dose level. Permanently discontinue lorlatinib if ILD/pneumonitis recurs or fails to recover after 6 weeks of lorlatinib hold and steroid treatment.
Grade 3: Severe <u>OR</u>	Permanently discontinue lorlatinib.

Table 1. Recommended lorlatinib dose modifications for adverse reactions

Adverse reaction ^a	Lorlatinib dosing
Grade 4: Life-threatening/Urgent intervention indicated	
PR interval prolongation/Atrioventricular (AV) block	
First degree AV block: Asymptomatic	Continue lorlatinib at the same dose without interruption. Consider effects of concomitant medicinal products, and assess and correct electrolyte imbalance that may prolong PR interval. Monitor ECG/symptoms potentially related to AV block closely.
First degree AV block: Symptomatic	Withhold lorlatinib. Consider effects of concomitant medicinal products, and assess and correct electrolyte imbalance that may prolong PR interval. Monitor ECG/symptoms potentially related to AV block closely. If symptoms resolve, resume lorlatinib at 1 reduced dose level.
Second degree AV block Asymptomatic	Withhold lorlatinib. Consider effects of concomitant medicinal products, and assess and correct electrolyte imbalance that may prolong PR interval. Monitor ECG/symptoms potentially related to AV block closely. If subsequent ECG does not show second degree AV block, resume lorlatinib at 1 reduced dose level.
Second degree AV block Symptomatic	Withhold lorlatinib. Consider effects of concomitant medicinal products, and assess and correct electrolyte imbalance that may prolong PR interval. Refer for cardiac observation and monitoring. Consider pacemaker placement if symptomatic AV block persists. If symptoms and the second-degree AV block resolve or if patients revert to asymptomatic first-degree AV block, resume lorlatinib at 1 reduced dose level.
Complete AV block	<p>Withhold lorlatinib. Consider effects of concomitant medicinal products, and assess and correct electrolyte imbalance that may prolong PR interval. Refer for cardiac observation and monitoring. Pacemaker placement may be indicated for severe symptoms associated with AV block. If AV block does not resolve, placement of a permanent pacemaker may be considered.</p> <p>If pacemaker placed, resume lorlatinib at full dose. If no pacemaker placed, resume lorlatinib at 1 reduced dose level only when symptoms resolve, and PR interval is less than 200 msec.</p>

Table 1. Recommended lorlatinib dose modifications for adverse reactions

Adverse reaction ^a	Lorlatinib dosing
Hypertension	
Grade 3 (SBP greater than or equal to 160 mmHg or DBP greater than or equal to 100 mmHg; medical intervention indicated; more than one antihypertensive drug, or more intensive therapy than previously used indicated)	<p>Withhold lorlatinib until hypertension has recovered to Grade 1 or less (SBP less than 140 mmHg and DBP less than 90 mmHg), then resume lorlatinib at the same dose.</p> <p>If Grade 3 hypertension recurs, withhold lorlatinib until recovery to Grade 1 or less, and resume at a reduced dose.</p> <p>If adequate hypertension control cannot be achieved with optimal medical management, permanently discontinue lorlatinib.</p>
Grade 4 (Life-threatening consequences, urgent intervention indicated)	<p>Withhold lorlatinib until recovery to Grade 1 or less, and resume at a reduced dose or permanently discontinue lorlatinib.</p> <p>If Grade 4 hypertension recurs, permanently discontinue lorlatinib.</p>
Hyperglycaemia	
Grade 3 <u>OR</u> Grade 4 (Persistent hyperglycaemia greater than 250 mg/dL despite optimal anti-hyperglycaemic therapy)	<p>Withhold lorlatinib until hyperglycaemia is adequately controlled, then resume lorlatinib at the next lower dosage.</p> <p>If adequate hyperglycaemic control cannot be achieved with optimal medical management, permanently discontinue lorlatinib.</p>
Other adverse reactions	
Grade 1: Mild <u>OR</u> Grade 2: Moderate	<p>Consider no dose modification or reduce by 1 dose level, as clinically indicated.</p>
Greater than or equal to Grade 3: Severe	<p>Withhold lorlatinib until symptoms resolve to less than or equal to Grade 2 or baseline. Then resume lorlatinib at 1 reduced dose level.</p>

Abbreviations: CNS=central nervous system; CTCAE=Common Terminology Criteria for Adverse Events; DBP=diastolic blood pressure; ECG=electrocardiogram; HMG CoA=3-hydroxy-3-methylglutaryl coenzyme A; NCI=National Cancer Institute; SBP=systolic blood pressure; ULN=upper limit of normal.

^a Grade categories are based on NCI CTCAE classifications.

^b Lipid-lowering therapy may include: HMG CoA reductase inhibitor, nicotinic acid, fibric acid derivatives, or ethyl esters of omega-3 fatty acids.

Strong cytochrome P-450 (CYP) 3A4/5 inhibitors

Concurrent use of lorlatinib with medicinal products that are strong CYP3A4/5 inhibitors and grapefruit juice products may increase lorlatinib plasma concentrations. An alternative concomitant medicinal product with less potential to inhibit CYP3A4/5 should be considered (see section 4.5). If a strong CYP3A4/5 inhibitor must be co-administered, the starting lorlatinib dose of 100 mg once daily should be reduced to once daily 75 mg dose (see sections 4.5 and 5.2). If concurrent use of the strong CYP3A4/5 inhibitor is discontinued, lorlatinib should be resumed at the dose used prior to the initiation of the strong CYP3A4/5 inhibitor and after a washout period of 3 to 5 half-lives of the strong CYP3A4/5 inhibitor.

Special populations

Elderly (≥ 65 years)

Due to the limited data on this population, no dose recommendation can be made for patients aged 65 years and older (see section 5.2).

Renal impairment

No dose adjustment is needed for patients with normal renal function and mild or moderate renal impairment [absolute estimated glomerular filtration rate (eGFR): ≥ 30 mL/min]. A reduced dose of lorlatinib is recommended in patients with severe renal impairment (absolute eGFR < 30 mL/min), e.g. a once daily starting dose of 75 mg taken orally (see section 5.2). No information is available for patients on renal dialysis.

Hepatic impairment

No dose adjustments are recommended for patients with mild hepatic impairment. No information is available for lorlatinib in patients with moderate or severe hepatic impairment. Therefore, lorlatinib is not recommended in patients with moderate to severe hepatic impairment (see section 5.2).

Paediatric population

The safety and efficacy of lorlatinib in paediatric patients below 18 years have not been established. No data are available.

Method of administration

Lorviqua is for oral use.

Patients should be encouraged to take their dose of lorlatinib at approximately the same time each day with or without food (see section 5.2). The tablets should be swallowed whole (tablets should not be chewed, crushed or split prior to swallowing). No tablet should be ingested if it is broken, cracked, or otherwise not intact.

4.3 Contraindications

Hypersensitivity to lorlatinib or to any of the excipients listed in section 6.1.

Concomitant use of strong CYP3A4/5 inducers (see sections 4.4 and 4.5).

4.4 Special warnings and precautions for use

Hyperlipidaemia

The use of lorlatinib has been associated with increases in serum cholesterol and triglycerides (see section 4.8). Median time of occurrence of severe increase in serum cholesterol and triglycerides is 201 days (range: 29 to 729 days) and 127 days (range: 15 to 1367 days), respectively. Serum cholesterol and triglycerides should be monitored before initiation of lorlatinib; 2, 4 and 8 weeks after initiating lorlatinib; and regularly thereafter. Initiate or increase the dose of lipid-lowering medicinal products, if indicated (see section 4.2).

Central nervous system effects

Central nervous system (CNS) effects have been observed in patients receiving lorlatinib, including psychotic effects and changes in cognitive function, mood, mental status or speech (see section 4.8). Dose modification or discontinuation may be required for those patients who develop CNS effects (see section 4.2).

Atrioventricular block

Lorlatinib was studied in a population of patients that excluded those with second-degree or third-degree AV block (unless paced) or any AV block with PR interval > 220 msec. PR interval prolongation and AV block have been reported in patients receiving lorlatinib (see section 5.2). Monitor electrocardiogram (ECG) prior to initiating lorlatinib and monthly thereafter, particularly in patients with predisposing conditions to the occurrence of clinically significant cardiac events. Dose modification may be required for those patients who develop AV block (see section 4.2).

Left ventricular ejection fraction decrease

Left ventricular ejection fraction (LVEF) decrease has been reported in patients receiving lorlatinib who had baseline and at least one follow-up LVEF assessment. Based on the available clinical study data, it is not possible to determine a causal relationship between effects on changes in cardiac contractility and lorlatinib. In patients with cardiac risk factors and those with conditions that can affect LVEF, cardiac monitoring, including LVEF assessment at baseline and during treatment, should be considered. In patients who develop relevant cardiac signs/symptoms during treatment, cardiac monitoring, including LVEF assessment, should be considered.

Lipase and amylase increase

Elevations of lipase and/or amylase have occurred in patients receiving lorlatinib (see section 4.8). Median time of occurrence of increase in serum lipase and amylase is 169 days (range: 1 to 1755 days) and 158 days (range: 1 to 1932 days), respectively. Risk of pancreatitis should be considered in patients receiving lorlatinib due to concomitant hypertriglyceridemia and/or a potential intrinsic mechanism. Patients should be monitored for lipase and amylase elevations prior to the start of lorlatinib treatment and regularly thereafter as clinically indicated (see section 4.2).

Interstitial lung disease/Pneumonitis

Severe or life-threatening pulmonary adverse reactions consistent with ILD/pneumonitis have occurred with lorlatinib (see section 4.8). Any patient who presents with worsening of respiratory symptoms indicative of ILD/pneumonitis (e.g. dyspnoea, cough and fever) should be promptly evaluated for ILD/pneumonitis. Lorlatinib should be withheld and/or permanently discontinued based on severity (see section 4.2).

Hypertension

Hypertension has been reported in patients receiving lorlatinib (see section 4.8). Blood pressure should be controlled prior to initiation of lorlatinib. Blood pressure should be monitored after 2 weeks and at least monthly thereafter during treatment with lorlatinib. Lorlatinib should be withheld and resumed at a reduced dose or permanently discontinued based on severity (see section 4.2).

Hyperglycaemia

Hyperglycaemia has occurred in patients receiving lorlatinib (see section 4.8). Fasting serum glucose should be assessed prior to initiation of lorlatinib and monitored periodically thereafter according to national guidelines. Lorlatinib should be withheld and resumed at a reduced dose or permanently discontinued based on severity (see section 4.2).

Drug-drug interactions

In a study conducted in healthy volunteers, the concomitant use of lorlatinib and rifampin, a strong CYP3A4/5 inducer, was associated with increases of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) with no increase of total bilirubin and alkaline phosphatase (see section 4.5). Concomitant use of a strong CYP3A4/5 inducer is contraindicated (see sections 4.3 and 4.5). No

clinically meaningful changes in liver function tests were seen in healthy subjects after receiving a combination of lorlatinib with the moderate CYP3A4/5 inducer modafinil (see section 4.5).

Concurrent administration of lorlatinib with CYP3A4/5 substrates with narrow therapeutic indices, including but not limited to alfentanil, ciclosporin, dihydroergotamine, ergotamine, fentanyl, hormonal contraceptives, pimozide, quinidine, sirolimus and tacrolimus, should be avoided since the concentration of these medicinal products may be reduced by lorlatinib (see section 4.5).

Fertility and pregnancy

During treatment with lorlatinib and for at least 14 weeks after the final dose, male patients with female partners of childbearing potential must use effective contraception, including a condom, and male patients with pregnant partners must use condoms (see section 4.6). Male fertility may be compromised during treatment with lorlatinib (see section 5.3). Men should seek advice on effective fertility preservation before treatment. Women of childbearing potential should be advised to avoid becoming pregnant while receiving lorlatinib. A highly effective non-hormonal method of contraception is required for female patients during treatment with lorlatinib, because lorlatinib can render hormonal contraceptives ineffective (see sections 4.5 and 4.6). If a hormonal method of contraception is unavoidable, then a condom must be used in combination with the hormonal method. Effective contraception must be continued for at least 35 days after completing therapy (see section 4.6). It is not known whether lorlatinib affects female fertility.

Lactose intolerance

This medicinal product contains lactose as an excipient. Patients with rare hereditary problems of galactose intolerance, total lactase deficiency, or glucose-galactose malabsorption should not take this medicinal product.

Dietary sodium

This medicinal product contains less than 1 mmol sodium (23 mg) per 25 mg or 100 mg tablet. Patients on low sodium diets should be informed that this product is essentially “sodium-free”.

4.5 Interaction with other medicinal products and other forms of interaction

Pharmacokinetic interactions

In vitro data indicate that lorlatinib is primarily metabolised by CYP3A4 and uridine diphosphate-glucuronosyltransferase (UGT)1A4, with minor contributions from CYP2C8, CYP2C19, CYP3A5 and UGT1A3.

Effect of medicinal products on lorlatinib

CYP3A4/5 inducers

Rifampin, a strong inducer of CYP3A4/5, administered at oral doses of 600 mg once daily for 12 days, reduced the mean lorlatinib area under curve (AUC_{inf}) by 85% and C_{max} by 76% of a single 100 mg oral dose of lorlatinib in healthy volunteers; increases in AST and ALT were also observed.

Concomitant administration of lorlatinib with strong CYP3A4/5 inducers (e.g. rifampicin, carbamazepine, enzalutamide, mitotane, phenytoin and St. John’s wort) may decrease lorlatinib plasma concentrations. The use of a strong CYP3A4/5 inducer with lorlatinib is contraindicated (see sections 4.3 and 4.4). No clinically meaningful changes in liver function test results were seen after administration of the combination of a single 100 mg oral dose of lorlatinib with the moderate CYP3A4/5 inducer, modafinil (400 mg once daily for 19 days) in healthy volunteers. Concomitant use of modafinil did not have a clinically meaningful effect on lorlatinib pharmacokinetics.

CYP3A4/5 inhibitors

Itraconazole, a strong inhibitor of CYP3A4/5, administered at oral doses of 200 mg once daily for 5 days, increased the mean lorlatinib AUC_{inf} by 42% and C_{max} by 24% of a single 100 mg oral dose of lorlatinib in healthy volunteers. Concomitant administration of lorlatinib with strong CYP3A4/5 inhibitors (e.g. boceprevir, cobicistat, itraconazole, ketoconazole, posaconazole, troleandomycin, voriconazole, ritonavir, paritaprevir in combination with ritonavir and ombitasvir and/or dasabuvir, and ritonavir in combination with either elvitegravir, indinavir, lopinavir or tipranavir) may increase lorlatinib plasma concentrations. Grapefruit products may also increase lorlatinib plasma concentrations and should be avoided. An alternative concomitant medicinal product with less potential to inhibit CYP3A4/5 should be considered. If a strong CYP3A4/5 inhibitor must be concomitantly administered, a dose reduction of lorlatinib is recommended (see section 4.2).

Effect of lorlatinib on other medicinal products

CYP3A4/5 substrates

In vitro studies indicated that lorlatinib is a time-dependent inhibitor as well as an inducer of CYP3A4/5. Lorlatinib 150 mg orally once daily for 15 days decreased AUC_{inf} and C_{max} of a single oral 2 mg dose of midazolam (a sensitive CYP3A substrate) by 61% and 50%, respectively; hence, lorlatinib is a moderate CYP3A inducer. Thus, concurrent administration of lorlatinib with CYP3A4/5 substrates with narrow therapeutic indices, including but not limited to alfentanil, ciclosporin, dihydroergotamine, ergotamine, fentanyl, hormonal contraceptives, pimozone, quinidine, sirolimus and tacrolimus, should be avoided since the concentration of these medicinal products may be reduced by lorlatinib (see section 4.4).

CYP2B6 substrates

Lorlatinib 100 mg once daily for 15 days decreased AUC_{inf} and C_{max} of a single oral 100 mg dose of bupropion (a combined CYP2B6 and CYP3A4 substrate) by 49.5% and 53%, respectively. Thus, lorlatinib is a weak inducer of CYP2B6, and no dose adjustment is necessary when lorlatinib is used in combination with medicinal products that are mainly metabolised by CYP2B6.

CYP2C9 substrates

Lorlatinib 100 mg once daily for 15 days decreased AUC_{inf} and C_{max} of a single oral 500 mg dose of tolbutamide (a sensitive CYP2C9 substrate) by 43% and 15%, respectively. Thus, lorlatinib is a weak inducer of CYP2C9, and no dose adjustment is required for medicinal products that are mainly metabolised by CYP2C9. However, patients should be monitored in case of concomitant treatment with medicinal products with narrow therapeutic indices metabolised by CYP2C9 (e.g. coumarin anticoagulants).

UGT substrates

Lorlatinib 100 mg once daily for 15 days decreased AUC_{inf} and C_{max} of a single oral 500 mg dose of acetaminophen (a UGT, SULT and CYP1A2, 2A6, 2D6, and 3A4 substrate) by 45% and 28%, respectively. Thus, lorlatinib is a weak inducer of UGT, and no dose adjustment is required for medicinal products that are mainly metabolised by UGT. However, patients should be monitored in case of concomitant treatment with medicinal products with narrow therapeutic indices metabolised by UGT.

P-glycoprotein substrates

Lorlatinib 100 mg once daily for 15 days decreased AUC_{inf} and C_{max} of a single oral dose of 60 mg fexofenadine [a sensitive P-glycoprotein (P-gp) substrate] by 67% and 63%, respectively. Thus, lorlatinib is a moderate inducer of P-gp. Medicinal products that are P-gp substrates with narrow

therapeutic indices (e.g. digoxin, dabigatran etexilate) should be used with caution in combination with lorlatinib due to the likelihood of reduced plasma concentrations of these substrates.

In vitro inhibition and induction studies of other CYP enzymes

In vitro, lorlatinib has a low potential to cause drug-drug interactions by induction of CYP1A2.

In vitro studies with drug transporters other than P-gp

In vitro studies indicated that lorlatinib may have the potential to inhibit BCRP (gastrointestinal tract), OATP1B1, OATP1B3, OCT1, MATE1 and OAT3 at clinically relevant concentrations. Lorlatinib should be used with caution in combination with substrates of BCRP, OATP1B1, OATP1B3, OCT1, MATE1 and OAT3 as clinically relevant changes in the plasma exposure of these substrates cannot be ruled out.

4.6 Fertility, pregnancy and lactation

Women of childbearing potential/Contraception in males and females

Women of childbearing potential should be advised to avoid becoming pregnant while receiving lorlatinib. A highly effective non-hormonal method of contraception is required for female patients during treatment with lorlatinib, because lorlatinib can render hormonal contraceptives ineffective (see sections 4.4 and 4.5). If a hormonal method of contraception is unavoidable, then a condom must be used in combination with the hormonal method. Effective contraception must be continued for at least 35 days after completing therapy.

During treatment with lorlatinib and for at least 14 weeks after the final dose, male patients with female partners of childbearing potential must use effective contraception, including a condom, and male patients with pregnant partners must use condoms.

Pregnancy

Studies in animals have shown embryo-foetal toxicity (see section 5.3). There are no data from the use of lorlatinib in pregnant women. Lorlatinib may cause foetal harm when administered to a pregnant woman.

Lorlatinib is not recommended during pregnancy or for women of childbearing potential not using contraception.

Breast-feeding

It is unknown whether lorlatinib and its metabolites are excreted in human milk. A risk to the newborns/infants cannot be excluded.

Lorlatinib should not be used during breast-feeding. Breast-feeding should be discontinued during treatment with lorlatinib and for 7 days after the final dose.

Fertility

Based on non-clinical safety findings, male fertility may be compromised during treatment with lorlatinib (see section 5.3). It is not known whether lorlatinib affects female fertility. Men should seek advice on effective fertility preservation before treatment.

4.7 Effects on ability to drive and use machines

Lorlatinib has moderate influence on the ability to drive and use machines. Caution should be exercised when driving or operating machines as patients may experience CNS effects (see section 4.8).

4.8 Undesirable effects

Summary of the safety profile

The most frequently reported adverse reactions were hypercholesterolaemia (79.0%), hypertriglyceridaemia (67.5%), oedema (55.4%), peripheral neuropathy (44.2%), fatigue (30.7%), weight increased (29.8%), arthralgia (27.8%), cognitive effects (27.4%), diarrhoea (22.7%) and mood effects (21.4%).

Serious adverse reactions were reported in 9.1% of patients receiving lorlatinib. The most frequent serious adverse drug reactions were cognitive effects, and pneumonitis.

Dose reductions due to adverse reactions occurred in 20.1% of patients receiving lorlatinib. The most common adverse reactions that led to dose reductions were oedema, cognitive effects and peripheral neuropathy. Permanent treatment discontinuation associated with adverse reactions occurred in 4.0% of patients receiving lorlatinib. The most frequent adverse reactions that led to permanent discontinuations were cognitive effects, peripheral neuropathy, pneumonitis and psychotic effects.

Tabulated list of adverse reactions

Table 2 presents adverse reactions occurring in 547 adult patients treated with lorlatinib 100 mg once daily with advanced NSCLC from Study A (N=327), CROWN study (N=149) and Study B (N=71).

The adverse reactions listed in Table 2 are presented by system organ class and frequency categories, defined using the following convention: very common ($\geq 1/10$), common ($\geq 1/100$ to $< 1/10$), uncommon ($\geq 1/1,000$ to $< 1/100$), rare ($\geq 1/10,000$ to $< 1/1,000$), very rare ($< 1/10,000$). Within each frequency grouping, undesirable effects are presented in order of decreasing medical seriousness.

Table 2. Adverse reactions

System organ class and adverse reaction	Frequency category	All Grades %	Grades 3-4 %
Blood and lymphatic system disorders Anaemia	Very common	19.6	4.4
Metabolism and nutrition disorders Hypercholesterolaemia ^a Hypertriglyceridaemia ^b Hyperglycaemia	Very common Very common Common	79.0 67.5 9.7	19.2 20.3 3.7
Psychiatric disorders Mood effects ^c Psychotic effects ^d Mental status changes	Very common Common Common	21.4 6.9 1.1	1.3 0.9 0.9
Nervous system disorders Cognitive effects ^e Peripheral neuropathy ^f Headache Speech effects ^g	Very common Very common Very common Common	27.4 44.2 18.6 8.2	3.5 2.6 0.7 0.7
Eye disorders Vision disorder ^h	Very common	16.1	0.2
Vascular disorders Hypertension	Very common	14.8	6.0

Respiratory, thoracic and mediastinal disorders			
Pneumonitis ⁱ	Common	2.4	0.7
Gastrointestinal disorders			
Diarrhoea	Very common	22.7	1.8
Nausea	Very common	17.6	0.9
Constipation	Very common	16.8	0.2
Skin and subcutaneous tissue disorders			
Rash ^j	Very common	14.6	0.2
Renal and urinary disorders			
Proteinuria	Common	3.7	0.4
Musculoskeletal and connective tissue disorders			
Arthralgia	Very common	27.8	0.7
Myalgia ^k	Very common	15.0	0
General disorders and administration site conditions			
Oedema ^l	Very common	55.4	2.9
Fatigue ^m	Very common	30.7	1.1
Investigations			
Weight increased	Very common	29.8	11
Lipase increased	Very common	12.8	6.8
Amylase increased	Very common	11.3	2.7
Electrocardiogram PR prolongation	Uncommon	0.7	0

Adverse reactions that represent the same medical concept or condition were grouped together and reported as a single adverse reaction in the table above. Terms actually reported in the studies and contributing to the relevant adverse reaction are indicated in parentheses, as listed below.

- ^a Hypercholesterolaemia (including blood cholesterol increased, hypercholesterolaemia).
- ^b Hypertriglyceridaemia (including blood triglycerides increased, hypertriglyceridaemia).
- ^c Mood effects (including affective disorder, affect lability, aggression, agitation, anger, anxiety, bipolar I disorder, depressed mood, depression, depressive symptom, euphoric mood, irritability, mania, mood altered, mood swings, panic attack, personality change, stress).
- ^d Psychotic effects (including auditory hallucination, hallucination, visual hallucination).
- ^e Cognitive effects (including events from SOC Nervous system disorders: amnesia, cognitive disorder, dementia, disturbance in attention, memory impairment, mental impairment; and also including events from SOC Psychiatric disorders: attention deficit/hyperactivity disorder, confusional state, delirium, disorientation, reading disorder). Within these effects, terms from SOC Nervous system disorders were more frequently reported than terms from SOC Psychiatric disorder.
- ^f Peripheral neuropathy (including burning sensation, dysaesthesia, formication, gait disturbance, hypoaesthesia, motor dysfunction, muscular weakness, neuralgia, neuropathy peripheral, neurotoxicity, paraesthesia, peripheral motor neuropathy, peripheral sensory neuropathy, peroneal nerve palsy, sensory disturbance).
- ^g Speech effects (dysarthria, slow speech, speech disorder).
- ^h Vision disorder (including diplopia, photophobia, photopsia, vision blurred, visual acuity reduced, visual impairment, vitreous floaters).
- ⁱ Pneumonitis (including interstitial lung disease, lung opacity, pneumonitis).
- ^j Rash (including dermatitis acneiform, maculopapular rash, pruritic rash, rash).
- ^k Myalgia (including musculoskeletal pain, myalgia).
- ^l Oedema (including generalised oedema, oedema peripheral, peripheral swelling, swelling).
- ^m Fatigue (including asthenia, fatigue).

Description of selected adverse reactions

Hypercholesterolaemia/hypertriglyceridaemia

Adverse reactions of increase in serum cholesterol or triglycerides were reported in 79.0% and 67.5% of patients, respectively. Of those, mild or moderate adverse reactions of hypercholesterolaemia or hypertriglyceridaemia occurred in 59.8% and 47.2% of patients, respectively (see section 4.4). The median time to onset for hypercholesterolaemia and hypertriglyceridaemia was 15 days (range: 1 to

1921 days) and 16 days (range: 1 to 1921 days), respectively. The median duration of hypercholesterolaemia and hypertriglyceridaemia was 526 and 519 days, respectively.

Central nervous system effects

CNS adverse reactions were primarily cognitive effects (27.4%), mood effects (21.4%), speech effects (8.2%) and psychotic effects (6.9%), and were generally mild, transient, and reversible spontaneously upon dose delay and/or dose reduction (see sections 4.2 and 4.4). The most frequent cognitive effect of any grade was memory impairment (10.8%), and the most frequent Grade 3 or 4 reactions were confusional state and cognitive disorder (1.6% and 0.7%, respectively). The most frequent mood effect of any grade was anxiety (7.3%), and the most frequent Grade 3 and 4 reactions were irritability (0.7%), depression (0.4%), anxiety, agitation and bipolar I disorder (0.2% each). The most frequent speech effect of any grade was dysarthria (3.8%), and the Grade 3 or 4 reactions were dysarthria (0.4%), slow speech and speech disorder (0.2% each). The most frequent psychotic effect of any grade was hallucination (2.7%), and the most frequent Grade 3 or 4 reactions were hallucination auditory, hallucination visual, delusion, acute psychosis and schizophrenic disorder (0.2% each). Median time to onset for cognitive, mood, speech and psychotic effects was 129, 57, 58 and 27 days, respectively. Median duration of cognitive, mood, speech and psychotic effects was 270, 145, 147 and 84 days, respectively.

Hypertension

Adverse reactions of hypertension were reported in 14.8% of patients from Study A, CROWN (B7461006) and Study B (B7461027). Of those, mild or moderate adverse reactions of hypertension occurred in 8.8% of patients (see section 4.4). The median time to onset of hypertension was 295 days (range: 1 to 1990 days). The median duration of hypertension was 505 days.

Hyperglycaemia

Adverse reactions of hyperglycaemia were reported in 9.7% of patients from Study A, CROWN (B7461006) and Study B (B7461027). Of those, mild or moderate adverse reactions of hyperglycaemia occurred in 6.0% of patients (see section 4.4). The median time to onset of hyperglycaemia was 148 days (range: 1 to 1637 days). The median duration of hyperglycaemia was 118 days.

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via [the national reporting system listed in Appendix V](#).

4.9 Overdose

Treatment of overdose with the medicinal product consists of general supportive measures. Given the dose-dependent effect on PR interval, ECG monitoring is recommended. There is no antidote for lorlatinib.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: anti-neoplastic agents, protein kinase inhibitors, ATC code: L01ED05

Mechanism of action

Lorlatinib is a selective, adenosine triphosphate (ATP)-competitive inhibitor of ALK and c-ros oncogene 1 (ROS1) tyrosine kinases.

In non-clinical studies, lorlatinib inhibited catalytic activities of non-mutated ALK and clinically relevant ALK mutant kinases in recombinant enzyme and cell-based assays. Lorlatinib demonstrated marked antitumour activity in mice bearing tumour xenografts that express echinoderm microtubule-associated protein-like 4 (EML4) fusions with ALK variant 1 (v1), including ALK mutations L1196M, G1269A, G1202R, and I1171T. Two of these ALK mutants, G1202R and I1171T, are known to confer resistance to alectinib, brigatinib, ceritinib, and crizotinib. Lorlatinib was also capable of penetrating the blood-brain barrier. Lorlatinib demonstrated activity in mice bearing orthotopic EML4-ALK or EML4-ALK^{L1196M} brain tumour implants.

Clinical efficacy

Previously untreated ALK-positive advanced NSCLC (CROWN Study)

The efficacy of lorlatinib for the treatment of patients with ALK-positive NSCLC who had not received prior systemic therapy for metastatic disease was established in an open-label, randomised, active-controlled, multicentre Study B7461006 (CROWN study). Patients were required to have an Eastern Cooperative Oncology Group (ECOG) performance status of 0-2 and ALK-positive NSCLC as identified by the VENTANA ALK (D5F3) CDx assay. Neurologically stable patients with treated or untreated asymptomatic CNS metastases, including leptomeningeal metastases, were eligible. Patients were required to have finished radiation therapy, including stereotactic or partial brain irradiation within 2 weeks prior to randomisation; whole brain irradiation within 4 weeks prior to randomisation.

Patients were randomised 1:1 to receive lorlatinib 100 mg orally once daily or crizotinib 250 mg orally twice daily. Randomisation was stratified by ethnic origin (Asian vs. non-Asian) and the presence or absence of CNS metastases at baseline. Treatment on both arms was continued until disease progression or unacceptable toxicity. The major efficacy outcome measure was progression-free survival (PFS) as determined by Blinded Independent Central Review (BICR) according to Response Evaluation Criteria in Solid Tumours (RECIST) version 1.1 (v1.1). Additional efficacy outcome measures were overall survival (OS), PFS by investigator assessment, PFS2 and tumour assessment related data by BICR, including objective response rate (ORR), duration of response (DOR) and time to intracranial progression (IC-TTP). In patients with CNS metastases at baseline, additional outcome measures were intracranial objective response rate (IC-ORR) and intracranial duration of response (IC-DOR) all by BICR.

A total of 296 patients were randomised to lorlatinib (n=149) or crizotinib (n=147). The demographic characteristics of the overall study population were: median age 59 years (range: 26 to 90 years), age ≥ 65 years (35%), 59% female, 49% White, 44% Asian and 0.3% Black. The majority of patients had adenocarcinoma (95%) and never smoked (59%). Central nervous system metastases as determined by BICR neuroradiologists were present in 26% (n=78) of patients: of these, 30 patients had measurable CNS lesions.

Results from the CROWN study are summarised in Table 3. At the data cutoff point, OS and PFS2 data were not mature.

Table 3. Overall efficacy results in CROWN study

Efficacy parameter	Lorlatinib N=149	Crizotinib N=147
Median duration of follow-up, months (95% CI)^a	18 (16, 20)	15 (13, 18)
Progression-free survival by BICR		
Number of patients with event, n (%)	41 (28%)	86 (59%)
Progressive disease, n (%)	32 (22%)	82 (56%)
Death, n (%)	9 (6%)	4 (3%)
Median, months (95% CI) ^a	NE (NE, NE)	9 (8, 11)

Efficacy parameter	Lorlatinib N=149	Crizotinib N=147
Hazard ratio (95% CI) ^b	0.28 (0.19, 0.41)	
p-value [*]	< 0.0001	
Overall survival		
Number of patients with event, n (%)	23 (15%)	28 (19%)
Median, months (95% CI) ^a	NE (NE, NE)	NE (NE, NE)
Hazard ratio (95% CI) ^b	0.72 (0.41, 1.25)	
Progression-free survival by INV		
Number of patients with event, n (%)	40 (27%)	104 (71%)
Progressive disease, n (%)	34 (23%)	99 (67%)
Death, n (%)	6 (4%)	5 (3%)
Median, months (95% CI) ^a	NE (NE, NE)	9 (7, 11)
Hazard ratio (95% CI) ^b	0.21 (0.14, 0.31)	
p-value [*]	< 0.0001	
Overall response by BICR		
Overall response rate, n (%)	113 (76%)	85 (58%)
(95% CI) ^c	(68, 83)	(49, 66)
Time to intracranial progression		
Median, months (95% CI) ^a	NE (NE, NE)	16.6 (11, NE)
Hazard ratio (95% CI) ^b	0.07 (0.03, 0.17)	
Duration of response		
Number of responders	113	85
Median, months (95% CI) ^a	NE (NE, NE)	11 (9, 13)
Intracranial overall response in patients with measurable CNS lesions at baseline		
	N=17	N=13
Intracranial response rate, n (%)	14 (82%)	3 (23%)
(95% CI) ^c	(57, 96)	(5, 54)
Complete response rate	71%	8%
Duration of response		
Number of responders	14	3
Median, months (95% CI) ^a	NE (NE, NE)	10 (9, 11)
Intracranial overall response in patients with any measurable or nonmeasurable CNS lesions at baseline		
	N=38	N=40
Intracranial response rate, n (%)	25 (66%)	8 (20%)
(95% CI) ^c	(49, 80)	(9, 36)
Complete response rate	61%	15%
Duration of response		
Number of responders	25	8
Median, months (95% CI) ^a	NE (NE, NE)	9 (6, 11)

Abbreviations: BICR=blinded independent central review; CI=confidence interval; CNS=central nervous system; INV=investigator assessment; N/n=number of patients; NE=not estimable.

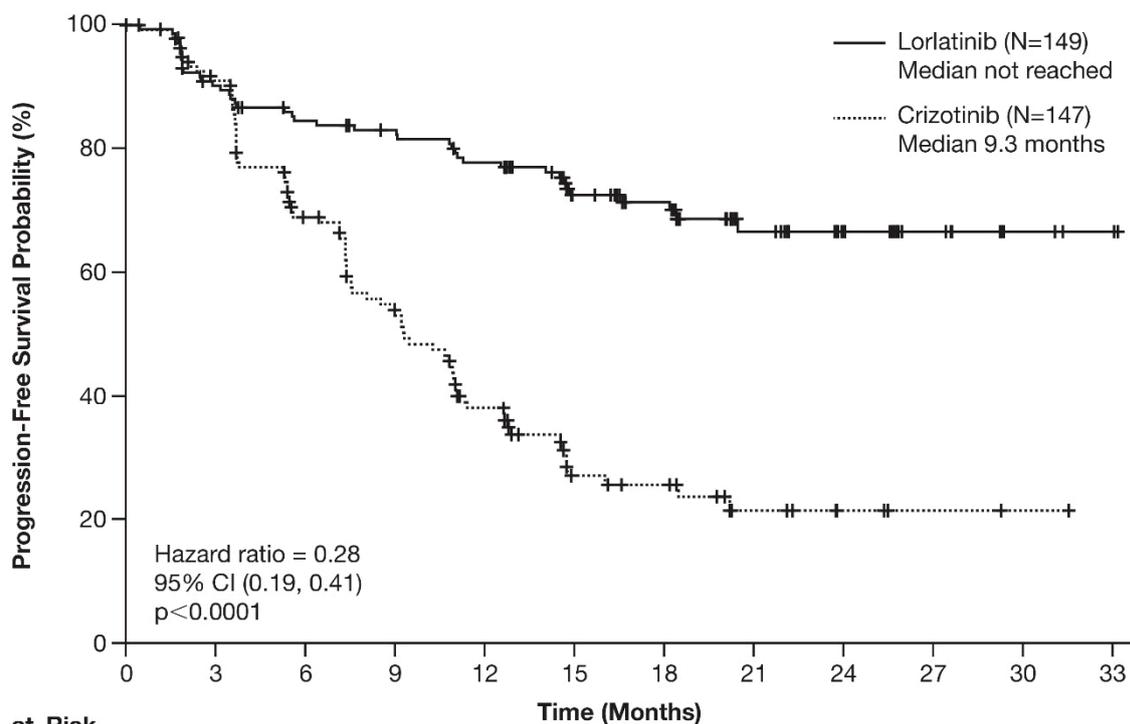
* p-value based on 1-sided stratified log-rank test.

^a Based on the Brookmeyer and Crowley method.

^b Hazard ratio based on Cox proportional hazards model; under proportional hazards, hazard ratio < 1 indicates a reduction in hazard rate in favour of lorlatinib.

^c Using exact method based on binomial distribution.

Figure 1. Kaplan-Meier plot of progression-free survival by blinded independent central review in CROWN study



No. at Risk

Lorlatinib	149	129	118	113	105	73	59	33	20	11	4	2
Crizotinib	147	120	84	62	39	19	16	8	4	2	1	0

Abbreviations: CI=confidence interval; N/No.=number of patients.

The benefit from lorlatinib treatment was comparable across subgroups of baseline patient and disease characteristics, including patients with CNS metastases at baseline (n=38, HR=0.2, 95% CI: 0.10-0.43) and patients without CNS metastases at baseline (n=111, HR=0.32, 95% CI: 0.20-0.49).

ALK-positive advanced NSCLC previously treated with an ALK kinase inhibitor

The use of lorlatinib in the treatment of ALK-positive advanced NSCLC after treatment with at least one second-generation ALK TKI was investigated in Study A, a single-arm, multicentre Phase 1/2 study and in Study B, a single-arm, multicentre Phase 4 study. In Study A, a total of 139 patients with ALK-positive advanced NSCLC after treatment with at least one second-generation ALK TKI were enrolled in the Phase 2 portion of the study. In Study B, a total of 71 patients with ALK-positive advanced NSCLC after one prior ALK TKI treatment (alectinib or ceritinib) were enrolled. In both studies, patients received lorlatinib orally at the recommended dose of 100 mg once daily, continuously.

In Study A, the primary efficacy endpoint in the Phase 2 portion of the study was ORR, including intracranial (IC)-ORR, as per Independent Central Review (ICR) according to modified RECIST v1.1. Secondary endpoints included DOR, IC-DOR, time-to-tumour response (TTR) and PFS. In Study B, the primary efficacy endpoint was ORR, as per ICR according to RECIST v1.1. Secondary endpoints included IC-ORR, DOR, IC-DOR, time-to-tumour response (TTR), time-to-tumour progression (TTP) and PFS.

Patient demographics of the 139 ALK-positive advanced NSCLC patients after treatment with at least one second-generation ALK TKI in Study A were 56% female, 48% White, 38% Asian, and the median age was 53 years (range: 29-83 years) with 16% of patients ≥ 65 years of age. The ECOG performance status at baseline was 0 or 1 in 96% patients. Brain metastases were present at baseline in

67% of patients. Of the 139 patients, 20% received 1 prior ALK TKI, excluding crizotinib, 47% received 2 prior ALK TKIs and 33% received 3 or more prior ALK TKIs.

Patient demographics of the 71 ALK-positive advanced NSCLC patients who progressed after treatment with one prior ALK TKI (alectinib or ceritinib) with or without chemotherapy in Study B were 42% female, 76% White, 21% Asian, and the median age was 59 years (range: 26-87 years) with 32% of patients \geq 65 years of age. The ECOG performance status at baseline was 0 in 52% or 1 in 48% of patients. Brain metastases were present at baseline in 42% of patients. Of the 71 patients, 84% received alectinib and 16% received ceritinib as their prior ALK TKIs.

The main efficacy results for Study A and Study B are included in Tables 4 and 5.

Table 4. Overall efficacy results in Study A and Study B by prior treatment

Efficacy parameter	One prior ALK TKI^a with or without prior chemotherapy (N = 99)^b	Two or more prior ALK TKIs with or without prior chemotherapy (N = 111)^c
Objective response rate ^d (95% CI)	42.4% (32.5, 52.8)	39.6% (30.5, 49.4)
Complete response, n	5	2
Partial response, n	37	42
Duration of response Median, months (95% CI)	NE (7.8, NE)	9.9 (5.7, 24.4)
Progression-free survival Median, months (95% CI)	8.3 (6.3, 16.5)	6.9 (5.4, 9.5)

Abbreviations: ALK=anaplastic lymphoma kinase; CI=confidence interval; ICR=Independent Central Review; N/n=number of patients; NE=not estimable; TKI=tyrosine kinase inhibitor.

^a Alectinib, brigatinib, or ceritinib.

^b Pooled efficacy results from Study A and B

^c Efficacy results from Study A only

^d Per ICR.

Table 5. Intracranial* efficacy results in Study A and Study B by prior treatment

Efficacy parameter	One prior ALK TKI^a with or without prior chemotherapy (N = 19)^b	Two or more prior ALK TKIs with or without prior chemotherapy (N = 48)^c
Objective response rate ^d (95% CI)	63.2% (38.4, 83.7)	52.1% (37.2, 66.7)
Complete response, n	4	10
Partial response, n	8	15
Duration of intra-cranial response Median, months (95% CI)	NE (4.2, NE)	12.4 (6.0, NE)

Abbreviations: ALK=anaplastic lymphoma kinase; CI=confidence interval; ICR=Independent Central Review; N/n=number of patients; NE=not estimable; TKI= tyrosine kinase inhibitor.

* In patients with at least one measurable brain metastasis at baseline.

^a Alectinib, brigatinib, or ceritinib.

^b Pooled efficacy results from Study A and B

^c Efficacy results from Study A only

^d Per ICR.

In the overall efficacy population of 210 patients, 86 patients had a confirmed objective response by ICR with a median TTR of 1.4 months (range: 1.2 to 16.6 months). The ORR for Asians was 48.5%

(95% CI: 36.2, 61.0) and 35.7% for non-Asians (95% CI: 27.4, 44.6). Among the 37 patients with a confirmed IC objective tumour response and at least one measurable brain metastasis at baseline by ICR, the median IC-TTR was 1.4 months (range: 1.2 to 16.2 months). The IC-ORR was 58.3% for Asians (95% CI: 36.6, 77.9) and 47.2% for non-Asians (95% CI: 30.4, 64.5).

Paediatric population

The European Medicines Agency has waived the obligation to submit the results of studies with lorlatinib in all subsets of the paediatric population in lung carcinoma (small cell and non-small cell carcinoma) (see section 4.2 for information on paediatric use).

5.2 Pharmacokinetic properties

Absorption

Peak lorlatinib concentrations in plasma are rapidly reached with the median T_{max} of 1.2 hours following a single 100 mg dose and 2.0 hours following multiple dosing of 100 mg once daily.

After oral administration of lorlatinib tablets, the mean absolute bioavailability is 80.8% (90% CI: 75.7, 86.2) compared to intravenous administration.

Administration of lorlatinib with a high fat, high calorie meal resulted in 5% higher exposure compared to fasted conditions. Lorlatinib may be administered with or without food.

At 100 mg once daily, the geometric mean (% coefficient of variation [CV]) peak plasma concentration was 577 (42) ng/mL and the AUC_{24} was 5,650 (39) ng h/mL in patients with cancer. The geometric mean (% CV) oral clearance was 17.7 (39) L/h.

Distribution

In vitro binding of lorlatinib to human plasma proteins is 66% with moderate binding to albumin or to α_1 -acid glycoprotein.

Biotransformation

In humans, lorlatinib undergoes oxidation and glucuronidation as the primary metabolic pathways. *In vitro* data indicate that lorlatinib is metabolised primarily by CYP3A4 and UGT1A4, with minor contribution from CYP2C8, CYP2C19, CYP3A5 and UGT1A3.

In plasma, a benzoic acid metabolite of lorlatinib resulting from the oxidative cleavage of the amide and aromatic ether bonds of lorlatinib was observed as a major metabolite, accounting for 21% of the circulating radioactivity. The oxidative cleavage metabolite is pharmacologically inactive.

Elimination

The plasma half-life of lorlatinib after a single 100 mg dose was 23.6 hours. The estimated lorlatinib effective plasma half-life at steady-state following completion of autoinduction was 14.83 hours. Following oral administration of a 100 mg radiolabelled dose of lorlatinib, a mean 47.7% of the radioactivity was recovered in urine and 40.9% of the radioactivity was recovered in faeces, with overall mean total recovery of 88.6%.

Unchanged lorlatinib was the major component of human plasma and faeces, accounting for 44% and 9.1% of total radioactivity, respectively. Less than 1% of unchanged lorlatinib was detected in urine.

Furthermore, lorlatinib is an inducer via human pregnane-X-receptor (PXR) and the human constitutive androstane receptor (CAR).

Linearity/non-linearity

At single dose, lorlatinib systemic exposure (AUC_{inf} and C_{max}) increased in a dose-related manner over the 10 to 200 mg dose range. Few data are available over the 10 to 200 mg dose range; however, no deviation from linearity was observed for AUC_{inf} and C_{max} after single dose.

After multiple once daily dose administration, lorlatinib C_{max} increased dose-proportionally and AUC_{tau} increased slightly less than proportionally over the dose range of 10 to 200 mg once daily.

Also, at steady-state lorlatinib plasma exposures are lower than those expected from single dose pharmacokinetics, indicative of a net time-dependent auto-induction effect.

Hepatic impairment

As lorlatinib is metabolised in the liver, hepatic impairment is likely to increase lorlatinib plasma concentrations. Clinical studies that were conducted excluded patients with AST or ALT $> 2.5 \times$ ULN, or if due to underlying malignancy, $> 5.0 \times$ ULN or with total bilirubin $> 1.5 \times$ ULN. Population pharmacokinetic analyses have shown that lorlatinib exposure was not clinically meaningfully altered in patients with mild hepatic impairment ($n = 50$). No dose adjustments are recommended for patients with mild hepatic impairment. No information is available for patients with moderate or severe hepatic impairment.

Renal impairment

Less than 1% of the administered dose is detected as unchanged lorlatinib in urine. Population pharmacokinetic analyses have shown that lorlatinib steady-state plasma exposure and C_{max} values slightly increase with worsening baseline renal function. Based on a renal impairment study, no starting dose adjustments are recommended for patients with mild or moderate renal impairment [eGFR based on Modification of Diet in Renal Disease Study equation (MDRD)-derived eGFR (in mL/min/1.73 m²) \times measured body surface area/1.73 ≥ 30 mL/min]. In this study, lorlatinib AUC_{inf} increased by 41% in subjects with severe renal impairment (absolute eGFR < 30 mL/min) compared to subjects with normal renal function (absolute eGFR ≥ 90 mL/min). A reduced dose of lorlatinib is recommended in patients with severe renal impairment, e.g., a once daily oral starting dose of 75 mg (see section 4.2). No information is available for patients on renal dialysis.

Age, gender, race, body weight and phenotype

Population pharmacokinetic analyses in patients with advanced NSCLC and healthy volunteers indicate that there are no clinically relevant effects of age, gender, race, body weight and phenotypes for CYP3A5 and CYP2C19.

Cardiac electrophysiology

In Study A, 2 patients (0.7%) had absolute Fridericia's correction QTc (QTcF) values > 500 msec and 5 patients (1.8%) had a change in QTcF from baseline > 60 msec.

In addition, the effect of a single oral dose of lorlatinib (50 mg, 75 mg, and 100 mg) with and without 200 mg once daily itraconazole was evaluated in a 2-way crossover study in 16 healthy volunteers. No increases in the mean QTc were observed at the mean observed lorlatinib concentrations in this study.

In 295 patients who received lorlatinib at the recommended dose of 100 mg once daily and had a ECG measurement in Study A, lorlatinib was studied in a population of patients that excluded those with QTc interval > 470 msec. In the study population, the maximum mean change from baseline for PR interval was 16.4 msec (2-sided 90% upper CI 19.4 msec) (see sections 4.2, 4.4 and 4.8). Of these, 7 patients had a baseline PR > 200 msec. Among the 284 patients with PR interval < 200 msec, 14% had PR interval prolongation ≥ 200 msec after starting lorlatinib. The prolongation of PR interval occurred in a concentration-dependent manner. Atrioventricular block occurred in 1.0% of patients.

For those patients who develop PR prolongation, dose modification may be required (see section 4.2).

5.3 Preclinical safety data

Repeat-dose toxicity

The main toxicities observed were inflammation across multiple tissues (skin and cervix of rats and lung, trachea, skin, lymph nodes and/or the oral cavity including mandibular bone of dogs; associated with increases in white blood cells, fibrinogen and/or globulin and decreases in albumin) and changes in the pancreas (with increases in amylase and lipase), hepatobiliary system (with increases in liver enzymes), male reproductive system, cardiovascular system, kidneys and gastrointestinal tract, peripheral nerves and the CNS (potential for cognitive functional impairment) at dose equivalent to human clinical exposure at the recommended posology. Changes in blood pressure and heart rate, and QRS complex and PR interval were also observed in animals after acute dosing (approximately 2.6 times the human clinical exposure at 100 mg after a single dose based on C_{max}). All target organ findings with the exception of hepatic bile duct hyperplasia were partially to fully reversible.

Genotoxicity

Lorlatinib is not mutagenic but is aneugenic *in vitro* and *in vivo* with a no observed effect level for aneugenicity approximately 16.5 times human clinical exposure at 100 mg based on AUC.

Carcinogenicity

Carcinogenicity studies have not been conducted with lorlatinib.

Reproductive toxicity

Seminiferous tubular degeneration and/or atrophy in the testes, and epididymal changes (inflammation and/or vacuolation) were observed in the rat and dog. In the prostate, minimal to mild glandular atrophy was observed in dogs at dose equivalent to human clinical exposure at the recommended posology). The effects on male reproductive organs were partially to fully reversible.

In embryo-foetal toxicity studies, conducted in rats and rabbits, respectively, increased embryoletality and lower foetal body weights and malformations were observed. Foetal morphologic abnormalities included rotated limbs, supernumerary digits, gastroschisis, malformed kidneys, domed head, high arched palate and dilation of ventricles of the brain. The exposure at the lowest doses with embryo-foetal effects in animals was equivalent to the human clinical exposure at 100 mg, based on AUC.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Tablet core

Microcrystalline cellulose
Calcium hydrogen phosphate
Sodium starch glycolate
Magnesium stearate

Film-coating

Hypromellose
Lactose monohydrate
Macrogol
Triacetin
Titanium dioxide (E171)
Iron oxide black (E172)
Iron oxide red (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 contents of container

OPA/Al/PVC blisters with aluminium foil backing containing 10 film-coated tablets.

Lorviqua 25 mg film-coated tablets

Each pack contains 90 film-coated tablets in 9 blisters.

Lorviqua 100 mg film-coated tablets

Each pack contains 30 film-coated tablets in 3 blisters.

Not all pack sizes may be marketed.

6.6 Special precautions for disposal

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

7. MARKETING AUTHORISATION HOLDER

Pfizer Europe MA EEIG
Boulevard de la Plaine 17
1050 Bruxelles
Belgium

8. MARKETING AUTHORISATION NUMBER(S)

EU/1/19/1355/002

EU/1/19/1355/003

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

Date of first authorisation: 6 May 2019

Date of latest renewal: 5 April 2024

10. DATE OF REVISION OF THE TEXT

Detailed information on this medicinal product is available on the website of the European Medicines Agency <https://www.ema.europa.eu>.

ANNEX II

- A. MANUFACTURER(S) RESPONSIBLE FOR BATCH RELEASE**
- B. CONDITIONS OR RESTRICTIONS REGARDING SUPPLY AND USE**
- C. OTHER CONDITIONS AND REQUIREMENTS OF THE MARKETING AUTHORISATION**
- D. CONDITIONS OR RESTRICTIONS WITH REGARD TO THE SAFE AND EFFECTIVE USE OF THE MEDICINAL PRODUCT**

A. MANUFACTURER(S) RESPONSIBLE FOR BATCH RELEASE

Name and address of the manufacturer responsible for batch release

Pfizer Manufacturing Deutschland GmbH
Mooswaldallee 1
79108 Freiburg Im Breisgau
Germany

B. CONDITIONS OR RESTRICTIONS REGARDING SUPPLY AND USE

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

C. OTHER CONDITIONS AND REQUIREMENTS OF THE MARKETING AUTHORISATION

- **Periodic safety update reports (PSURs)**

The requirements for submission of PSURs for this medicinal product are set out in Article 9 of Regulation (EC) No 507/2006 and, accordingly, the marketing authorisation holder (MAH) shall submit PSURs every 6 months.

The requirements for submission of PSURs for this medicinal product are set out in the list of Union reference dates (EURD list) provided for under Article 107c(7) of Directive 2001/83/EC and any subsequent updates published on the European medicines web-portal.

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

- **Risk management plan (RMP)**

The MAH shall perform the required pharmacovigilance activities and interventions detailed in the agreed RMP presented in Module 1.8.2 of the marketing authorisation and any agreed subsequent updates of the RMP.

An updated RMP should be submitted:

- At the request of the European Medicines Agency;
- Whenever the risk management system is modified, especially as the result of new information being received that may lead to a significant change to the benefit/risk profile or as the result of an important (pharmacovigilance or risk minimisation) milestone being reached.

- **Obligation to complete post-authorisation measures**

The MAH shall complete, within the stated timeframe, the below measures:

Description	Due date
Post-authorisation efficacy study (PAES): In order to further characterise the efficacy of lorlatinib in patients with ALK-positive advanced NSCLC previously not treated with an ALK inhibitor, the MAH will submit the results including overall survival (OS) data of the Phase III CROWN study (B7461006) comparing lorlatinib versus crizotinib in that same setting. The clinical study report will be submitted by:	01 Dec 2027

ANNEX III
LABELLING AND PACKAGE LEAFLET

A. LABELLING

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

CARTON

1. NAME OF THE MEDICINAL PRODUCT

Lorviqua 25 mg film-coated tablets
lorlatinib

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 25 mg of lorlatinib.

3. LIST OF EXCIPIENTS

Contains lactose (see leaflet for further information).

4. PHARMACEUTICAL FORM AND CONTENTS

90 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.
Oral use.

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

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

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

Pfizer Europe MA EEIG
Boulevard de la Plaine 17
1050 Bruxelles
Belgium

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/19/1355/003 90 film-coated tablets

13. BATCH NUMBER

Lot

14. GENERAL CLASSIFICATION FOR SUPPLY

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Lorviqua 25 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

2D barcode carrying the unique identifier included.

18. UNIQUE IDENTIFIER - HUMAN READABLE DATA

PC
SN
NN

MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

BLISTER

1. NAME OF THE MEDICINAL PRODUCT

Lorviqua 25 mg tablets
lorlatinib

2. NAME OF THE MARKETING AUTHORISATION HOLDER

Pfizer (as MAH logo)

3. EXPIRY DATE

EXP

4. BATCH NUMBER

Lot

5. OTHER

PARTICULARS TO APPEAR ON THE OUTER PACKAGING

CARTON

1. NAME OF THE MEDICINAL PRODUCT

Lorviqua 100 mg film-coated tablets
lorlatinib

2. STATEMENT OF ACTIVE SUBSTANCE(S)

Each film-coated tablet contains 100 mg of lorlatinib.

3. LIST OF EXCIPIENTS

Contains lactose (see leaflet for further information).

4. PHARMACEUTICAL FORM AND CONTENTS

30 film-coated tablets

5. METHOD AND ROUTE(S) OF ADMINISTRATION

Read the package leaflet before use.
Oral use.

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

Keep out of the sight and reach of children.

7. OTHER SPECIAL WARNING(S), IF NECESSARY

8. EXPIRY DATE

EXP

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

Pfizer Europe MA EEIG
Boulevard de la Plaine 17
1050 Bruxelles
Belgium

12. MARKETING AUTHORISATION NUMBER(S)

EU/1/19/1355/002

13. BATCH NUMBER

Lot

14. GENERAL CLASSIFICATION FOR SUPPLY

15. INSTRUCTIONS ON USE

16. INFORMATION IN BRAILLE

Lorviqua 100 mg

17. UNIQUE IDENTIFIER – 2D BARCODE

2D barcode carrying the unique identifier included.

18. UNIQUE IDENTIFIER - HUMAN READABLE DATA

PC
SN
NN

MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS

BLISTER

1. NAME OF THE MEDICINAL PRODUCT

Lorviqua 100 mg tablets
lorlatinib

2. NAME OF THE MARKETING AUTHORISATION HOLDER

Pfizer (as MAH logo)

3. EXPIRY DATE

EXP

4. BATCH NUMBER

Lot

5. OTHER

B. PACKAGE LEAFLET

Package leaflet: Information for the user

Lorviqua 25 mg film-coated tablets Lorviqua 100 mg film-coated tablets lorlatinib

Read all of this leaflet carefully before you start taking this medicine because it contains important information for you.

- Keep this leaflet. You may need to read it again.
- If you have any further questions, ask your doctor, pharmacist or nurse.
- This medicine has been prescribed for you only. Do not pass it on to others. It may harm them, even if their signs of illness are the same as yours.
- If you get any side effects, talk to your doctor, pharmacist or nurse. This includes any possible side effects not listed in this leaflet. See section 4.

What is in this leaflet

1. What Lorviqua is and what it is used for
2. What you need to know before you take Lorviqua
3. How to take Lorviqua
4. Possible side effects
5. How to store Lorviqua
6. Contents of the pack and other information

1. What Lorviqua is and what it is used for

What Lorviqua is

Lorviqua contains the active substance lorlatinib, a medicine that is used for treatment of adults with advanced stages of a form of lung cancer called non-small cell lung cancer (NSCLC). Lorviqua belongs to the group of medicines that inhibit an enzyme called anaplastic lymphoma kinase (ALK). Lorviqua is only given to patients who have an alteration in the ALK gene, see **How Lorviqua works** below.

What Lorviqua is used for

Lorviqua is used to treat adults with a type of lung cancer called non-small cell lung cancer (NSCLC). It is used if your lung cancer:

- is ALK-positive – this means your cancer cells have a fault in a gene that makes an enzyme called ALK (anaplastic lymphoma kinase), see **How Lorviqua works**, below; and
- is advanced.

Lorviqua can be prescribed to you if:

- you have not been previously treated with an ALK inhibitor; or
- you have been previously treated with a medicine called alectinib or ceritinib, which are ALK inhibitors; or
- you have been previously treated with crizotinib followed by another ALK inhibitor.

How Lorviqua works

Lorviqua inhibits a type of enzyme called tyrosine kinase and triggers the death of cancer cells in patients with alterations in genes for ALK. Lorviqua is only given to patients whose disease is due to an alteration in the gene for ALK tyrosine kinase.

If you have any questions about how Lorviqua works or why this medicine has been prescribed for you, ask your doctor.

2. What you need to know before you take Lorviqua

Do not take Lorviqua

- if you are allergic to lorlatinib or any of the other ingredients of this medicine (listed in section 6).
- if you are taking any of these medicines:
 - rifampicin (used to treat tuberculosis)
 - carbamazepine, phenytoin (used to treat epilepsy)
 - enzalutamide (used to treat prostate cancer)
 - mitotane (used to treat cancer of the adrenal glands)
 - medicines containing St. John's wort (*Hypericum perforatum*, a herbal preparation)

Warnings and precautions

Talk to your doctor before taking Lorviqua:

- if you have high levels of blood cholesterol or triglycerides
- if you have high levels of the enzymes known as amylase or lipase in the blood or a condition such as pancreatitis that can raise the levels of these enzymes
- if you have problems with your heart, including heart failure, slow heart rate, or if electrocardiogram (ECG) results show that you have an abnormality of the electrical activity of your heart known as prolonged PR interval or AV block.
- if you have cough, chest pain, shortness of breath, or worsening of respiratory symptoms or have ever had a lung condition called pneumonitis.
- if you have high blood pressure.
- if you have high blood sugar.

If you are not sure, talk to your doctor, pharmacist or nurse before taking Lorviqua.

Tell your doctor immediately if you develop:

- heart problems. Tell your doctor right away about changes in your heart beat (fast or slow), light-headedness, fainting, dizziness or shortness of breath. These symptoms could be signs of heart problems. Your doctor may check for problems with your heart during treatment with Lorviqua. If the results are abnormal, your doctor may decide to reduce the dose of Lorviqua or stop your treatment.
- speech problems, difficulty speaking, including slurred or slow speech. Your doctor may investigate further and may decide to reduce your dose of Lorviqua or stop your treatment.
- mental status changes, mood or memory problems, such as change in your mood (including depression, euphoria and mood swings), irritability, aggression, agitation, anxiety or a change in your personality and episodes of confusion or loss of contact with reality, such as believing, seeing or hearing things that are not real. Your doctor may investigate further and may decide to reduce your dose of Lorviqua or stop your treatment.
- pain in the back or abdomen (belly), yellowing of the skin and eyes (jaundice), nausea or vomiting. These symptoms could be signs of pancreatitis. Your doctor may investigate further and may decide to reduce the dose of Lorviqua.
- cough, chest pain, or a worsening of existing respiratory symptoms. Your doctor may investigate further and treat you with other medicines such as antibiotics and steroids. Your doctor may decide to reduce your dose of Lorviqua or stop your treatment.
- headaches, dizziness, blurred vision, chest pain or shortness of breath. These symptoms could be signs of high blood pressure. Your doctor may investigate further and treat you with medicines to control your blood pressure. Your doctor may decide to reduce your dose of Lorviqua or stop your treatment.
- feeling very thirsty, a need to urinate more than usual, feeling very hungry, feeling sick to your stomach, weakness or tiredness, or confusion. These symptoms could be signs of high blood sugar. Your doctor may investigate further and treat you with medicines to control your blood sugar. Your doctor may decide to reduce your dose of Lorviqua or stop your treatment.

Your doctor may do further assessments and may decide to reduce the dose of Lorviqua or stop your treatment if you:

- develop liver problems. Tell your doctor right away if you feel more tired than usual, your skin and whites of your eyes turn yellow, your urine turns dark or brown (tea colour), you have nausea, vomiting, or decreased appetite, you have pain on the right side of your stomach, you have itching, or if you bruise more easily than usual. Your doctor may do blood tests to check your liver function.
- have kidney problems.

See **Possible side effects** in section 4 for more information.

Children and adolescents

This medicine is only indicated in adults, and it is not to be given to children and adolescents.

Tests and checks

You will have blood tests before you start treatment and during your treatment. These tests are to check the level of cholesterol, triglycerides and the enzymes amylase or lipase in your blood before you start treatment with Lorviqua and regularly during treatment.

Other medicines and Lorviqua

Tell your doctor, pharmacist or nurse if you are taking, have recently taken or might take any other medicines, including herbal medicines and medicines obtained over the counter. This is because Lorviqua can affect the way some other medicines work. Also some medicines can affect the way Lorviqua works.

You must not take Lorviqua with certain medicines. These are listed under **Do not take Lorviqua**, at the start of section 2.

In particular tell your doctor, pharmacist or nurse if you are taking any of the following medicines:

- boceprevir – a medicine used to treat hepatitis C.
- bupropion – a medicine used to treat depression or to help people quit smoking.
- dihydroergotamine, ergotamine – medicines used to treat migraine headaches.
- efavirenz, cobicistat, ritonavir, paritaprevir in combination with ritonavir and ombitasvir and/or dasabuvir, and ritonavir in combination with either elvitegravir, indinavir, lopinavir or tipranavir – medicines used to treat AIDS/HIV.
- ketoconazole, itraconazole, voriconazole, posaconazole – medicines used to treat fungal infections. Also troleandomycin, a medicine used to treat certain types of bacterial infections.
- quinidine – a medicine used to treat irregular heartbeat and other heart problems.
- pimozide – a medicine used to treat mental health problems.
- alfentanil and fentanyl – medicines used to treat severe pain.
- ciclosporin, sirolimus, and tacrolimus – medicines used in organ transplantation to prevent organ rejection.

Lorviqua with food and drink

You must not drink grapefruit juice or eat grapefruit while on treatment with Lorviqua as they may change the amount of Lorviqua in your body.

Pregnancy, breast-feeding and fertility

- Contraception – information for women

You should not become pregnant while taking this medicine. If you are able to have children, you must use highly effective contraception (for example, double-barrier contraception such as condom and diaphragm) while on treatment and for at least 5 weeks after stopping treatment. Lorlatinib may reduce the effectiveness of hormonal contraceptive methods (for example, birth control pill); therefore, hormonal contraceptives may not be considered highly effective. If hormonal contraception is unavoidable it must be used in combination with a condom. Talk to your doctor about the right methods of contraception for you and your partner.

- **Contraception – information for men**

You should not father children during treatment with Lorviqua because this medicine could harm the baby. If there is any possibility that you may father a child while taking this medicine, you must use a condom during treatment, and for at least 14 weeks after completing therapy. Talk to your doctor about the right methods of contraception for you and your partner.

- **Pregnancy**

- Do not take Lorviqua if you are pregnant. This is because it may harm your baby.
- If your male partner is being treated with Lorviqua, he must use a condom during treatment and for at least 14 weeks after completing therapy.
- If you become pregnant when taking the medicine or during the 5 weeks after taking your last dose, tell your doctor straight away.

- **Breast-feeding**

Do not breast-feed while taking this medicine and for 7 days after the last dose. This is because it is not known if Lorviqua can pass into breast milk and could therefore harm your baby.

- **Fertility**

Lorviqua may affect male fertility. Talk to your doctor about fertility preservation before taking Lorviqua.

Driving and using machines

You should take special care when driving and using machines when taking Lorviqua because of its effects on your mental state.

Lorviqua contains lactose

If you have been told by your doctor that you have an intolerance to some sugars, contact your doctor before taking this medicine.

Lorviqua contains sodium

This medicine contains less than 1 mmol sodium (23 mg) per 25 mg or 100 mg tablet, that is to say essentially 'sodium-free'.

3. How to take Lorviqua

Always take this medicine exactly as your doctor, pharmacist or nurse has told you. Check with your doctor, pharmacist or nurse if you are not sure.

- The recommended dose is one tablet of 100 mg taken by mouth once daily.
- Take the dose at about the same time each day.
- You can take the tablets with food or between meals always avoiding grapefruit and grapefruit juice.
- Swallow the tablets whole and do not crush, chew or dissolve the tablets.
- Sometimes your doctor may lower your dose, stop your treatment for a short time or stop your treatment completely if you feel unwell.

If you vomit after taking Lorviqua

If you vomit after taking a dose of Lorviqua, do not take an extra dose, just take your next dose at the usual time.

If you take more Lorviqua than you should

If you accidentally take too many tablets, tell your doctor, pharmacist or nurse right away. You may require medical attention.

If you forget to take Lorviqua

What to do if you forget to take a tablet depends on how long it is until your next dose.

- If your next dose is in 4 hours or more, take the missed tablet as soon as you remember. Then take the next tablet at the usual time.
- If your next dose is in less than 4 hours away, skip the missed tablet. Then take the next tablet at the usual time.

Do not take a double dose to make up for a forgotten dose.

If you stop taking Lorviqua

It is important to take Lorviqua every day, for as long as your doctor asks you to. If you are not able to take the medicine as your doctor has prescribed, or you feel you do not need it anymore, speak with your doctor right away.

If you have any further questions on the use of this medicine, ask your doctor, pharmacist or nurse.

4. Possible side effects

Like all medicines, this medicine can cause side effects, although not everybody gets them.

Some side effects could be serious.

Tell your doctor straight away if you notice any of the following side effects (also section 2 **What you need to know before you take Lorviqua**). Your doctor may lower your dose, stop your treatment for a short time or stop your treatment completely:

- cough, shortness of breath, chest pain or worsening breathing problems
- slow pulse, (50 beats per minute or less), feeling tired, dizzy or faint or losing consciousness
- abdominal (belly) pain, back pain, nausea, vomiting, itching or yellowing of the skin and eyes
- mental status changes; changes in cognition including confusion, memory loss, reduced ability to concentrate; changes in mood including irritability and mood swings; changes in speech including difficulty speaking, such as slurred or slow speech; or loss of contact with reality, such as believing, seeing or hearing things that are not real

Other side effects of Lorviqua may include:

Very common: may affect more than 1 in 10 people

- increase in cholesterol and triglycerides (fats in your blood that would be detected during blood tests)
- limb or skin swelling
- problems with your eyes, such as difficulty seeing out of one or both eyes, double vision, or perceived flashes of light
- problems with the nerves in your arms and legs, such as pain, numbness, unusual sensations like burning or pins and needles, difficulty walking, or difficulty with usual activities of daily living such as writing
- increased level of enzymes called lipase and/or amylase in the blood that would be detected during blood tests
- low number of red blood cells known as anaemia that would be detected during blood tests
- diarrhoea
- constipation
- pain in your joints
- weight gain
- headache
- rash
- muscle pain
- increase in blood pressure

Common: may affect up to 1 in 10 people

- increase in blood sugar
- excess protein in the urine

Reporting of side effects

If you get any side effects, talk to your doctor, pharmacist or nurse. This includes any possible side effects not listed in this leaflet. You can also report side effects directly via the national reporting system listed in [Appendix V](#). By reporting side effects you can help provide more information on the safety of this medicine.

5. How to store Lorviqua

Keep this medicine out of the sight and reach of children.

Do not use this medicine after the expiry date which is stated on the blister foil and carton after “EXP”. The expiry date refers to the last day of that month.

This medicine does not require any special storage conditions.

Do not use this medicine if you notice that the package is damaged or shows signs of tampering.

Do not throw away any medicines via wastewater or household waste. Ask your pharmacist how to throw away medicines you no longer use. These measures will help protect the environment.

6. Contents of the pack and other information

What Lorviqua contains

- The active substance is lorlatinib.
Lorviqua 25 mg: each film-coated tablet (tablet) contains 25 mg lorlatinib.
Lorviqua 100 mg: each film-coated tablet (tablet) contains 100 mg lorlatinib.
- The other ingredients are:
Tablet core: microcrystalline cellulose, calcium hydrogen phosphate, sodium starch glycolate, magnesium stearate.
Film-coating: Hypromellose, lactose monohydrate, macrogol, triacetin, titanium dioxide (E171), iron oxide black (E172), and iron oxide red (E172).

See **Lorviqua contains lactose** and **Lorviqua contains sodium** in section 2.

What Lorviqua looks like and contents of the pack

Lorviqua 25 mg is supplied as round light pink film-coated tablets, debossed with “Pfizer” on one side and “25” and “LLN” on the other side.

Lorviqua 25 mg is provided in blisters of 10 tablets, which are available in packs containing 90 tablets (9 blisters).

Lorviqua 100 mg is supplied as oval dark pink film-coated tablets, debossed with “Pfizer” on one side and “LLN 100” on the other side.

Lorviqua 100 mg is provided in blisters of 10 tablets, which are available in packs containing 30 tablets (3 blisters).

Not all pack sizes may be marketed.

Marketing Authorisation Holder

Pfizer Europe MA EEIG
Boulevard de la Plaine 17
1050 Bruxelles
Belgium

Manufacturer

Pfizer Manufacturing Deutschland GmbH
Mooswaldallee 1
79108 Freiburg Im Breisgau
Germany

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

België/Belgique/Belgien
Luxembourg/Luxemburg
Pfizer NV/SA
Tél/Tel: +32 (0)2 554 62 11

Latvija
Pfizer Luxembourg SARL filiāle Latvijā
Tel: +371 670 35 775

България
Пфайзер Люксембург САРЛ, Клон България
Тел.: +359 2 970 4333

Lietuva
Pfizer Luxembourg SARL filialas Lietuvoje
Tel: +370 5 251 4000

Česká republika
Pfizer, spol. s r.o.
Tel: +420 283 004 111

Magyarország
Pfizer Kft.
Tel.: +36-1-488-37-00

Danmark
Pfizer ApS
Tlf.: +45 44 20 11 00

Malta
Vivian Corporation Ltd.
Tel: +356 21344610

Deutschland
PFIZER PHARMA GmbH
Tel: +49 (0)30 550055-51000

Nederland
Pfizer bv
Tel: +31 (0)800 63 34 636

Eesti
Pfizer Luxembourg SARL Eesti filiaal
Tel: +372 666 7500

Norge
Pfizer AS
Tlf: +47 67 52 61 00

Ελλάδα
Pfizer Ελλάς Α.Ε.
Τηλ: +30 210 6785800

Österreich
Pfizer Corporation Austria Ges.m.b.H.
Tel: +43 (0)1 521 15-0

España
Pfizer, S.L.
Tel: +34 91 490 99 00

Polska
Pfizer Polska Sp. z o.o.
Tel.: +48 22 335 61 00

France
Pfizer
Tél: +33 (0)1 58 07 34 40

Portugal
Laboratórios Pfizer, Lda.
Tel: +351 21 423 5500

Hrvatska
Pfizer Croatia d.o.o.
Tel: +385 1 3908 777

România
Pfizer Romania S.R.L.
Tel: +40 (0) 21 207 28 00

Ireland

Pfizer Healthcare Ireland Unlimited Company
Tel: +1800 633 363 (toll free)
Tel: +44 (0)1304 616161

Ísland

Icepharma hf.
Sími: +354 540 8000

Italia

Pfizer S.r.l.
Tel: +39 06 33 18 21

Κύπρος

Pfizer Ελλάς A.E. (Cyprus Branch)
Τηλ: +357 22817690

Slovenija

Pfizer Luxembourg SARL
Pfizer, podružnica za svetovanje s področja
farmacevtske dejavnosti, Ljubljana
Tel: +386 (0)1 52 11 400

Slovenská republika

Pfizer Luxembourg SARL, organizačná zložka
Tel: +421 2 3355 5500

Suomi/Finland

Pfizer Oy
Puh/Tel: +358 (0)9 430 040

Sverige

Pfizer AB
Tel: +46 (0)8 550 520 00

This leaflet was last revised in {MM/YYYY}.

Other sources of information

Detailed information on this medicine is available on the European Medicines Agency web site:
<https://www.ema.europa.eu>.