

PRODUCT MONOGRAPH
INCLUDING PATIENT MEDICATION INFORMATION

PrPIQRAY®

Alpelisib tablets

Tablets, 50 mg, 150 mg and 200 mg, Oral

Antineoplastic Agent

ATC L01XE47

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PIQRAY is a registered trademark

RECENT MAJOR LABEL CHANGES

Not applicable

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PART I: HEALTH PROFESSIONAL INFORMATION

1 INDICATIONS

PIQRAY® (alpelisib), in combination with fulvestrant, is indicated for the treatment of postmenopausal women, and men, with hormone receptor-positive, HER2-negative, PIK3CA-mutated advanced or metastatic breast cancer after disease progression following an endocrine-based regimen.

Geriatrics (≥ 65 years of age): No overall differences in the efficacy of PIQRAY were observed between patients ≥ 65 years of age compared to younger patients (see 7. WARNINGS AND PRECAUTIONS, Special Populations, Geriatrics).

Paediatrics (< 18 years of age): The safety and efficacy of PIQRAY in paediatric patients have not been established. PIQRAY is not authorised for use in paediatric patients.

2 CONTRAINDICATIONS

PIQRAY is contraindicated in patients who are hypersensitive to this drug or to any ingredient in the formulation, including any non-medicinal ingredient, or component of the container. For a complete listing, see 6. DOSAGE FORMS, STRENGTHS, COMPOSITION AND PACKAGING.

3 SERIOUS WARNINGS AND PRECAUTIONS BOX

Serious Warnings and Precautions

Treatment with PIQRAY should be initiated by a physician experienced in the use of anti-cancer agents.

The following serious adverse reactions were reported in patients treated with PIQRAY.

- Hypersensitivity, including anaphylactic reaction (see 7. *WARNING AND PRECAUTIONS, Immune*)
- Severe cutaneous reactions including Stevens-Johnson Syndrome, Drug Reaction with Eosinophilia and Systemic Symptoms and Erythema Multiforme (see 7. *WARNING AND PRECAUTIONS, Skin*)
- Hyperglycaemia, including diabetic ketoacidosis (see 7. *WARNING AND PRECAUTIONS, Endocrine and Metabolism*)
- Pneumonitis (see 7. *WARNING AND PRECAUTIONS, Respiratory*)

4 DOSAGE AND ADMINISTRATION

4.1 Dosing Considerations

Patients with hormone receptor (HR) positive, HER2-negative advanced breast cancer, should be selected for treatment with PIQRAY based on the presence of a PIK3CA mutation using a validated test. There was no treatment benefit demonstrated in breast cancer patients without a PIK3CA mutation, in the phase III clinical study; therefore, treatment with PIQRAY is not

recommended for these patients (see 14. CLINICAL TRIALS).

4.2 Recommended Dose and Dosage Adjustment

The recommended dose of PIQRAY is 300 mg (2x150 mg film-coated tablets) taken orally, once daily on a continuous basis. PIQRAY should be taken immediately following food, at approximately the same time each day (see 10. ACTION AND CLINICAL PHARMACOLOGY and 9. DRUG INTERACTIONS).

The maximum recommended daily dose of PIQRAY is 300 mg.

If patient vomits after taking the PIQRAY dose, the patient should not take an additional dose on that day, and should resume the usual dosing schedule the next day, at the usual time.

When co-administered with PIQRAY, the recommended dose of fulvestrant is 500 mg administered intramuscularly on days 1, 15 and 29 and every 28 days thereafter. Please refer to the full prescribing information in the fulvestrant Product Monograph.

Treatment should continue as long as clinical benefit is observed or until unacceptable toxicity occurs. Dosing modifications may be necessary to improve tolerability.

Dose modifications

Management of severe or intolerable adverse drug reactions may require temporary dosing interruption, reduction, and/or discontinuation of PIQRAY. The dosing reduction guidelines for adverse drug reactions (ADRs) are listed in Table 4-1. A maximum of 2 dosing reductions are recommended, after which the patient should be discontinued from treatment with PIQRAY (see also 14. CLINICAL TRIALS). Dose reduction should be based on worst preceding toxicity.

In the phase III study, patients who discontinued PIQRAY were to continue taking fulvestrant as per the treating physician's clinical judgment.

Table 4-1 Recommended dose reduction guidelines for adverse drug reactions

PIQRAY dose level	Dose and schedule	Number and strength of tablets
Starting dose	300 mg/day continuously	2 x 150 mg tablets
First dose reduction	250 mg/day continuously ¹	1 x 200 mg tablet and 1 x 50 mg tablet
Second dose reduction	200 mg/day continuously ²	1 x 200 mg tablet

¹ Only one dose reduction is permitted for pancreatitis
² If further dose reduction below 200 mg/day is required, discontinue PIQRAY

Tables 4-2, 4-3 and 4-4 summarize recommendations for dosing interruption, reduction or discontinuation of PIQRAY in the management of specific ADRs. Clinical judgment of the treating physician, including confirmation of laboratory values if deemed necessary, should guide the management plan of each patient based on the individual benefit/risk assessment for treatment with PIQRAY.

Hyperglycaemia

PIQRAY can cause hyperglycaemia. Consultation with a physician experienced in the treatment of hyperglycaemia should always be considered and is recommended for patients with fasting glucose > 250 mg/dL. Patients should be instructed on lifestyle changes that may reduce hyperglycaemia.

Dose adjustment should be based on fasting glucose values (Table 4-2). Perform fasting plasma glucose and/or HbA1c (haemoglobin A1c test) before initiating treatment with PIQRAY.

Glucose levels should be corrected in patients with abnormal fasting glucose levels in the range of pre-diabetic or diabetic before initiating PIQRAY, and should be closely monitored to enable early detection and early treatment of hyperglycaemia.

After initiating treatment with PIQRAY, monitor fasting glucose at least once per week in the first 2 weeks, followed by every 4 weeks and as clinically indicated. HbA1c should be monitored every 3 months and as clinically indicated.

If patient experiences hyperglycaemia after initiating treatment with PIQRAY, monitor fasting glucose as clinically indicated, and at least twice weekly until fasting glucose decreases to ≤ 160 mg/dL. During treatment with anti-diabetic medication, continue monitoring fasting glucose at least once a week for 8 weeks, followed by once every 2 weeks and as clinically indicated.

Table 4-2 Dose modification and management for hyperglycaemia

Fasting Glucose ¹	Recommendation
Grade 1 Fasting glucose > ULN - 160 mg/dL or > ULN - 8.9 mmol/L	No PIQRAY dose adjustment required. Initiate or intensify oral anti-diabetic treatment ² .
Grade 2 Fasting glucose > 160 - 250 mg/dL > 8.9 - 13.9 mmol/L	No PIQRAY dose adjustment required. Initiate or further intensify oral anti-diabetic treatment ² . If fasting glucose does not decrease to ≤ 160 mg/dL or 8.9 mmol/L within 21 days with appropriate oral anti-diabetic treatment, reduce PIQRAY dose by 1 dose level, and follow fasting glucose value specific recommendations.
Grade 3 > 250 - 500 mg/dL or > 13.9 - 27.8 mmol/L	Interrupt PIQRAY. Initiate or intensify oral anti-diabetic treatment ² and consider additional anti-diabetic medications ³ for 1-2 days until hyperglycaemia improves. Administer intravenous hydration and consider appropriate treatment (e.g. intervention for electrolyte/ketoacidosis/hyperosmolar disturbances). <ul style="list-style-type: none"> • If fasting glucose decreases to ≤ 160 mg/dL or 8.9 mmol/L within 3 to 5 days under appropriate anti-diabetic treatment, resume PIQRAY at next lower dose level. • If fasting glucose does not decrease to ≤ 160 mg/dL or 8.9 mmol/L within 3 to 5 days under appropriate anti-diabetic treatment, consultation with a physician with expertise in the treatment of hyperglycaemia is recommended. • If fasting glucose does not decrease to ≤ 160 mg/dL or 8.9 mmol/L within 21 days following appropriate anti-diabetic treatment², permanently discontinue PIQRAY treatment.

Fasting Glucose ¹	Recommendation
Grade 4 > 500 mg/dL or ≥ 27.8 mmol/L	Interrupt PIQRAY Initiate or intensify appropriate anti-diabetic treatment ² (administer intravenous hydration and consider appropriate treatment (e.g. intervention for electrolyte/ketoacidosis/hyperosmolar disturbances)). Re-check fasting glucose within 24 hours and as clinically indicated. <ul style="list-style-type: none"> • If fasting glucose decreases to ≤ 500 mg/dL or ≤ 27.8 mmol/L, then follow fasting glucose value-specific recommendations for ≤ 500 mg/dL. • If fasting glucose is confirmed at > 500 mg/dL or > 27.8 mmol/L, permanently discontinue PIQRAY treatment.
<p>¹ Fasting glucose (FPG/Fasting blood glucose) levels reflect hyperglycaemia grading according to CTCAE Version 4.03. CTCAE=Common Terminology Criteria for Adverse Events.</p> <p>² Initiate applicable anti-diabetic medications, like metformin and insulin sensitizers (such as thiazolidinediones or dipeptidyl peptidase-4 inhibitors) and review respective prescribing information for dosing and dose titration recommendations, including local diabetic treatment guidelines. Metformin was recommended in the phase III clinical study with the following guidance: <i>Initiate metformin 500 mg once daily. Based on tolerability, metformin dose may be increased to 500 mg bid, followed by 500 mg with breakfast, and 1000 mg with dinner, followed by further increase to 1000 mg bid if needed (see 7. WARNINGS AND PRECAUTIONS).</i></p> <p>³ As recommended in the phase III clinical study, insulin may be used for 1-2 days until hyperglycaemia resolves. However, this may not be necessary in the majority of alpelisib-induced hyperglycaemia, given the short half-life of alpelisib and the expectation of glucose levels normalizing after interruption of PIQRAY.</p>	

Rash and severe cutaneous reactions

PIQRAY can cause rash and severe cutaneous reactions (see 7. WARNINGS AND PRECAUTIONS, Skin). Oral antihistamine administration may be considered prophylactically, at the time of initiation of treatment with PIQRAY. Based on the severity of cutaneous reactions, PIQRAY may require dose interruption, reduction, or discontinuation as described in Table 4-3. Dermatologist consultation is recommended for any severe cutaneous reactions such as Stevens-Johnson syndrome (SJS), toxic epidermal necrolysis (TEN), drug reaction with eosinophilia and systemic symptoms (DRESS) and erythema multiforme (EM).

Table 4-3 Dose modification and management for rash and severe cutaneous reactions

Grade ^{1,2}	Recommendation
Grade 1 (< 10% body surface area (BSA) with active skin toxicity)	No PIQRAY dose adjustment required. Initiate topical corticosteroid treatment. Consider adding oral antihistamine treatment to manage symptoms.
Grade 2 (10% - 30% BSA with active skin toxicity)	No PIQRAY dose adjustment required. Initiate or intensify topical corticosteroid and oral antihistamine treatment. Consider low dose oral corticosteroid treatment.
Grade 3 (e.g., severe rash not responsive to medical management) (> 30% BSA with active skin toxicity)	Interrupt PIQRAY until rash is ≤ Grade 1. Initiate or intensify topical/oral corticosteroid and anti-histamine treatment. Once improved to ≤ Grade 1, then resume PIQRAY at the same dose

Grade ^{1,2}	Recommendation
	level for first occurrence of rash and at next lower dose level, in case of second occurrence.
Grade 4 (e.g.: severe bullous, blistering or exfoliating skin conditions) (any % BSA associated with extensive superinfection, with IV antibiotics indicated; life-threatening consequences) or Stevens-Johnson Syndrome (SJS), Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS), Toxic Epidermal Necrolysis (TEN), or any other severe cutaneous reaction.	Permanently discontinue PIQRAY.
¹ Grading according to CTCAE Version 5.0	
² For all grades of rash, consider consultation with a dermatologist	

Table 4-4 Dose modification and management for diarrhoea

Grade ¹	Recommendation
Grade 1	No PIQRAY dose adjustment required. Initiate appropriate medical therapy and monitor as clinically indicated.
Grade 2	Initiate appropriate medical therapy and monitor as clinically indicated. Interrupt PIQRAY dose until improvement to Grade ≤1, then resume PIQRAY at the same dose level.
Grade 3 and 4	Initiate appropriate medical therapy and monitor as clinically indicated. Interrupt PIQRAY dose until improvement to Grade ≤1, then resume PIQRAY at the next lower dose level.
¹ Grading according to CTCAE Version 5.0	

Other toxicities

Table 4-5 Dose modification and management for other toxicities*

Grade ¹	Recommendation ^{2,3,4}
Grade 1 or 2	No PIQRAY dose adjustment required. Initiate appropriate medical therapy and monitor as clinically indicated.
Grade 3	Interrupt PIQRAY dose until improvement to Grade ≤1, then resume PIQRAY at the next lower dose level.
Grade 4	Permanently discontinue PIQRAY.
* Excluding hyperglycaemia, rash and severe cutaneous reactions and diarrhoea	
¹ Grading according to CTCAE Version 5.0	
² For Grade 2 increased creatinine, interrupt PIQRAY dose until improvement to Grade ≤1 and resume at the same dose if resolved in ≤ 7 days, or resume at the next lower dose level if resolved in > 7 days. For Grade 3 increased creatinine, permanently discontinue PIQRAY.	
³ For patients with normal baseline ALT and AST and total bilirubin, who develop AST or ALT > 3.0 x ULN and total bilirubin > 2.0 x ULN, or patients with elevated baseline ALT and AST and total bilirubin, who develop AST or ALT > 8.0 x ULN, combined with total bilirubin >2x baseline, permanently discontinue PIQRAY.	
⁴ For Grade 2 and 3 pancreatitis, interrupt PIQRAY dose until recovery to Grade ≤ 1 and resume at next lower dose level. Only one dose reduction is permitted. If toxicity re-occurs, permanently discontinue PIQRAY treatment.	

Refer to the full prescribing information for fulvestrant for dose modification guidelines in the event of toxicity and other relevant safety information.

Special populations

Renal impairment

No dose adjustment is recommended for patients with mild (eGFR 60 to < 90 mL/min/1.73 m²) and moderate renal impairment (eGFR 30 to < 60 mL/min/1.73 m²).

The effect of severe renal impairment (eGFR < 30 mL/min/1.73 m²) on alpelisib pharmacokinetics is unknown (see 10. ACTION AND CLINICAL PHARMACOLOGY, Special Populations and Conditions).

Hepatic impairment

No dose adjustment is necessary in patients with mild, moderate or severe hepatic impairment (Child-Pugh class A, B or C, respectively) (see 10. ACTION AND CLINICAL PHARMACOLOGY, Special Populations and Conditions).

Refer to the full prescribing information in the fulvestrant Product Monograph for dose modifications related to hepatic impairment.

4.3 Administration

PIQRAY tablets should be swallowed whole (tablets should not be chewed, crushed or split prior to swallowing). Tablets that are broken, cracked, or otherwise not intact should not be ingested.

4.4 Missed Dose

If a dose of PIQRAY is missed, it can be taken immediately following food and within 9 hours after the time it is usually administered. After more than 9 hours, the dose should be skipped for that day. On the next day, PIQRAY should be taken at its usual time. The dose should not be doubled in case of a missed dose.

5 OVERDOSAGE

There is limited experience of overdose with PIQRAY in clinical studies. In clinical studies, PIQRAY was administered at doses up to 450 mg once daily. Higher incidences of commonly reported adverse events associated with these higher doses were observed, which included, but were not limited to, hyperglycaemia, nausea, diarrhoea, vomiting, asthenia and rash.

In all cases of overdosage with PIQRAY, general symptomatic and supportive measures should be initiated. There is no known antidote for PIQRAY.

For management of a suspected drug overdose, contact your regional poison control centre.

6 DOSAGE FORMS, STRENGTHS, COMPOSITION AND PACKAGING

Dosage Forms, Strengths, Composition and Packaging

Route of Administration	Dosage Form / Strength / Composition	Non-medicinal Ingredients
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Oral	Tablet 50 mg, 150 mg, 200 mg alpelisib	Film-coated tablet core: hypromellose, magnesium stearate, mannitol, microcrystalline cellulose, sodium starch glycolate Tablet coating: hypromellose, iron oxide black, iron oxide red, macrogol / polyethylene glycol (PEG), talc, titanium dioxide
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50 mg PIQRAY tablet: Light pink, unscored, round and curved with bevelled edges, imprinted with “L7” on one side and “NVR” on the other side.

150 mg PIQRAY tablet: Pale red, unscored, ovaloid and curved with bevelled edges, imprinted with “UL7” on one side and “NVR” on the other side.

200 mg PIQRAY tablet: Light red, unscored, ovaloid and curved with bevelled edges, imprinted with “YL7” on one side and “NVR” on the other side.

PIQRAY is supplied in aluminium PVC/PCTFE blisters and are available in the following pack sizes:

300 mg daily dose: each carton contains 4 blister packs. Each blister pack contains a 7-day supply of 14 tablets (56 tablets, 150 mg alpelisib per tablet).

250 mg daily dose: each carton contains 4 blister packs. Each blister pack contains a 7-day supply of 14 tablets (28 tablets, 200 mg alpelisib per tablet and 28 tablets, 50 mg alpelisib per tablet).

200 mg daily dose: each carton contains 2 blister packs. Each blister pack contains a 14-day supply of 14 tablets (28 tablets, 200 mg of alpelisib per tablet).

7 WARNINGS AND PRECAUTIONS

Please see the Serious Warnings and Precautions Box at the beginning of Part I: Health Professional Information.

Endocrine and Metabolism

Hyperglycaemia

Severe hyperglycaemia, including diabetic ketoacidosis, has been reported in patients treated with PIQRAY. Hyperglycaemia was reported in 66% of patients treated with PIQRAY and 53% of patients initiated anti-diabetic treatment in the phase III clinical study. Grade 3 (fasting glucose > 250 – 500 mg/dL) and Grade 4 (fasting glucose > 500 mg/dL) hyperglycaemia were reported in 33% and 5% of patients, respectively. Patients considered pre-diabetic or diabetic at baseline were at a higher risk of developing severe hyperglycaemia and associated complications (e.g. ketoacidosis). Patients with type I or uncontrolled type II diabetes mellitus were excluded from the phase III clinical study.

Among the patients who had Grade \geq 2 (fasting glucose > 160 – 250 mg/dL) hyperglycaemia in the phase III study, the median time to first occurrence of Grade \geq 2 hyperglycaemia was 15 days (range: 5 to 517 days). The median duration of Grade 2 or higher hyperglycaemia was 10 days.

Hyperglycaemia was manageable with appropriate oral anti-diabetic therapy and PIQRAY dose modifications or discontinuation (see 4. DOSAGE AND ADMINISTRATION, Table 4-2). Among the 187 patients with reported hyperglycaemia event, 87% of patients were managed with anti-diabetic medication (e.g. metformin), 41% of patients with dose interruption, 44% of patients with dose reduction, and 10% of patients with permanent discontinuation.

Advise patients of the signs and symptoms of hyperglycaemia (e.g. excessive thirst, urinating more often than usual or higher amount of urine than usual, increased appetite with weight loss).

Perform fasting glucose and/or HbA1c before initiating treatment with PIQRAY. After initiating treatment with PIQRAY, monitor fasting glucose at least once per week in the first 2 weeks, followed by at least every 4 weeks and as clinically indicated. Monitor HbA1c every 3 months as clinically indicated. Correct glucose levels in patients with abnormal fasting glucose levels before initiating PIQRAY, and closely monitor fasting glucose levels to enable early detection and early treatment of hyperglycaemia.

If patient experiences hyperglycaemia after initiating treatment with PIQRAY, monitor fasting glucose as clinically indicated, and at least twice weekly until fasting glucose decreases to ≤ 160 mg/dL. During treatment with anti-diabetic medication, continue monitoring fasting glucose at least once a week for 8 weeks, followed by once every 2 weeks and as clinically indicated.

Gastrointestinal

Diarrhoea, nausea and vomiting

Severe diarrhoea and clinical consequences, such as dehydration and acute kidney injury, have been reported during treatment with PIQRAY (see 8. ADVERSE REACTIONS). In the phase III study, gastrointestinal toxicity (nausea, vomiting and diarrhoea) were reported in 75% of patients treated with PIQRAY. Grade 3 gastrointestinal events (mostly diarrhoea) were reported in 9% of patients and serious gastrointestinal events in 4% of patients. Among patients with Grade ≥ 2 diarrhoea, median time to onset of the first event was 46 days (range: 1 to 442 days). Anti-emetics (e.g., ondansetron) and anti-diarrheal medications (e.g., loperamide) were used in 18% and 63% of patients to manage gastrointestinal symptoms.

Patients experiencing gastrointestinal toxicity should be managed according to local standards of care, including electrolyte monitoring, administration of anti-emetics and antidiarrheal medications and/or fluid replacement and electrolyte supplements, as clinically indicated. Dose modifications of PIQRAY are recommended in patients with Grade ≥ 2 diarrhoea (see 4. DOSAGE AND ADMINISTRATION, Table 4-4).

Immune

Hypersensitivity and anaphylactic reaction

Serious hypersensitivity reactions including anaphylactic reaction and anaphylactic shock, manifested by symptoms including, but not limited to, dyspnoea, flushing, rash, fever or tachycardia were reported in patients treated with PIQRAY in clinical trials. In the phase III clinical trial, hypersensitivity events were reported in 16.5% of patients treated with PIQRAY. The most common adverse events reported were hypersensitivity (3.5%), face oedema (2.8%) and swelling face (2.1%). The incidence of serious hypersensitivity reaction was 1.8%. Hypersensitivity and anaphylactic reactions were more common in Asian patients compared to other races. PIQRAY should be permanently discontinued and should not be re-introduced in patients with serious hypersensitivity reactions (see 2. CONTRAINDICATIONS).

Musculoskeletal

Osteonecrosis of the jaw (ONJ)

In the phase III clinical study, osteonecrosis of the jaw (ONJ) was reported in 4% of patients in the PIQRAY plus fulvestrant arm, including 2% with a serious event. All patients experiencing ONJ were also exposed to prior or concomitant bisphosphonates or denosumab. Caution

should be exercised when PIQRAY and drugs known to cause ONJ are used either simultaneously, or sequentially. PIQRAY treatment should not be initiated in patients with ongoing ONJ. Patients should be advised to promptly report any new or worsening oral symptoms (such as dental mobility, pain or swelling, non-healing of mouth sores, or discharge) during treatment with PIQRAY. A dental examination with appropriate preventive dentistry is recommended prior to treatment with PIQRAY in patients with risk factors for ONJ, such as invasive dental procedures, concomitant therapies, poor oral hygiene and comorbid disorders.

In patients who develop ONJ, standard medical management should be initiated, including maintaining good oral hygiene, controlling pain and treating areas of infection with antibiotics and oral antibiotic mouth rinses. Patients should have appropriate nutrition and oral fluid intake.

Respiratory

Pneumonitis

Pneumonitis, including serious cases of pneumonitis/acute interstitial lung disease, have been reported in clinical trials. In the phase III clinical study, pneumonitis was reported in 5 (2%) of patients treated with PIQRAY (see 8. ADVERSE REACTIONS). Advise patients to promptly report any new or worsening respiratory symptoms. In patients who have new or worsening respiratory symptoms or are suspected to have developed pneumonitis, interrupt PIQRAY treatment immediately and evaluate the patient for pneumonitis. Consider a diagnosis of non-infectious pneumonitis in patients presenting with non-specific respiratory signs and symptoms such as hypoxia, cough, dyspnoea, or interstitial infiltrates on radiologic exams and in whom infectious, neoplastic, and other causes have been excluded by means of appropriate investigations. Permanently discontinue PIQRAY in all patients with confirmed pneumonitis.

Skin

Severe cutaneous reactions

Severe cutaneous reactions have been reported with PIQRAY (see 8. ADVERSE REACTIONS). In the phase III study, Stevens-Johnson syndrome (SJS) and erythema multiforme (EM) were reported in 1 (< 1%) and 3 (1%) patients, respectively. Drug reaction with eosinophilia and systemic symptoms (DRESS) has been reported in the post marketing setting. Do not initiate PIQRAY treatment in patients with history of severe cutaneous reactions.

Advise patients of the signs and symptoms of severe cutaneous reactions (e.g. a prodrome of fever, flu-like symptoms, mucosal lesions or progressive skin rash). If signs or symptoms of severe cutaneous reactions are present, interrupt PIQRAY until the etiology of the reaction has been determined. Consultation with a dermatologist is recommended. If a severe cutaneous reaction is confirmed, permanently discontinue PIQRAY. Do not reintroduce PIQRAY in patients who have experienced previous severe cutaneous reactions. PIQRAY treatment may require interruption, dose reduction, or discontinuation as described in Table 4-3 Dose modification and management for rash and severe cutaneous reactions (see 4. DOSAGE AND ADMINISTRATION).

Rash

In the phase III clinical study, rash (including rash maculo-papular, rash macular, rash generalised, rash papular, rash pruritic, dermatitis and dermatitis acneiform) were reported in 54% patients treated with PIQRAY plus fulvestrant. Rash as serious adverse events and discontinuation of PIQRAY due to a rash was reported in 3.5% and 4.2% of patients, respectively. Grade ≥ 2 rash were reported in 34% and the median time to first onset was 12 days (range: 2 to 220 days). Antihistamines, topical or systemic low-dose corticosteroids, and PIQRAY dose modification (see 4. DOSAGE AND ADMINISTRATION) were used to manage

rash.

Sexual Health

Reproduction

The pregnancy status for females of reproductive potential should be verified prior to starting treatment with PIQRAY.

Females of reproductive potential should be advised of the potential harm to the developing foetus (see 15. NONCLINICAL TOXICOLOGY). Advise sexually-active females of reproductive potential to use effective contraception (methods that result in less than 1% pregnancy rates) when using PIQRAY, during treatment and for at least 1 week after stopping treatment. It is currently unknown whether PIQRAY may reduce the effectiveness of systemically acting hormonal contraceptives.

Advise male patients with sexual partners who are pregnant, possibly pregnant, or who could become pregnant, to use condoms during sexual intercourse while taking PIQRAY and for at least 1 week after stopping treatment with PIQRAY. Male patients are also advised not to donate or store semen during treatment and at least 1 week after the last dose of PIQRAY.

Fertility

There is no data on the effect of alpelisib on human fertility. Based on repeated dose toxicity studies on animals, PIQRAY may impair fertility in males and females of reproductive potential (see 15. NON-CLINICAL TOXICOLOGY).

7.1 Special Populations

7.1.1 Pregnant Women

There are no data regarding the use of PIQRAY in pregnant women. Embryo-foetal development studies have demonstrated that oral administration of alpelisib during organogenesis increased embryo-foetal death and teratogenicity in rats and rabbits, at doses below the exposure in humans (see 15. NON-CLINICAL TOXICOLOGY). Based on the animal data and its mechanism of action, PIQRAY can cause foetal harm when administered to a pregnant woman.

Do not use PIQRAY during pregnancy and in women of childbearing potential not using effective contraception. If the patient becomes pregnant while taking PIQRAY, inform the patient of the potential hazard to the foetus.

7.1.2 Breast-feeding

It is not known if alpelisib is transferred into human or animal milk after administration of PIQRAY. There are no data on the effects of alpelisib on the breastfed child or the effects of alpelisib on milk production.

Because of the potential for serious adverse reactions in the breastfed child from PIQRAY, it is recommended that women should not breastfeed during treatment and for at least 1 week after the last dose of PIQRAY.

7.1.3 Pediatrics (< 18 years of age)

The safety and efficacy of PIQRAY in paediatric patients have not been established.

7.1.4 Geriatrics

Of the 284 patients who received PIQRAY plus fulvestrant in the phase III study, 41% of the

patients were ≥ 65 years of age, including 12% ≥ 75 years of age. No overall differences in safety or effectiveness of PIQRAY were observed between these patients and younger patients; however, gastrointestinal toxicity (primarily diarrhoea and nausea), hyperglycaemia, weight decreased, hypokalaemia and dyspnoea were reported more frequently in older patients.

7.1.5 Race

Of the 284 patients who received PIQRAY plus fulvestrant in the phase III study, 21% of the patients were Asians. Rash, severe cutaneous reactions, hypersensitivity and anaphylactic reaction, and pancreatitis were more frequently reported in Asian patients compared to Caucasian patients.

8 ADVERSE REACTIONS

8.1 Adverse Reaction Overview

The overall safety evaluation of PIQRAY is based on data from the phase III clinical study of 572 patients (571 post-menopausal women and 1 male patient) who were enrolled into two cohorts, with or without a PIK3CA mutation. Patients were then randomized in a 1:1 ratio to receive PIQRAY plus fulvestrant or placebo plus fulvestrant. Overall, in the safety set (n=571), 284 patients received PIQRAY in combination with fulvestrant at the recommended starting dose of 300 mg, and 287 patients received placebo in combination with fulvestrant.

The median duration of exposure to PIQRAY plus fulvestrant was 8.2 compared to 5.6 months to placebo and fulvestrant.

Almost all patients (99.3%) in the PIQRAY plus fulvestrant group (vs. 92.0% in the placebo plus fulvestrant group) experienced at least one adverse event. The most common adverse reactions in PIQRAY plus fulvestrant-treated patients (reported at a frequency $\geq 20\%$ and for which the frequency for PIQRAY plus fulvestrant exceeds the frequency for placebo plus fulvestrant) were hyperglycaemia, diarrhoea, rash, nausea, fatigue and asthenia, decreased appetite, stomatitis, vomiting and weight decreased.

Severe (Grade 3 or 4) adverse events were more frequently reported in the PIQRAY plus fulvestrant group (76% vs. 36% in the placebo plus fulvestrant arm). The most common Grade ≥ 3 adverse reactions (reported at a frequency $\geq 2\%$ in the PIQRAY plus fulvestrant arm and for which the frequency for PIQRAY plus fulvestrant exceeds the frequency for placebo plus fulvestrant) were hyperglycaemia, rash and rash maculo-papular, diarrhoea, lipase increased, hypertension, hypokalaemia, weight decreased, fatigue and asthenia, anaemia, nausea, stomatitis, alanine aminotransferase increased, lymphopenia and mucosal inflammation.

Two patients died during treatment with PIQRAY plus fulvestrant due to causes other than the underlying disease (one cardio-respiratory arrest and one second primary malignancy). Neither was considered related to treatment with PIQRAY.

PIQRAY dose reductions due to adverse events (AEs), regardless of causality occurred in 58% of patients receiving PIQRAY plus fulvestrant and in 5% of patients receiving placebo plus fulvestrant. Permanent discontinuation of PIQRAY and/or fulvestrant due to adverse events were reported in 25% of patients, compared to 5% with placebo and/or fulvestrant. The most common AEs leading to treatment discontinuation of both PIQRAY and fulvestrant were hyperglycaemia (6%), rash (3%), diarrhoea (3%) and fatigue (2%).

8.2 Clinical Trial Adverse Reactions

Because clinical trials are conducted under very specific conditions, the adverse reaction rates

observed in the clinical trials may not reflect the rates observed in practice and should not be compared to the rates in the clinical trials of another drug. Adverse reaction information from clinical trials is useful for identifying drug-related adverse events and for approximating rates.

Adverse reactions from the phase III clinical study (Table 8-1) are listed by MedDRA system organ class and ranked by frequency within each system organ class.

Table 8-1 Adverse reactions occurring in $\geq 10\%$ of patients and with $\geq 2\%$ higher incidence in the PIQRAY arm (all grades) in the phase III SOLAR-1 study

Adverse reactions	PIQRAY plus fulvestrant N = 284			Placebo plus fulvestrant N = 287		
	All Grades %	Grade 3 %	Grade 4 %	All Grades %	Grade 3 %	Grade 4 %
Blood and lymphatic system disorders						
Anaemia	10	4	0	5	1	0
Gastrointestinal disorders						
Diarrhoea	58	7	0	16	<1	0
Nausea	45	2	0	22	<1	0
Stomatitis ¹	30	2	0	6	0	0
Vomiting	27	<1	0	10	<1	0
Abdominal pain	17	1	0	11	1	0
Dyspepsia	11	0	0	6	0	0
General disorders and administration site conditions						
Fatigue ²	42	5	0	29	1	0
Mucosal inflammation	19	2	0	1	0	0
Oedema peripheral	15	0	0	5	<1	0
Pyrexia	14	<1	<1	5	<1	0
Mucosal dryness ³	12	<1	0	4	0	0
Infections and infestations						
Urinary tract infection ⁴	10	<1	0	5	1	0
Investigations						
Weight decreased	27	4	0	2	0	0
Blood creatinine increased	10	2	0	1	0	0
Metabolism and nutrition disorders						
Hyperglycaemia	65	33	4	10	<1	<1
Decreased appetite	36	<1	0	10	<1	0
Nervous system disorders						
Dysgeusia ⁵	18	<1	0	3	0	0
Headache	18	<1	0	13	0	0

	PIQRAY plus fulvestrant N = 284			Placebo plus fulvestrant N = 287		
Skin and subcutaneous tissue disorders						
Rash ⁶	52	20	0	7	<1	0
Alopecia	20	0	0	2	0	0
Pruritus	18	<1	0	6	0	0
Dry skin ⁷	18	<1	0	4	0	0
Grading according to CTCAE Version 4.03						
¹ Stomatitis: including stomatitis, aphthous ulcer and mouth ulceration						
² Fatigue: including fatigue, asthenia						
³ Mucosal dryness: including dry mouth, mucosal dryness, vulvovaginal dryness						
⁴ Urinary tract infection: including UTI and single case of urosepsis						
⁵ Dysgeusia : including dysgeusia, ageusia, hypogeusia						
⁶ Rash: including rash, rash maculo-papular, rash macular, rash generalized, rash papular, rash pruritic						
⁷ Dry skin: including dry skin, skin fissures, xerosis, xeroderma						

8.3 Less Common Clinical Trial Adverse Reactions

Other clinically significant adverse drug reactions reported in < 10% of patients and with higher incidences reported in the PIQRAY arm (all grades) are presented below.

Blood and lymphatic system disorders: lymphopenia (5%), thrombocytopenia (2%)

Eye disorders: vision blurred (5%), dry eye (4%)

Gastrointestinal disorders: toothache (4%), gingivitis (4%), cheilitis (3%), gingival pain (3%), pancreatitis (<1%)

General disorders and administration site conditions: oedema (6%)

Immune system disorders: hypersensitivity (4%)

Investigations: gamma-glutamyltransferase increased (9.5%), alanine aminotransferase increased (8%), lipase increased (6%), glycosylated haemoglobin increased (3%)

Metabolism and nutrition disorders: hypokalaemia (9.9%), hypocalcaemia (4%), dehydration (4%), ketoacidosis (<1%)

Musculoskeletal and connective tissue disorders: muscle spasms (7%), myalgia (7%), osteonecrosis of jaw (4%)

Psychiatric disorders: insomnia (7%)

Renal and urinary disorders: acute kidney injury (5%)

Respiratory, thoracic and mediastinal disorders: pneumonitis (2%)

Skin and subcutaneous tissue disorders: erythema (6%), dermatitis (4%), palmar-plantar erythrodysesthesia syndrome (2%), erythema multiforme (1%), Stevens-Johnson syndrome (<1%)

Vascular disorders: hypertension (8.5%), lymphedema (5%)

8.4 Abnormal Laboratory Findings: Hematologic, Clinical Chemistry and Other Quantitative Data

Table 8-2 Laboratory abnormalities occurring in ≥ 10% of patients and with ≥ 5%

incidence in the PIQRAY plus fulvestrant arm in the phase III SOLAR-1 study

Laboratory Abnormality	PIQRAY plus fulvestrant N = 284			Placebo plus fulvestrant N = 287		
	All Grades %	Grade 3 %	Grade 4 %	All Grades %	Grade 3 %	Grade 4 %
Haematological parameters						
Lymphocyte decreased	52	7	1	40	5	0
Haemoglobin decreased	42	4	0	29	1	0
Activated Partial Thromboplastin Time increased	21	<1	0	16	<1	0
Platelet decreased	14	<1	<1	6	0	0
Biochemical parameters						
Glucose increased	79	33	5	34	<1	<1
Creatinine increased	67	3	0	25	<1	0
Gamma Glutamyl Transferase increased	52	10	1	44	8	2
Alanine Aminotransferase increased	44	3	<1	34	2	0
Lipase, Pancreatic increased	42	6	1	25	5	1
Calcium Corrected decreased	27	2	<1	20	<1	1
Glucose decreased	26	0	<1	14	0	0
Potassium decreased	14	5	1	3	<1	0
Albumin decreased	14	0	0	8	0	0
Magnesium decreased	11	<1	0	4	0	0

8.5 Clinical Trial Adverse Drug Reactions (Paediatrics)

The safety and efficacy of PIQRAY in paediatric patients have not been established.

8.6 Post-Market Adverse Reactions

The following adverse reactions have been identified during post-market use of PIQRAY. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish a causal relationship to drug exposure.

Skin and subcutaneous tissue disorders: Drug reaction with eosinophilia and systemic symptoms (DRESS)

9 DRUG INTERACTIONS

9.1 Overview

In-vitro assessment of drug interactions

Alpelisib inhibits CYP3A4 in a time-dependent manner and induces cytochromes CYP2B6, CYP2C9 and CYP3A4.

Alpelisib is an inhibitor of P-gp (P-glycoprotein). Alpelisib has a low potential to inhibit BCRP (Breast Cancer Resistance Protein), MRP2 (Multidrug Resistance-associated Protein 2), BSEP (Bile Salt Export Pump), OATP1B1 (Organic Anion Transporting Polypeptide 1B1), OATP1B3 (Organic Anion Transporting Polypeptide 1B3), OCT1 (Organic Cation Transporter 1), OAT1 (Organic Anion Transporter 1), OAT3 (Organic Anion Transporter 3), OCT2 (Organic Cation Transporter 2), MATE1 (Multidrug And Toxin Extrusion Protein 1), and MATE2K (Multidrug and Toxin Extrusion Protein 2-K) at clinically relevant concentrations.

Alpelisib is a substrate for BCRP transporter.

9.2 Drug-Drug Interactions

Effect of PIQRAY on other drugs

CYP2C9 substrates

Co-administration of PIQRAY with CYP2C9 substrates (e.g., warfarin) may reduce plasma concentration of these drugs. Closely monitor when PIQRAY is used in combination with CYP2C9 substrates, where decreases in the plasma concentration of CYP2C9 substrates may reduce activity of these drugs.

CYP3A4 and P-gp substrates

No clinically significant differences in pharmacokinetics of everolimus (a substrate of CYP3A4 and P-gp) were observed when co-administered with alpelisib. The C_{max} of everolimus increased by 11% and the AUC_{0-24} decreased by 11% on co-administration with alpelisib and is not considered clinically meaningful.

Effect of other drugs on PIQRAY

CYP3A4 inducers

Co-administration of PIQRAY with a strong CYP3A4 inducer (e.g., rifampin) may decrease alpelisib concentration, which may decrease alpelisib activity. Avoid co-administration of PIQRAY with strong CYP3A4 inducers.

BCRP inhibitors

Co-administration of PIQRAY with a BCRP inhibitor (e.g., cyclosporine, eltrombopag, lapatinib) may increase alpelisib concentration, which may increase the risk of toxicities. Avoid the use of BCRP inhibitors in patients treated with PIQRAY. If unable to use alternative drugs, closely monitor for increased adverse reactions when PIQRAY is used in combination with BCRP inhibitors.

Acid-reducing agents

PIQRAY can be co-administered with acid reducing agents, since PIQRAY should be taken with food. Food exhibited a more pronounced effect on the solubility of alpelisib than the effect of gastric pH value.

Co-administration of the H_2 receptor-antagonist ranitidine in combination with a single 300 mg oral dose of alpelisib decreased the absorption and overall exposure of alpelisib. In the presence of a low-fat low-calorie meal, AUC was decreased on average by 21% and C_{max} by 36% with ranitidine. Under the fasted state, AUC was decreased on average by 30% and C_{max} by 51% when co-administered with ranitidine based on the results of the clinical study.

Fulvestrant

Clinical study data in patients with breast cancer indicated no effect of fulvestrant on alpelisib exposure (and *vice versa*) following co-administration of these drugs.

Drugs known to cause QTc prolongation

PIQRAY treatment is associated with QT prolongation. An analysis of clinical ECG data showed mean increases from baseline in QTcF were 8.7 ms (90% CI: 4.1, 13.3) in patients treated with PIQRAY at the clinically recommended dose (See ACTION AND CLINICAL PHARMACOLOGY, Pharmacodynamics). Caution should be taken if PIQRAY is used concomitantly with medicinal products that are known to prolong the QTc interval, and perform additional ECG monitoring as clinically indicated.

9.3 Drug-Food Interactions

In healthy patients, co-administration of alpelisib with food resulted in an increased AUC of alpelisib by 77% (10. ACTION AND CLINICAL PHARMACOLOGY and 4. DOSAGE AND ADMINISTRATION).

9.4 Drug-Herb Interactions

Interactions with herbal products have not been established.

9.5 Drug-Laboratory Test Interactions

Interactions with laboratory tests have not been established.

10 ACTION AND CLINICAL PHARMACOLOGY

10.1 Mechanism of Action

Alpelisib is an inhibitor of phosphatidylinositol3kinase (PI3K) with inhibitory activity predominantly against PI3K α . Gain-of-function mutations in the gene encoding the catalytic α -subunit of PI3K (PI3K α encoded by the PIK3CA gene) lead to activation of PI3K α and Akt-signalling, cellular transformation and the generation of tumours in *in vitro* and *in vivo* models. In biochemical assays, alpelisib inhibited wild type PIK3 α (IC₅₀ = 4.6 nmol/L) and its two most common somatic mutations (H1047R, E545K) (IC₅₀ ~ 4 nmol/L) more potently than the PI3K δ (IC₅₀ = 290 nmol/L) and PI3K γ (IC₅₀ = 250 nmol/L) isoforms and showed significantly reduced activity against PI3K β (IC₅₀ = 1156 nmol/L).

In breast cancer cell lines, alpelisib inhibited the phosphorylation of PI3K downstream targets, including Akt, and showed activity in cell lines harbouring a PIK3CA mutation. *In vivo*, alpelisib inhibited the PI3K/Akt signalling pathway and reduced tumour growth in xenograft models, including models of breast cancer. PI3K inhibition by alpelisib treatment has been shown to induce an increase in oestrogen receptor (ER) transcription in breast cancer cells. The combination of alpelisib and fulvestrant demonstrated increased anti-tumour activity compared to either treatment alone in xenograft models derived from ER-positive, PIK3CA-mutated breast cancer cell lines.

10.2 Pharmacodynamics

Hyperglycaemia

Hyperglycaemia is an on-target effect of PI3K signalling pathway inhibition and alpelisib treatment has the potential to interfere with glucose and insulin homeostasis. Alpelisib, at concentrations > 20 µmol/L, produced a concentration-dependent glucose increase which led to hyperglycaemia despite elevation of insulin plasma levels. In non-clinical studies with alpelisib, pancreas was identified as a secondary target organ due to changes in peripheral glucose uptake.

QT_c prolongation

In vitro, the IC₅₀ of alpelisib for the inhibition of hERG transmission was 9.4 µM, using voltage-clamped human embryonic kidney cells (HEK293), which is similar to mean C_{max} (6.8 µM) and ~13-fold higher than the unbound C_{max} (0.71 µM) in patients at the clinically recommended dose (300 mg). No relevant electrophysiological effect was seen in dogs.

A dedicated QT_c study has not been conducted. ECGs were collected in a phase I study to evaluate the effect of alpelisib on the QT_cF interval. In patients administered a 300 mg dose (n = 14), the mean QT_cF change from baseline was 8.7 msec (90% CI: 4.1, 13.3) at the observed C_{max} at steady-state.

10.3 Pharmacokinetics

The pharmacokinetics of alpelisib has been studied in healthy volunteers and adult patients with solid tumours. Steady-state alpelisib maximum plasma concentration (C_{max}) and AUC increased proportionally over the dose range of 30 mg to 450 mg (0.1 to 1.5 times the approved recommended dosage of 300 mg QD) under fed conditions. The mean accumulation of alpelisib is 1.3 to 1.5 fold and steady-state plasma concentrations are reached within 3 days following daily dosage. In adult patients who received PIQRAY 300 mg once daily in the SOLAR-1 trial, mean steady-state alpelisib C_{max} was 2480 ng/mL and AUC_{tau} was 33224 ng*h/mL based on a population approach analysis. The geometric mean AUC_{inf} was reduced by 37% and the C_{max} was comparable in healthy volunteers compared to cancer patients administered alpelisib 300 mg single dose. Alpelisib exhibits low clearance with 9.4 L/hr based on population PK analysis under fed conditions. The population-derived half-life, independent of dose and time, was around 9 hours at steady state of 300 mg, once daily.

Table 10.1 Summary of alpelisib pharmacokinetic parameters¹ in patients with solid tumours (including breast cancer) under fed conditions

Dose	C _{max} (ng/mL) (CV%)	T _{max} (h) (CV%)	t _{1/2} (h) (CV%)	AUC _{tau} (ng*h/mL) (CV%)	CL (L/h) (CV)	Vd (L) (SV%)
300 mg, multiple dose	2480 (23)	4.6 (4)	9 (3.7)	33224 (21)	9.4 (19)	121 (35)

¹ Phase III population PK model estimates and derived PK parameters at 300 mg once daily

Values denote arithmetic mean and median for T_{max}.

Absorption: Following oral administration of alpelisib, median time to reach peak plasma concentration (T_{max}) ranged between 2.0 to 4.0 hours, independent of dose, time or regimen. **Food effect:** Alpelisib absorption is affected by food. Co-administration of a single 300 mg oral dose of alpelisib, with a high-fat high-calorie (HFHC) meal (985 calories with 58.1 g of fat) increased AUC by 73% and C_{max} by 84%, and co-administration with a low-fat low-calorie (LFCL) meal (334 calories with 8.7 g of fat) increased AUC by 77% and C_{max} by 145%. No

significant difference in apelisib AUC was observed between LFLC and HFLC meals (see 4. DOSAGE AND ADMINISTRATION).

Distribution: The mean apparent volume of distribution of apelisib at steady-state (V_{ss}/F) is predicted to be 114 L. Protein binding of apelisib is 89% and is independent of concentration.

Metabolism: Apelisib is primarily metabolised by chemical and enzymatic hydrolysis to form its metabolite BZG791 and to a lesser extent by CYP3A4, *in vitro*. BZG791 accounted for approximately 40-45 % of the dose, CYP3A4-mediated metabolites (12%) and glucuronides amounted to approximately 15% of the dose.

Elimination: Following a single oral dose of 400 mg radiolabelled apelisib under fasted condition, 81% of the administered dose was recovered in faeces (36% unchanged, 32% BZG791) and 14% (2% unchanged, 7.1% BZG791) in urine.

Special Populations and Conditions

Paediatrics (below 18 years): The pharmacokinetics of PIQRAY in paediatric patients have not been established.

Geriatrics (65 years or above): Age had no clinically relevant effect on the pharmacokinetics of apelisib based on population pharmacokinetic analysis. The CL of apelisib decreased by 5% for patients 10 years older than average, with a median age of 62 years (range 25 to 87 years) based on population pharmacokinetic analysis of the phase III clinical data (see 7. WARNINGS AND PRECAUTIONS, Special Populations, Geriatrics).

Gender

Gender had no clinically relevant effect on the pharmacokinetics of apelisib based on the population pharmacokinetic analysis. The $AUC_{0-24, ss}$ in males were lower by 25% compared to females, based on population pharmacokinetic analysis.

Body Weight

Body weight had no clinically relevant effect on the pharmacokinetics of apelisib based on the population pharmacokinetic analysis. Compared to the typical patient weighing 67 kg, for a patient weighing 50 or 90 kg, $AUC_{0-24, ss}$ was estimated to be higher by 20% or lower by 17%, respectively.

Race/Ethnicity: Race had no clinically relevant effect on the pharmacokinetics of apelisib based on the population pharmacokinetic analysis and a single agent study in Japanese cancer patients. The C_{max} were higher by 19% in Japanese patients compared to non-Japanese patients, while the AUC's were comparable based on a population pharmacokinetic analysis (see 7. WARNINGS AND PRECAUTIONS, Special Populations, Race).

Hepatic Impairment: In patients with moderate (Child-Pugh B) and severe hepatic impairment (Child-Pugh C) administered a single dose of apelisib 300 mg QD, the total AUC_{inf} and C_{max} of apelisib decreased by approximately 27% and 17% and the unbound AUC_{inf} and C_{max} decreased by 20% and 15% in patients with moderate hepatic impairment compared to patients with normal hepatic function. The total AUC_{inf} and C_{max} of apelisib increased by approximately 25% and 0%, and the unbound AUC_{inf} and C_{max} increased by 73% and 36% in patients with severe hepatic impairment compared to patients with normal hepatic function, based on the results of a hepatic impairment study in non-cancer patients. Mild hepatic impairment (Child-Pugh A) had no clinically relevant effect on the pharmacokinetics of apelisib based on the population pharmacokinetic analysis (see 4. DOSAGE AND ADMINISTRATION).

Renal Impairment: Based on a population pharmacokinetic analysis that included 117 patients

with normal renal function (eGFR \geq 90 mL/min/1.73 m²)/(CL_{cr} \geq 90 mL/min), 108 patients with mild renal impairment (eGFR 60 to < 90 mL/min/1.73 m²)/(CL_{cr} 60 to < 90 mL/min), and 45 patients with moderate renal impairment (eGFR 30 to < 60 mL/min/1.73 m²), the AUC_{0-24, ss} of alpelisib increased by 2% and 8% in patients with mild and moderate renal impairment compared to patients with normal renal function. These increases in exposures are not considered clinically relevant. The effect of severe renal impairment (eGFR < 30 mL/min/1.73 m²) on alpelisib pharmacokinetics is unknown (see 4. DOSAGE AND ADMINISTRATION).

Genetic Polymorphism: The effects of genetic polymorphism on the pharmacokinetics of alpelisib have not been evaluated.

11 STORAGE, STABILITY AND DISPOSAL

Do not store above 30°C. Store in the original package to protect from moisture.

PIQRAY must be kept out of the reach and sight of children.

12 SPECIAL HANDLING INSTRUCTIONS

Not applicable.

PART II: SCIENTIFIC INFORMATION

13 PHARMACEUTICAL INFORMATION

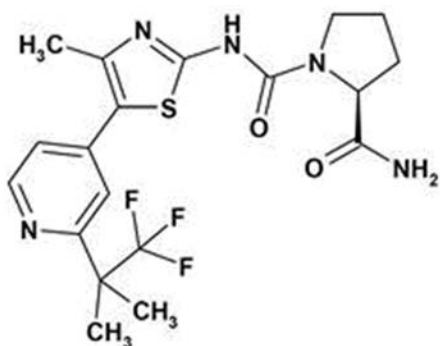
Drug Substance

Proper/Common name: Alpelisib

Chemical name: (2S)-1-N-{4-Methyl-5- [2-(1,1,1-trifluoro-2-methylpropan-2-yl)pyridin-4-yl]-1,3-thiazol-2-yl} pyrrolidine-1,2-dicarboxamide

Molecular formula and molecular mass: C₁₉H₂₂F₃N₅O₂S
441.47

Structural formula:



Physicochemical properties: White to practically white powder
pH dependent solubility: soluble in low (acidic) pHs and insoluble in high (alkaline) pHs

Solvent	Solubility (mg/mL)
Water	0.02
pH 1.0 (HCl 0.1 N)	3.64
pH 2.0 (HCl 0.01 N)	0.42
Buffer pH 4.0 (acetate)	0.03
Buffer pH 5.0 (acetate)	0.02
Buffer pH 6.8 (phosphate)	0.02

14 CLINICAL TRIALS

14.1 Trial Design and Study Demographics

PIQRAY was evaluated in a pivotal phase III, randomized, double-blind, placebo-controlled study (SOLAR-1) of PIQRAY in combination with fulvestrant in men and postmenopausal women with hormone receptor (HR) positive, human epidermal growth factor receptor 2 (HER2) negative locally advanced or metastatic breast cancer whose disease had progressed or recurred on or after an endocrine-based treatment. Patients with inflammatory breast cancer, symptomatic visceral disease, prior treatment of chemotherapy, or concurrently using other anticancer therapy, active CNS metastases, diabetes mellitus type I or uncontrolled type II, or clinically significant, uncontrolled heart disease and/or recent cardiac events (including long QT syndrome, QTcF > 450 ms for males or > 460 ms for females) at baseline were excluded.

Based on PIK3CA mutation tests using tumour tissue, a total of 572 HR-positive, HER2-negative patients were enrolled into two cohorts: PIK3CA mutation cohort or PIK3CA non-mutation cohort. PIK3CA mutation status in Exons 7, 9 and 20 (Exon 7: C420R; Exon 9: E542K, E545A, E545D [1635G>T only], E545G, E545K, Q546E, Q546R; and Exon 20: H1047L, H1047R, H1047Y) was determined by a validated real-time PCR sequencing assay. Overall, 60% of enrolled patients (n = 341) had tumours with one or more PIK3CA mutations and 40% (n = 231) had tumours without a PIK3CA mutation.

In each cohort, patients were randomized to receive either PIQRAY 300 mg plus fulvestrant or placebo plus fulvestrant in a 1:1 ratio. Randomization was stratified by presence of lung and/or liver metastasis and previous treatment with CDK4/6 inhibitor(s).

Of the 341 patients in the PIK3CA mutation cohort, overall demographics and baseline disease characteristics, ECOG performance status, tumour burden, and prior antineoplastic therapy were generally well balanced between the study arms (see Table 14.1). At baseline, 98% of patients had stage IV disease and 69% had < 3 metastatic sites. The majority of patients (74%) had bone metastases with or without other metastases at baseline, 23% having only bone metastases and 50% having liver/lung metastases.

The majority of patients (98%) received prior hormonal therapy as the last treatment (48% metastatic setting, 52% adjuvant setting), and 6% had previously been treated with a CDK4/6 inhibitor. Primary endocrine resistance, defined as relapsed within 24 months on adjuvant endocrine therapy or progression within 6 months on endocrine therapy for advanced disease, was observed in 13% of patients and secondary endocrine resistance, defined as relapsed after 24 months on adjuvant endocrine therapy, relapsed within 12 months of the end of adjuvant endocrine therapy, or progression after 6 months on endocrine therapy for advanced disease, was observed in 72% of patients.

Table 14.1 Summary of patient demographics and baseline disease characteristics in the PIK3CA-mutant cohort in SOLAR-1 (Full Analysis Set)

Demographic and disease characteristic variable	Alpelisib + fulvestrant N=169 n (%)	Placebo + fulvestrant N=172 n (%)	All Patients N=341 n (%)
Age (years)			
Median (Range)	63.0 (25 – 87)	64.0 (38 – 92)	63.0 (25 – 92)
Age category (years)			
18 to < 65	95 (56.2)	89 (51.7)	184 (54.0)
≥ 65	74 (43.8)	83 (48.3)	157 (46.0)
Sex			
Female	168 (99.4)	172 (100)	340 (99.7)
Male	1 (0.6)	0	1 (0.3)
Race			
White	117 (69.2)	109 (63.4)	226 (66.3)
Asian	34 (20.1)	40 (23.3)	74 (21.7)
Black or African American	1 (0.6)	3 (1.7)	4 (1.2)

Demographic and disease characteristic variable	Alpelisib + fulvestrant N=169 n (%)	Placebo + fulvestrant N=172 n (%)	All Patients N=341 n (%)
Other	8 (4.7)	10 (5.8)	18 (5.3)
ECOG performance status			
0	112 (66.3)	113 (65.7)	225 (66.0)
1	56 (33.1)	58 (33.7)	114 (33.4)
Missing	1 (0.6)	1 (0.6)	2 (0.6)
Stratum at randomisation			
Presence of lung and/or liver metastases	84 (49.7)	86 (50.0)	170 (49.9)
Prior CDK4/6 inhibitor	9 (5.3)	11 (6.4)	20 (5.9)
Last prior hormonal therapy			
Aromatase inhibitors	165 (97.6)	168 (97.7)	333 (97.7)
Anti-oestrogen therapy	25 (14.8)	29 (16.9)	54 (15.8)
Setting at last hormonal therapy			
Adjuvant	88 (52.1)	89 (51.7)	177 (51.9)
Therapeutic (Metastatic)	80 (47.3)	83 (48.3)	163 (47.8)
Endocrine resistance			
Primary ¹	23 (13.6)	22 (12.8)	45 (13.2)
Secondary ²	120 (71.0)	127 (73.8)	247 (72.4)

Last hormonal therapy refers to hormonal medication received in the last regimen

Primary and secondary resistance as per ESMO definition

¹Relapse < 24 months while on endocrine therapy (ET) in adjuvant setting or progression < 6 months while on ET in metastatic setting

²Relapse ≥ 24 months while on ET in adjuvant setting or relapse < 12 months after end of ET in adjuvant setting or progression ≥ 6 months while on ET in metastatic setting

PIQRAY 300 mg or matching placebo was administered orally once daily on a continuous basis. Fulvestrant 500 mg was administered intramuscularly on Cycle 1 Day 1 and 15 and then at Day 1 of a 28-day cycle (administration +/- 3 days). Patients were not allowed to cross over from placebo to PIQRAY during the study or after disease progression. Patients were treated until disease progression or unacceptable toxicity. Overall, the median treatment duration was 8.2 months in the PIQRAY plus fulvestrant arm and 5.6 months in the placebo plus fulvestrant arm. The median study follow-up in the PIK3CA mutation cohort was 20 months.

The primary endpoint for the study was progression-free survival (PFS) in patients with PIK3CA mutation based on the investigator assessment using Response Evaluation Criteria in Solid Tumors (RECIST v1.1). The key secondary endpoint was overall survival (OS) for patients with PIK3CA mutation status. Other secondary endpoints included PFS and OS for patients without PIK3CA mutation, overall response rate (ORR) and clinical benefit rate (CBR) for patients with and without PIK3CA mutation.

14.2 Study Results

The efficacy results in the PIK3CA mutation cohort demonstrated a statistically significant improvement in PFS in patients receiving PIQRAY plus fulvestrant, compared to patients receiving placebo plus fulvestrant. There was an estimated 35% risk reduction of disease progression or death in the PIQRAY plus fulvestrant arm compared with the placebo plus fulvestrant arm (see Table 14-2 and Figure 14-1).

PFS results were supported by the results from a blinded independent review committee (BIRC) assessment in a randomly selected subset of approximately 50% of the patients in this cohort. Results were consistent across subgroups including stratification factors, major demographics, previous therapy and other prognostic factors, such as lung/liver metastases and bone lesions only (Figure 14-2).

At the time of final PFS analysis, overall survival was not mature with 92 (27%) deaths reported. The pre-specified O'Brien-Fleming stopping boundary was not crossed at the first interim OS analysis (see Table 14-2).

A PFS benefit was not demonstrated in the cohort of patients without a PIK3CA mutation (HR = 0.85; 95% CI: 0.58, 1.25, one-sided p = 0.21). Therefore, PIQRAY is not recommended for use in this patient population.

Table 14-2 Summary of efficacy results based on RECIST 1.1 criteria, in the cohort of patients with PIK3CA mutation, per investigator assessment in SOLAR-1

	PIQRAY plus fulvestrant	Placebo plus fulvestrant
	N = 169	N = 172
Primary endpoint		
Progression-free survival		
Number of PFS events – n (%)	103 (60.9)	129 (75.0)
Progressive disease	99 (58.6)	120 (69.8)
Death	4 (2.4)	9 (5.2)
Median PFS – months (95% CI)	11.0 (7.5, 14.5)	5.7 (3.7, 7.4)
Hazard ratio (95% CI) ¹	0.65 (0.50, 0.85)	
One-sided p-value ¹	0.00065	
Secondary endpoints		
Overall survival		
Number of OS events – n (%)	40 (23.7)	52 (30.2)
Median OS – months (95% CI)	NE (28.1, NE)	26.9 (21.9, NE)
Hazard ratio (95% CI) ¹	0.73 (0.48, 1.10)	
Overall Response Rate		
Full analysis set	N = 169	N = 172
ORR ² (95% CI)	26.6 (20.1, 34.0)	12.8 (8.2, 18.7)
CBR ⁴ (95% CI)	61.5 (53.8, 68.9)	45.3 (37.8, 53.1)

Patients with measurable disease at baseline

N = 126

N = 136

ORR² (95% CI)

35.7 (27.4, 44.7)

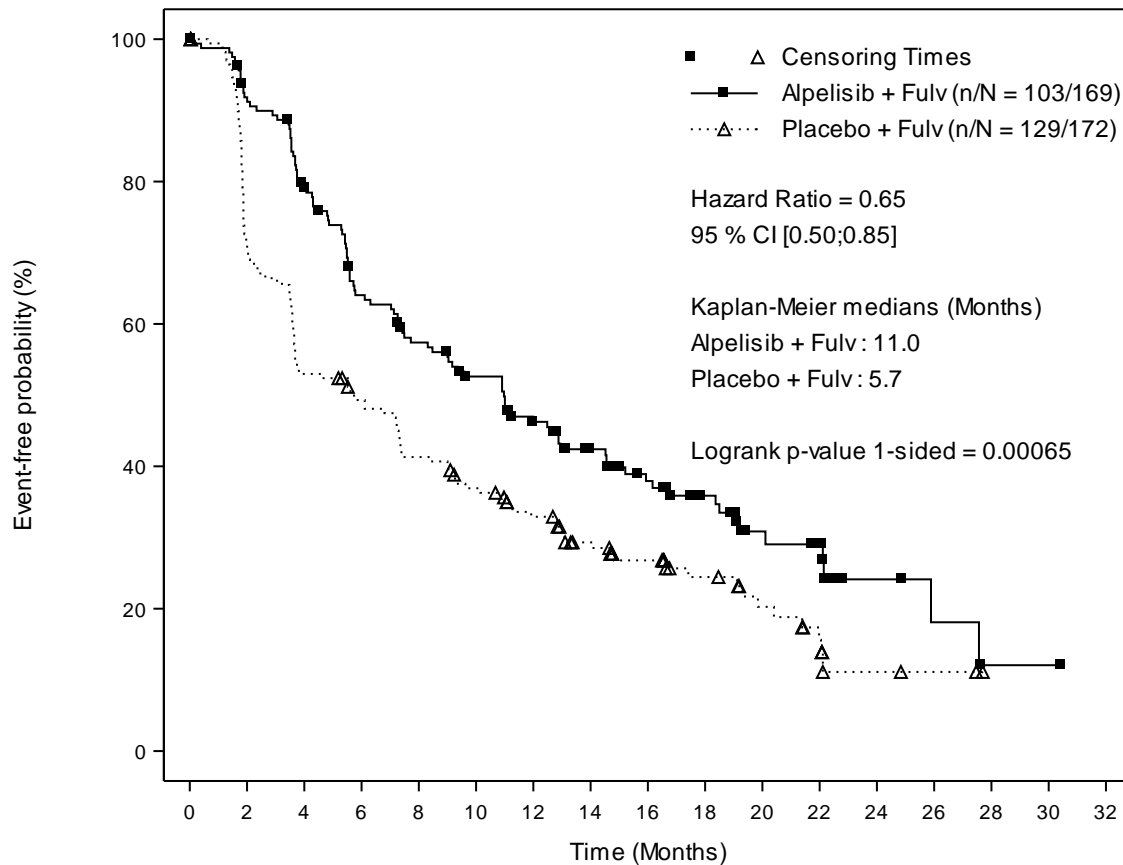
16.2 (10.4, 23.5)

¹ Both log-rank test and Cox proportional hazards model are stratified by prior CDK4/6 inhibitor usage and presence of lung/liver metastases. P-value from log-rank test was compared to pre-specified Haybittle-Peto stopping boundary (one-sided $p \leq 0.0199$).

² ORR (Overall Response Rate) = percentage of patients with confirmed Complete Response or Partial Response

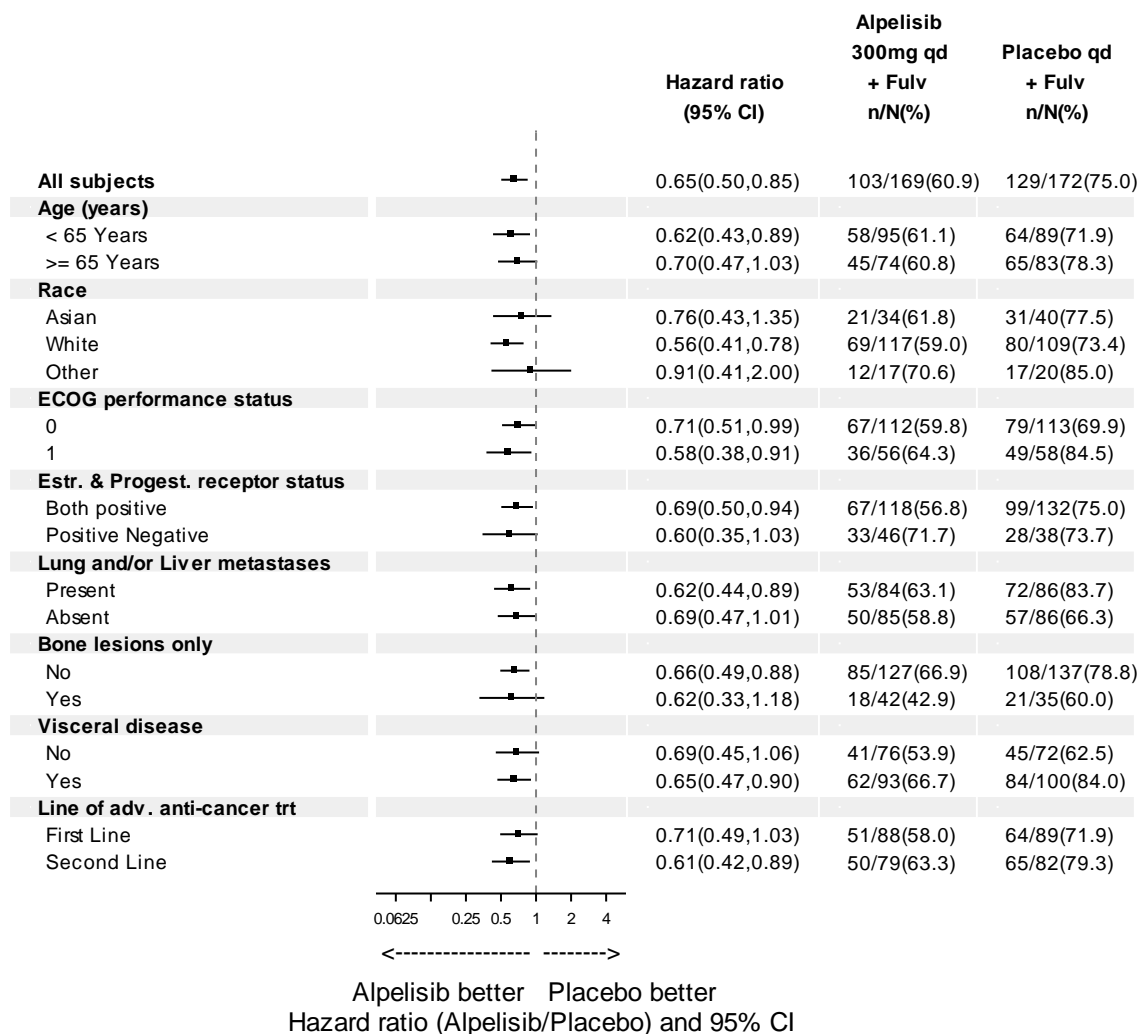
³ CBR (Clinical Benefit Rate) = proportion of patients with confirmed Complete Response or Partial Response, or Stable Disease or Non-Complete Response/Non-Progression Disease ≥ 24 weeks

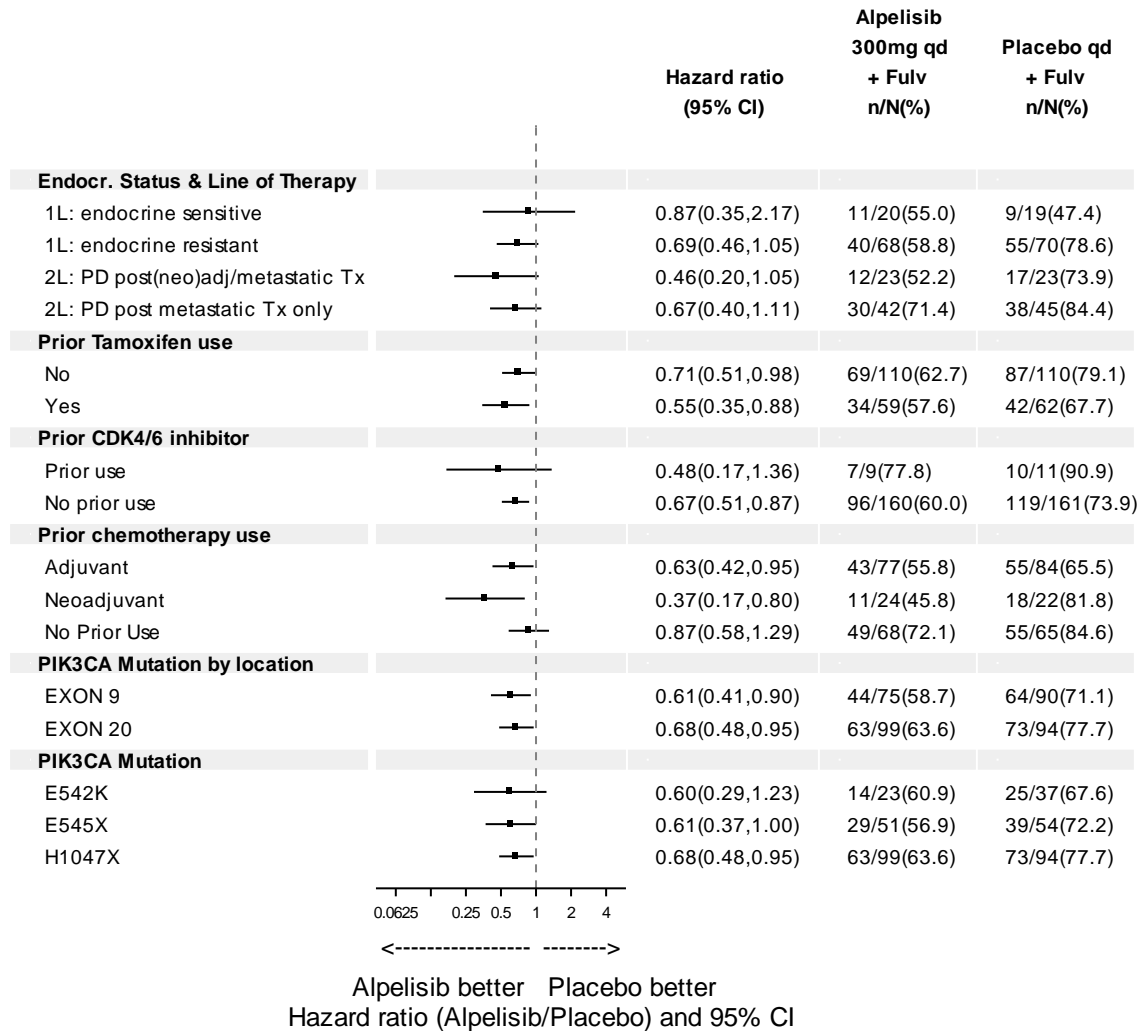
Figure 14-1 Kaplan-Meier Progression Free Survival (PFS) curve in the cohort of patients with PIK3CA mutation per local investigator assessment in SOLAR-1



Time (Months)	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
Number of subjects still at risk																	
Alpelisib + Fulv	169	145	123	97	85	75	62	50	39	30	17	14	5	3	1	1	0
Placebo + Fulv	172	120	89	80	67	58	48	37	29	20	14	9	3	2	0	0	0

Figure 14-2 Forest plot of PFS based on investigator review in the cohort of patients with PIK3CA mutation in SOLAR-1





X denotes multiple amino acid changes possible; E545X (E545A, E545D, E545G, E545K), H1047X (H1047Y, H1047R, H1047L)

15 MICROBIOLOGY

Not applicable.

16 NON-CLINICAL TOXICOLOGY

Alpelisib was evaluated in safety pharmacology, single- and repeated dose toxicity, genotoxicity and photo-toxicity studies.

General toxicology

Repeat dose-toxicity studies revealed that the majority of the observed alpelisib effects were related to the pharmacological activity of alpelisib as a p110 α specific inhibitor of the PI3K pathway, such as the influence on the glucose homeostasis resulting in hyperglycaemia and the risk of increased blood pressure.

Bone marrow and hematopoietic and lymphopoietic organs, pancreas, reproductive organs of both genders and mucosal tissues of the alimentary tract were the main target organs for

adverse effects, which were generally reversible upon cessation of treatment.

Carcinogenicity

Carcinogenicity studies have not been conducted with alpelisib.

Genotoxicity

Alpelisib was not mutagenic in a *bacterial reverse mutation (Ames)*, or aneugenic or clastogenic in human cell micronucleus and chromosome aberration tests *in vitro*, and it was not genotoxic in an *in vivo* rat micronucleus test.

Reproductive and developmental toxicity

Embryo-foetal development studies

In embryo-foetal development studies in rats and rabbits, pregnant animals received oral doses of alpelisib up to 30 mg/kg/day, during the period of organogenesis.

In rats, oral administration of alpelisib was associated with maternal body weight loss or stagnation, low food consumption and embryonal death at 30 mg/kg/day, at approximately 3.2 times (based on AUC) the exposure in humans at the highest recommended dose of 300 mg. Low maternal body weight gain, increased incidences of enlarged brain ventricle in the foetuses, reduced foetal weight, decreased bone ossification and skeletal malformations were seen at 10 mg/kg/day, which is equal to approximately 0.9 times below the exposure in humans at the highest recommended dose.

In rabbits, at doses of ≥ 25 mg/kg/day, maternal body weight loss with reduced food intake was observed. At 15 mg/kg/day, slight transient body weight loss was observed. At ≥ 15 mg/kg/day, increased embryo-foetal deaths and malformations were observed, mostly related to the tail and head, and were associated with increased serum glucose levels in dams. At 25 mg/kg/day, reduced mean foetal weight was observed. The dose of 15 mg/kg/day dose in rabbits is equivalent to approximately 5.5 times (based on AUC) the exposure achieved at the highest recommended human dose.

Fertility studies

Fertility studies in animals have not been conducted. In repeated-dose toxicity studies up to 13 weeks duration, adverse effects were observed in reproductive organs of males and females, including vaginal atrophy and oestrus cycle variations in rats at doses ≥ 6 mg/kg/day (approximately 0.5 times the exposure in humans at the recommended dose of 300 mg/day based on AUC), and prostate atrophy in dogs at doses ≥ 15 mg/kg/day (approximately 2.8 times the exposure in humans at the recommended dose of 300 mg/day based on AUC).

Phototoxicity

An *in vitro* phototoxicity test on the mouse Balb/c 3T3 fibroblast cell line did not identify a relevant phototoxicity potential for alpelisib.

Juvenile animal studies

No juvenile toxicity studies have been conducted.

READ THIS FOR SAFE AND EFFECTIVE USE OF YOUR MEDICINE
PATIENT MEDICATION INFORMATION

PrPIQRAY®
alpelisib

Read this carefully before you start taking **PIQRAY®** and each time you get a refill. This leaflet is a summary and will not tell you everything about this drug. Talk to your healthcare professional about your medical condition and treatment and ask if there is any new information about **PIQRAY**.

Your breast cancer will be treated with PIQRAY in combination with another drug called fulvestrant. Read the Patient Medication Information leaflets for the other drug as well as this one.

Serious Warnings and Precautions

Take PIQRAY only under the care of a doctor who knows how to use anti-cancer drugs.

PIQRAY can cause:

- serious allergic reactions (anaphylactic reactions)
- serious skin problems
 - Stevens-Johnson syndrome (severe skin rash)
 - Drug reaction with eosinophilia and systemic symptoms (DRESS): serious skin reaction that may affect one or more organs
 - Erythema Multiforme (allergic skin reaction)
- high levels of:
 - blood sugar (hyperglycaemia)
 - blood acids (diabetic ketoacidosis)
- lung problems (pneumonitis)

The symptoms are listed in the 'Serious side effects and what to do about them' table. It is found later in this leaflet.

What is PIQRAY used for?

PIQRAY is used to treat breast cancer, which has spread to other parts of the body, in post-menopausal women and in men. The breast cancer must be hormone receptor-positive and with a specific gene mutation (PIK3CA). PIQRAY is used:

- with another drug for breast cancer called fulvestrant. This is used when the cancer gets worse after other therapies.

How does PIQRAY work?

Alpelisib, the medicinal ingredient in PIQRAY, is a type of drug called a kinase inhibitor. It works by stopping certain cancer cells from dividing and growing. When given together with fulvestrant, PIQRAY may slow down the growth and spread of certain breast cancer cells.

What are the ingredients in PIQRAY?

Medicinal ingredients: alpelisib

Non-medicinal ingredients: hypromellose, magnesium stearate, mannitol, microcrystalline cellulose, sodium starch glycolate, iron oxide black, iron oxide red, macrogol / polyethylene glycol (PEG), talc, titanium dioxide.

PIQRAY comes in the following dosage forms:

50 mg, 150 mg and 200 mg alpelisib tablets

Do not use PIQRAY if:

- you are allergic to alpelisib or to any of the other ingredients in this drug or the container.

To help avoid side effects and ensure proper use, talk to your healthcare professional before you take PIQRAY. Talk about any health conditions or problems you may have, including if you:

- have or ever had diabetes or if you are pre-diabetic (high blood sugar levels)
- have or ever had serious skin problems like:
 - Stevens-Johnson syndrome (SJS), a type of severe skin rash
 - Drug reaction with eosinophilia and systemic symptoms (DRESS), a type of serious skin reaction that may affect one or more organs
 - Erythema multiforme (EM), allergic skin reaction
- have or ever had osteonecrosis of the jaw (exposed jaw bone)

Other warnings you should know about

- **Severe diarrhoea, nausea and vomiting** can occur while taking PIQRAY
- **Serious allergic reaction (anaphylactic reaction/shock)** like trouble breathing, flushing, rash, fever, or fast heart rate can occur while taking PIQRAY
- **Lung problems (pneumonitis)** such as shortness of breath or trouble breathing, cough or chest pain can occur while taking PIQRAY
 - Stop taking the drug and get medical help right away if you have any new or worsening symptoms.

Pregnancy, breast-feeding and fertility

Female patients

- Do not use PIQRAY if you are pregnant or if you are still able to get pregnant and are not using highly effective birth control.
- Use highly effective birth control if you can get pregnant while taking PIQRAY and for at least 1 week after your last dose.
- Avoid becoming pregnant while taking PIQRAY. It may harm your unborn baby.
- Tell your healthcare professional right away if you become pregnant or think you are pregnant during treatment with PIQRAY.
- If you can get pregnant, your healthcare provider should do a pregnancy test before you start treatment with PIQRAY.
- It is not known if PIQRAY passes into breast milk. Do not breastfeed during treatment with PIQRAY and for at least 1 week after the final dose. Talk to your healthcare professional about the best way to feed your baby during this time.

Male patients

- Use highly effective birth control while you are on PIQRAY and for at least 1 week after your last dose if:
 - your partner is pregnant, might be pregnant or can get pregnant
- Do not donate or store semen while you are on PIQRAY and for at least 1 week after your last dose.

Other patient groups:

- **Children under 18 years old** should not be given PIQRAY.
- **Adults 65 years and older** might get more certain side effects:
 - diarrhoea, nausea, weight loss, shortness of breath, low potassium and high blood sugar levels.
- **Asians** might get more certain side effects:
 - severe skin and allergic reactions, rash.

Tell your healthcare professional about all the medicines you take, including any drugs, vitamins, minerals, natural supplements or alternative medicines.

The following may interact with PIQRAY:

- eltrombopag - used to treat low blood platelet count
- lapatinib - used to treat certain types of breast cancers
- pantoprazole - used to reduce the amount of acid produced in your stomach or heart burn
- ranitidine – used to treat heartburn
- cyclosporine – used to prevent organ transplant rejection
- rifampin - used to treat lung disease
- warfarin - used to treat blood clots
- medicines that can increase QT interval (a heart rhythm condition) including, but not limited to:
 - ondansetron – used to prevent nausea and vomiting
 - erythromycin, clarithromycin, azithromycin, moxifloxacin, levofloxacin, ciprofloxacin – used to treat bacterial infections (antibiotics)
- medicines used to treat diabetes. Always follow your healthcare professional's instructions on how to take these medicines with PIQRAY.

Ask your healthcare professional if you are not sure whether your drug is listed above.

Tell your healthcare professional if you are prescribed any new drugs during PIQRAY treatment.

How to take PIQRAY:

- Take PIQRAY exactly as your healthcare professional tells you. Another drug called fulvestrant is also given to you while you are taking PIQRAY.
- Take PIQRAY once a day, at the same time, immediately following food.
- Swallow PIQRAY tablets whole. Do not chew, crush or split the tablets.
- Do not take PIQRAY tablets that are broken, cracked or look damaged.
- If you vomit after taking a dose of PIQRAY, do not take another dose on that day. Take your next dose at your regular time.
- Do not take more than the recommended dose prescribed by your healthcare professional.
- Do not change the PIQRAY dose or schedule unless your healthcare professional tells you to.
- Your healthcare professional will monitor your health. They may reduce, interrupt, or stop your PIQRAY dose. This may occur based on your current health, if you take certain other medications, or if you have certain side effects.

Recommended daily dose**Adults:**

- **300 mg starting dose:** Two 150 mg tablets once daily

Reduced recommended daily dose

Adults:

- **250 mg daily dose:** One 200 mg tablet and one 50 mg tablet, once daily
- **200 mg daily dose:** One 200 mg tablet once daily

Overdose:

If you think you have taken too much PIQRAY, contact your healthcare professional, hospital emergency department or regional poison control centre immediately, even if you have no symptoms.

Show the PIQRAY packet. Medical treatment may be necessary.

Missed dose:

- If you are less than 9 hours late, take the missed dose, after food, as soon as you remember. Take the next dose at your regular time.
- If you are more than 9 hours late, skip the dose for that day. Wait until the regular time for your next dose.
- Do not take two doses to make up for a missed dose.

What are possible side effects from using PIQRAY?

These are not all the possible side effects you may feel when taking PIQRAY. If you experience any side effects not listed here, contact your healthcare professional.

Side effects may include:

- Headache
- Tiredness, difficulty to sleep
- Changes in the way food tastes
- Decreased appetite
- Indigestion
- Toothache, gum pain
- Cracked, chapped lips
- Dry, cracked skin
- Blurred vision, dry eyes
- Muscle pain
- Hair loss

PIQRAY can cause abnormal blood test results. Your healthcare professional will order some tests before and during your treatment. These include blood tests to monitor the blood sugar level and electrolytes (potassium, calcium) in your body. More frequent blood tests might be needed. Your healthcare professional will tell you if your test results are abnormal and if you need treatment to correct these side effects.

Serious side effects and what to do about them			
Symptom / effect	Talk to your health care professional		Stop taking drug and get immediate medical help
	Only if severe	In all cases	
VERY COMMON			

Serious side effects and what to do about them			
Symptom / effect	Talk to your health care professional		Stop taking drug and get immediate medical help
	Only if severe	In all cases	
Acute Kidney Injury (severe kidney problems): urinating less than usual or a lower amount of urine than usual, swelling in legs, ankles, and around the eyes, tiredness, confusion, nausea, seizure, chest pain			√
Anaemia: (low levels of red blood cells): tiredness, weakness, fatigue, pale skin	√		
Gastrointestinal disorders: diarrhoea, nausea, vomiting, stomach pain, decreased appetite, heartburn, swelling or bloating of the abdomen, indigestion	√		
Hyperglycaemia (high blood sugar): increased thirst, frequent urination, larger amounts of urine, increased appetite with weight loss		√	
Stomatitis (mouth sores, inflammation of the mouth) or Mucosal Inflammation (inflammation of the moist body surfaces): red, sore or swollen mouth, lips, gums	√		
Urinary Tract Infection (infection in the urinary system): painful and frequent urination, pelvic pain, strong smelling urine, cloudy urine		√	
COMMON			
Dehydration (when there is not enough water in the body): thirst; reduced sweating and urine; dry mouth	√		
Erythema Multiforme (allergic skin reaction): raised red or purple skin patches, possibly with blister or crust in the centre, possibly with mild itching or burning; possibly swollen lips			√
Hypertension (high blood pressure): headache, fatigue, dizziness, tinnitus, cold swelling, nosebleed, racing pulse or heart palpitations, shortness of breath	√		
Hypocalcaemia (low levels of calcium in blood): cramps	√		
Hypokalaemia (low levels of potassium in blood): muscle weakness and spasms, irregular heartbeats	√		

Serious side effects and what to do about them			
Symptom / effect	Talk to your health care professional		Stop taking drug and get immediate medical help
	Only if severe	In all cases	
Lymphopenia (low white blood cells): fever; cough; runny nose; enlarged lymph nodes; painful joints; rash; night sweats; weight loss	√		
Osteonecrosis of the Jaw (exposed jaw bone): pain, swelling, numbness or heavy feeling of the jaw, or loosening of a tooth		√	
Palmar-plantar erythrodysesthesia syndrome (also called Hand-Foot Syndrome: reddening and/or swelling, peeling on the palms and soles, tingling sensation and burning pain of the feet)		√	
Pneumonitis (lung inflammation): difficult, painful, rapid breathing, cough, pain in chest while breathing, blue discoloration of the lips, tongue or skin, or hiccups			√
Serious Allergic Reactions: rash with red bumps, fever, itching, general swelling (including face), shortness of breath, irregular heartbeat			√
Thrombocytopenia (low platelet count): spontaneous bleeding or bruising		√	
UNCOMMON			
Ketoacidosis (high level of acids in the blood): difficulty breathing, nausea, vomiting			√
Pancreatitis (inflamed pancreas): severe upper stomach pain			√
Stevens Johnson Syndrome (severe skin reaction): redness, blistering and/or peeling of the skin and/or inside of the lips, eyes, mouth, nasal passages or genitals, accompanied by fever, chills, headache, cough, body aches or swollen glands			√
UNKNOWN			

Serious side effects and what to do about them			
Symptom / effect	Talk to your health care professional		Stop taking drug and get immediate medical help
	Only if severe	In all cases	
Drug reaction with eosinophilia and systemic symptoms (DRESS) (serious skin reaction that may affect more than one or more organs): fever, severe rash, swollen lymph glands, flu-like feeling, swelling of the face; possibly yellow skin or eyes, shortness of breath, dry cough, chest pain or discomfort, feel thirsty, urinate less often, less urine			√

If you have a troublesome symptom or side effect that is not listed here or becomes bad enough to interfere with your daily activities, talk to your healthcare professional.

<p>Reporting Side Effects</p> <p>You can report any suspected side effects associated with the use of health products to Health Canada by:</p> <ul style="list-style-type: none"> • Visiting the Web page on Adverse Reaction Reporting (https://www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/adverse-reaction-reporting.html) for information on how to report online, by mail or by fax; or • Calling toll-free at 1-866-234-2345. <p><i>NOTE: Contact your health professional if you need information about how to manage your side effects. The Canada Vigilance Program does not provide medical advice.</i></p>

Storage:

- Do not store above 30°C
- Do not take this medicine after the expiry date, which is stated on the box
- Keep in the original package. Protect from moisture.

Keep out of reach and sight of children.

Ask your pharmacist how to dispose of medicines you no longer use.

If you want more information about PIQRAY:

- Talk to your healthcare professional
- Find the full product monograph that is prepared for healthcare professionals and includes this Patient Medication Information by visiting the Health Canada website (<http://hc-sc.gc.ca/index-eng.php>); the manufacturer's website (www.novartis.ca), or by calling 1-800-363-8883.

This leaflet was prepared by Novartis Pharmaceuticals Canada Inc.

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PIQRAY is a registered trademark